Department of Agriculture, Environment and Rural Affairs

794-NI-WAE-02384 | Wildlife Intervention Options as part of the Bovine Tuberculosis in Northern Ireland Blueprint for Eradication

SEA Environmental Report

794-NI-WAE-02384

F01

01 June 2026

TETRA TECH

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Document status

Document status					
Version	**Purpose of document**	**Authored by**	**Reviewed by**	**Approved by**	**Date**
D01	Internal review	Dr Emma Hayes	Dr Louise Donohue	Grace Glasgow	19/05/26
D02	Draft for client review	Dr Louise Donohue Dr Emma Hayes	Richard Bingham	Grace Glasgow	25/05/26
F01	Post client review	Dr Louise Donohue Dr Emma Hayes	Richard Bingham	Grace Glasgow	01/06/26

Approval for issue		
Grace Glasgow		01/06/26

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Abbreviations

AA	Appropriate Assessment
AQMAs	Air Quality Management Areas
ASSIs	Areas of Special Scientific Interest
BCG	Bacillus Calmette-Guérin
bTB	Bovine Tuberculosis
CITT	Comparative Intradermal Tuberculin Test
CVO	Chief Veterinary Officer
DAERA	Department of Agriculture, Environment and Rural Affairs
DAFM	Department of Agriculture, Food and the Marine
DCEE	Department of the Climate, Energy and the Environment
DHLGH	Department of Housing, Local Government and Heritage
EPA	Environmental Protection Agency
EU	European Union
GHG	Greenhouse Gas
HRA	Habitats Regulations Assessment
IFNg	Interferon Gamma
LBAPs	Local Biodiversity Action Plans
LDP	Local Development Plan
MCZs	Marine Conservation Zones
NBRBD	Neagh Bann River Basin District
NERBD	North Eastern River Basin District
NIEA	Northern Ireland Environment Agency
NI	Northern Ireland
NISRA	Northern Ireland Statistics and Research Agency
NNRs	National Nature Reserves
OTF	Officially Tuberculosis Free
OTS	Officially Tuberculosis Free Status Suspended
OTW	Officially Tuberculosis Free Status Withdrawn
pNHAs	Proposed Natural Heritage Areas
RBMP	River Basin Management Plan
RBD	River Basin District
RTA	Road Traffic Accident
SACs	Special Areas of Conservation
SEA	Strategic Environmental Assessment
SEOs	Strategic Environmental Objectives
SLNCIs	Sites of Local Nature Conservation Importance
SPA	Special Protection Area
SWPAs	Shellfish Water Protected Areas
TBPSG	TB Partnership Steering Group
TBSPG	TB Strategic Partnership Group
TVR	Test and Vaccinate or Remove
WFD	Water Framework Directive
WHS	World Heritage Site

Non-Technical Summary

Introduction

Bovine Tuberculosis (bTB) is a bacterial infection primarily caused by *Mycobacterium bovis* (*M. bovis*). It is a notifiable animal disease, meaning that law requires it to be reported to government authorities. Bovine TB is an issue as it is infectious across a range of farm and wild animals, the control and eradication of the disease within the cattle population is difficult, and the disease currently represents a significant burden upon the farming community. Northern Ireland has had a programme for the eradication and control of bTB in place since the late 1950s. The current bTB programme is required by the European Parliament and Council (2016) Regulation (EU) 2016/429 on the Animal Health Law, under the Tuberculosis Control Order (Northern Ireland) 1999 (as amended) and the Tuberculosis (Examination and Testing) Scheme (Northern Ireland) 1999 (as amended). This programme enables the trading of livestock from Northern Ireland within the European Union and internationally.

In 2022, the Department for Agriculture, Environment and Rural Affairs (DAERA) published a Bovine Tuberculosis Eradication Strategy for Northern Ireland, which outlined 27 actions with the aim to eradicate bovine TB by 2050. In October 2023, a judicial review overturned the wildlife intervention measure included in the Strategy. Since this time, the Bovine TB Blueprint has been developed, which has further advanced and updated the Eradication Strategy. The Blueprint outlines 34 actions across three key themes of People, Cattle and Wildlife with the aim to eradicate bTB by 2050.

The Strategic Environmental Assessment (SEA) Directive (2001/42/EC) requires that the environment is considered during the preparation of Plans and Programmes. This includes ensuring that the environment is fully considered during the development of the Plan. This Environmental Report is presented as the Strategic Environmental Assessment (SEA) for the Bovine Tuberculosis (TB) in Northern Ireland: Blueprint for Eradication with a focus on the further development of potential Wildlife Intervention Options ('the plan'). The purpose of this Environmental Report is to assess and describe the potential significant effects on the wider environment that could arise from implementing the Plan.

A screening appraisal for appropriate assessment was undertaken for the Plan to establish whether or not the Plan is likely to have a significant negative effect upon the integrity of any European site (either alone or in combination with other plans and projects) in view of the site's Conservation Objectives. This appraisal considered the potential effects of the implementation of the Plan and determined that there was no pathway for any Likely Significant Effects. As there was no prospect of any Likely Significant Effects, there is no requirement for the Plan to undergo Appropriate Assessment.

Description of the Bovine TB Blueprint for Eradication and the potential Wildlife Intervention Options

The Blueprint for Eradication of bTB within Northern Ireland has been developed to reduce bTB herd incidence and achieve eradication by 2050. The Blueprint has 34 measures within three key areas of People, Cattle and Wildlife on the basis that a unified and multisectoral approach is required to achieve bTB eradication. The measures are formulated across five fundamental themes;

1. People, Partnership and Science – Changing the Culture
2. Cattle Intervention
3. Wildlife Intervention Measures
4. Regionalisation
5. Finance

The measures consist of actions which can be implemented in the short, medium and long-term.

The potential Wildlife Intervention Options are set out in the Consultation on the Department's potential Wildlife Intervention Options for the control of Bovine Tuberculosis in Northern Ireland. This document identifies three potential options for controlling bTB transmission from wildlife, specifically in relation to badgers, which may be introduced in designated intervention areas:

- Non-Selective Culling;
- TVR (Test and Vaccinate or Remove); and

- Vaccination Only.

There are a series of different deployment methods that may be used to implement the potential Wildlife Intervention Options, including the following:

- Non-Selective Culling using controlled shooting of free roaming badgers (supplemented by cage trapping);
- Non-Selective Culling using cage trapping;
- Non-Selective Culling using stopped restraints;
- TVR using baited cages;
- TVR using stopped restraints;
- Vaccination Only using baited cages; and
- Vaccination Only using stopped restraints.

The consultation document also includes a proposal for an amendment to legislation to allow lay vaccinators (a trained lay person operating under veterinary orders/supervision) to undertake the trapping and vaccination of badgers, in order to facilitate vaccine roll-out on a large scale within Northern Ireland.

As it is a national level programme, the assessment of the Plan primarily focuses on activities occurring at a national to regional scale, while also considering any likely significant environmental effects across the border in the Republic of Ireland.

Baseline and Environmental Issues

An environmental baseline was produced by SEA environmental topic. The full environmental baseline can be found in **Section 3** of this report. The purpose of this section is to demonstrate the level of baseline environmental information to be used in the assessment of potential effects of the proposed policies.

Biodiversity, Flora and Fauna

The Plan area contains a variety of habitats and species which are of conservation concern and are protected under a number of European and national designations. Special Protection Areas (SPAs) are designated under the EU Directive on the Conservation of Wild Birds (EC/79/409), “The Birds Directive”, as areas that are important for breeding, feeding, wintering or migration of rare and vulnerable bird species. There are 16 SPAs designated in Northern Ireland to date. Special Areas of Conservation (SACs) are designated in accordance with the Habitats Directive (92/43/EEC) for the conservation of certain habitats and species. There are 58 SACs designated in Northern Ireland to date. Northern Ireland has 49 habitats listed in Annex I of the Habitats Directive, of which 13 are considered to be priority habitats at a European level, and 18 species listed in Annex II of the Directive. There are 20 Ramsar sites in Northern Ireland, which are designated under the “Ramsar Convention”, which is an international treaty for the conservation and sustainable use of wetlands.

Areas of Special Scientific Interest (ASSIs) are protected under the Environment (Northern Ireland) Order 2002. There are 394 ASSIs designated in Northern Ireland for the presence of flora or fauna of special scientific interest or for the geological features present. In addition, each council area in Northern Ireland reports on locally important sensitive or valued habitats through the production of Local Biodiversity Action Plans (LBAPs). There are 940 Sites of Local Nature Conservation Importance (SLNCI) and 50 National Nature Reserves.

The most recent reporting for European designated habitats and species in Northern Ireland is the 4th UK Habitats Directive Report. This report indicated that for European designated habitats indicates that 44 out of 48 have at least one pressure that relates to agricultural activities such as water pollution and degradation, air pollution, and land use including grazing practices, fertiliser application or land drainage. For designated species, 24 out of 26 were identified as having these pressures, including land management practices, pollution of surface, ground or marine waters, and air pollution arising from mixed sources. For ASSIs, the latest reporting indicates that only 54% of all features are in a favourable condition, for biological features comprising 38% of habitats and 58% of species. For water-dependent European sites, 71% are currently in unfavourable conservation condition (i.e., failing to meet their conservation objectives), with these failures relating to pressures from the water environment in 23% of sites.

Population and Human Health

According to NISRA (Northern Ireland Statistics and Research Agency) in 2024, the total population in Northern Ireland was 1.93 million people and is predicted to increase to approximately 1.95 million individuals by 2033.

In 2021-2023, life expectancy at birth was 78.8 years for men and 82.5 years for women living in Northern Ireland. Northern Ireland has an ageing population, with 18.1% aged over 65 years, and it is projected that the over 65-year population will be larger than the number of children (0-15 years) from mid-2027 onwards.

Good air quality is essential for human health and wellbeing. Transport is a significant source of the air pollutant emissions of nitrogen dioxide (NO_2) and particulate matter (PM). These can act as a lung irritant and can lower resistance to respiratory infections.

Within Northern Ireland, the 2024 TB incidence rate was 4.5 per 100,000 population, with 86 cases of active TB disease reported to the Public Heath Service, and overall cases have increased since 2021.

The availability of a clean water supply is also essential for the general health of the population. In 2024, 32.4% of reported water pollution incidences investigated by the Northern Ireland Environment Agency (NIEA) were categorised as arising from farms. There are 26 surface water and 65 groundwater protected areas for drinking water in Northern Ireland. The status of water bodies described in the 3rd cycle RBMP (River Basin Management Plan) indicates that 57.7% of surface water sites (15 out of 26) had at least one parameter that exceeded drinking water standards prior to treatment by NI Water, and that 92% of groundwater sites are currently at good status, with 8% at poor status.

Designated shellfish waters are required to meet ecological and chemical objectives under the Water Framework Directive (WFD) as well as food standards to ensure that the quality of shellfish harvested are sufficient to protect public health. Only four of nine sites monitored complied with food standard guidelines in 2024. The assessment of WFD status indicates that the status of surface water bodies associated with these sites is moderate i.e., less than good status at all 10 sites. The 3rd cycle RBMP for 2021-2027 indicates the status of surface water bodies associated with these sites; according to the surface water classification for 2021, all 10 surface water bodies were at 'moderate' surface water status.

There are 33 designated bathing waters in Northern Ireland, with the most recent assessment of quality compliance in 2025 classifying 24 as 'excellent' quality, five as 'good' quality, three as 'sufficient' quality and one as 'poor' quality for bathing.

Geology, Soils and Land Use

The geological landscape of Northern Ireland is remarkably varied considering it is a relatively small area of approximately 14,000km^2 and is a reflection of the diverse geology on which it has been shaped. Soil formation is equally varied, with nine main soil types identified across Northern Ireland.

Land use in Northern Ireland is primarily composed of 'Pastures' (8,889km^2), followed by 'Natural grassland' (1,024km^2), 'Moors and heathland' (640km^2) and 'Peat bogs' (550km^2). Pastures, which comprise approximately 63% of land cover across Northern Ireland, are located across the country, with the exception of upland areas, such as the Mourne Mountains in the south-east, the Antrim Hills in the north-east, the Sperrins in the west and raised bog peatland areas in mid-Ulster. Around 77% of the total Northern Ireland land area (1.35 million hectares) is used for agriculture. Most farmland in Northern Ireland is under grass, with cattle present on 77% of farms.

The likelihood for contaminants to reach the water table from the ground surface is termed groundwater vulnerability and is a combination of land use and aquifer (rock that contains or transmits groundwater) classification. Stagnosols (named due to stagnating surface water) are the most abundant soil type across Northern Ireland, particularly in low lying areas, with the potential for widespread contaminant mobilisation in these areas.

Water

The WFD is implemented in Northern Ireland through RBMP and inter alia aims to protect and restore water sources from pollution. There are 496 WFD surface water bodies in Northern Ireland comprising 450 rivers, 21 lakes and 25 transitional and coastal waters, and 75 groundwater bodies.

The status of water bodies described in the 3rd cycle RBMP for Northern Ireland (for the period 2021-2027) indicates that Northern Ireland will not achieve the objective to have 70% of its water bodies at 'good or better'

status by 2027. There has been little improvement in status since 2015, with around 38% of water bodies at 'good or better' status according to the latest assessments. 30% of river water bodies achieved good or high ecological status in 2021, a decline from 2018 (31%) and 2015 (33%) assessments. 14% of lakes achieved good ecological status in 2021, in comparison to 24% achieving good or high status in 2018 and 2015. 40% of transitional and coastal water bodies achieved good ecological status in 2021. The main pressures on the water environment in Northern Ireland have been identified as nutrient pressures, which are mostly linked to agricultural activities and sewage-related problems.

Air

On the whole, air quality in Northern Ireland has improved significantly over the past few decades; in particular, concentrations of sulphur dioxide, originating from the combustion of coal and oil, has reduced. However, some pollutants are continuing to exceed air quality objectives. This has consequences on both human health and on some of our most important habitats that are sensitive to the effects of atmospheric pollutant deposition

The latest reporting of UK air emissions indicates that most pollutant emission levels were lower in 2023 than they were in 2005, however, ammonia emissions have increased since 2010. Air pollution from domestic combustion and road transport remains key challenges for air quality for human health.

Climatic Factors

Climate change represents one of the most important threats to the environment, and to the economy. UK Climate Change Projections anticipate a greater chance of hotter, drier summers and warmer, wetter, winters with more extreme weather and rising sea levels. These effects of climate change are likely to increase pluvial, fluvial and coastal flooding, and there is potential for increased drought.

Northern Ireland has a legally binding target for the reduction of greenhouse gas (GHG) emissions by 100% by 2050 from 1990 baseline levels. According to the most recent reporting through the Northern Ireland GHG Inventory, Northern Ireland accounted for 5.3% of the UK total GHG emissions in 2020, which is in disproportion to its population share. Compared to the base reporting year (1990), Northern Ireland's total GHG emissions have decreased by 23.2%, however by 2023 there has been an increase of 5% compared with 2020.

Material Assets

The term 'Material Assets' can be considered very broadly within the SEA process, encompassing for example infrastructure, settlements, transport, and utilities. In the context of this SEA, 'Material Assets' predominantly focusses on the number and types of agricultural assets found in Northern Ireland, as it is considered that the most potential for positive or negative effects on material assets from implementation of the Plan relates to these.

There was a total of 26,190 farms in Northern Ireland in 2024, covering an area of 1,040,392 hectares. Although, this is an increase of 59 in the total number of farms, there has been a continuous downward trend in the number of farms from a total of 40,724 in 1981, decreasing by 10% in the 15-year period between 2004 and 2019. The area of land farmed, however, has remained relatively stable since 1981. Over 80% of Northern Ireland farms were classed as very small in 2024. Cattle and sheep represent the predominant farm type, with 77% of farms keeping some cattle, and 38% keeping some sheep.

There was a total of 51,213 farm workers in Northern Ireland in 2024, 79.3% of which were farmers, partners, directors or spouses, and the remaining 20.7% other farm workers. This represents a decrease of approximately 24.5% in the total farm workforce between 1981 and 2024, however the breakdown of total farm workers between farmers, directors, partners or spouses and all other farm workers (approximately 79% to 21%) has remained relatively stable since 2004. The gross output from farming in 2024 was estimated at £3.19 billion, an increase of 7.5% from 2023. The gross input to farming in 2024 was estimated at £2.09 billion, a decrease of 2.6% from the previous year.

In addition, consideration has been given to cattle given that bTB affects cattle through infections leading to cattle slaughtering and herd restrictions should a bTB infection occur. Total cattle numbers in 2024 were 1,673,236. In 2024, there were 2,314 cattle herds affected by bTB compared to 2,199 in 2023. Since 2014, there has been a general increasing trend in the annual TB herd incidence rate from 5% in 2014 to over 10% from 2022 onwards. During 2024, there was a 13.6% increase in animal disease compensation payments to farmers compared to 2023, with a total of £41.8 million.

Cultural, Architectural and Archaeological Heritage

Northern Ireland is rich in cultural, architectural, and archaeological heritage, with many important archaeological sites, monuments and heritage buildings which are afforded varying levels of protection under national legislation such as the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995 and the Planning Act (Northern Ireland) 2011. There are 51,820 recorded heritage assets included in the Historic Environment Record of Northern Ireland (HERoNI) and over 12,000 designated heritage assets including Monuments in State Care, Scheduled Historic Monuments, protected wrecks, Listed Buildings, and Conservation Areas.

Historic Parks, Gardens and Demesnes are protected in the Local Development Plan (LDP) process; there are 300 of these sites included in the HERoNI. There are 547 Local Landscape Policy Areas, 11 Areas of Significant Archaeological Interest (representing distinctive areas of the historic landscape), and 177 Areas of Townscape / Village Character designated in Local Development Plans (LDPs). There are also two United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Sites (WHS) in Northern Ireland: the Giant's Causeway is designated for its unique geological heritage; and Gracehill, a Moravian Church Settlement, is Northern Ireland's first cultural heritage WHS, designated in 2024.

Landscape and Visual Amenity

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

There are eight Areas of Outstanding Natural Beauty (AONBs) in Northern Ireland, designated for their distinctive landscape character and high scenic value, covering 20% of the total land area. There are also eight NIEA Country Parks, and 56 National Trust Sites within Northern Ireland. Areas of High Scenic Value (AHSV) and scenic views are designated in LDPs to protect the setting of the urban area and other areas of particular landscape merit. Planning permission may not be granted for development proposals within AHSV that would be likely to have a significant negative effect on the quality, character, and features of interest.

The Nature Conservation and Amenity Lands Order (Northern Ireland) 1985 is the current legislative basis for the protection of landscapes. The Northern Ireland Landscape Character Assessment (2000) subdivided the countryside into 130 Landscape Character Areas, based upon local patterns of geology, landform, land use, cultural and ecological features, while the Northern Ireland Regional Landscape Character Assessment (2016) aimed to provide a regional framework upon which more detailed local studies could be based, subdividing the countryside into 26 Regional Character Areas based upon information relating to people and place and the combinations of nature, culture and perception that contribute to local uniqueness.

Pressures on the landscape in Northern Ireland include developments (including housing, industrial and recreational), infrastructure, extraction industries, agriculture and forestry, and tourism. Land cover and habitats have changed in the past few decades as a result of population increases, changes in household structure and employment patterns and agricultural restructuring.

Evolution of the Environment in the Absence of the Plan

The evolution of the environment in the absence of the Plan was discussed in this Environmental Report as required under the SEA Directive (2001/42/EC) to indicate likely future environmental changes regardless of the implementation of the Plan. If there were no Plan in place, there would likely to be impacts on material assets with respect to cattle as an agricultural asset through the continued prevalence of bTB disease. The likely future impacts of this are discussed by environmental topic in **Section 3.3**.

Review of Relevant Plans and Programmes

All International, European, national, and regional plans, programmes, policies and legislation considered to be relevant to the Plan were reviewed. This review took into account where the Plan lies in relation to higher and lower tiered plans and programmes and considered how these could affect the Plan as well as how the Plan could interact with the aims of these plans and programmes.

Assessment Methodology

This Environmental Report has been produced to assess the effects of implementing the various measures outlined in the Plan. In parallel to this, a screening for appropriate assessment has been prepared to inform the decision-making process, in terms of the potential measures to impact upon the integrity of any European sites in view of site conservation objectives.

The approach used for assessing the Plan was an objective-led assessment. This was at a strategic level based on a system of *objectives*, *targets* and *indicators* to rationalise information for assessment purposes, as it is not possible or practicable for the baseline environment to be described and assessed in as much detail as could be done for a project-level Environmental Impact Assessment.

A review of the baseline information and proposed measures within the Plan has indicated that the following topics are unlikely to lead to significant positive or negative, direct or indirect effects in the short, medium or long-term at the strategic national scale:

- Geology, Soils & Land Use (GSL);
- Water (W);
- Climatic Factors (CF);
- Cultural, Architectural and Archaeological Heritage (CH); and
- Landscape & Visual Amenity (L).

There may be potential for several highly localised effects on these topics from the implementation of the Plan; however, these are not expected to be significant at a strategic national level, and it is also not expected that transboundary impacts will arise on these topics. At the SEA scoping stage, it was proposed that these topics were 'scoped out' i.e., not brought forward to the assessment stage. However, in their role as statutory SEA consultee, DAERA recommended that, although significant impacts are not anticipated, these topics should be considered within the assessment. Therefore, these SEA topics have been included within the environmental assessment in this Environmental Report.

The proposed measures of the Plan have been assessed against a set of Strategic Environmental Objectives (SEOs). These SEOs were developed in the context of broader environmental protection objectives set at both international and national level and also took into account the context of potential for impacts associated with the Plan. Each high-level SEO has been paired with a specific indicator(s) as well as target(s) that can be used to measure the progress towards achievement of these targets. The SEOs, Indicators and Targets used are given in **Table 0-1**. The assessment examined the likely significant positive and negative effects of the proposed measures of the Plan and how their implementation could contribute to achieving these SEOs.

Table 0-1: Strategic Environmental Objectives for the Plan

SEA Topic	Objective	Objective Description	Indicators	Targets
Biodiversity, Flora & Fauna	Avoid damage to, and where possible enhance, biodiversity, flora and fauna.	Preserve, protect, maintain and, where possible, enhance biodiversity and ecosystems within NI, including internationally, nationally, and locally protected sites, habitats and species, and other known species of conservation concern.	• Conservation status of designated habitats and species within International/ European and national designated sites (SACs, SPAs, Ramsar sites, MCZs, ASSIs). • Status of protected and priority habitats and species (e.g., Annex I habitats, Annex II species and Annex IV species, NI Priority Habitats and Species, OSPAR Threatened or	• No negative change, or a positive change, in the conservation status of designated habitats and species within International, European and National designated sites. • No negative change, or a positive change, in the status of protected or priority species and habitats outside designated sites, or to areas of known importance. • No negative long-term change in the status of species protected

SEA Topic	Objective	Objective Description	Indicators	Targets
			Declining Habitats and Species). • Population dynamics, status and abundance of species protected through the Wildlife (NI) Order 1985 and amendment The Wildlife (Amendment) (Northern Ireland) Order 1995, including badgers.	through the Wildlife (NI) Order 1985 and amendment The Wildlife (Amendment) (Northern Ireland) Order 1995 at a national level.
Population & Human Health	Reduce rate of TB incidence in the population and avoid generation of noise disturbances.	Reduction in the occurrence of bTB in humans and avoidance of significant noise disturbance.	• bTB incidence rates in the population. • Local council noise disturbance rates.	• No negative change, or a positive change, in the bTB incident rates in the population. • No negative change in local council noise disturbance rates/incidents because of culling activities.
Geology, Soils and Land Use	Protect soils from pollution and prevent degradation or loss of the soil resource.	Protect against physical damage to, or loss of, the soil resource.	• Soil health and quality of agricultural land. • Soil resource within the agriculture sector.	• No negative change, or a positive change, in soil health and land quality. • No loss of the soil resource.
Water	Avoid impacts on, and where possible enhance, the status or quality of waterbodies.	Protect and restore water quality from pollution.	• WFD status of surface and groundwater bodies, including Protected Areas.	• No negative change, or a positive change, in the status of surface water and groundwater bodies, including Protected Areas, and potential to contribute to the achievement of water body objectives under the WFD Regulations.
Air	Avoid, prevent or reduce harmful effects on human health and the environment resulting from emissions and noise pollution to air.	Avoid air quality and noise impacts.	• Quantity and trends of air emissions. • Local council noise disturbance rates.	• No negative change in the quantity of emissions to air arising from the potential Wildlife Intervention Options. • No negative change in local council noise disturbance rates/incidents as a result of potential Wildlife Intervention Options.

SEA Topic	Objective	Objective Description	Indicators	Targets
Climatic Factors	Avoid, prevent or reduce GHG emissions.	Avoid or reduce impacts to GHG emissions.	• Quantity and trends of GHG emissions.	• No negative change in the quantity of GHG emissions to air arising from the potential Wildlife Intervention Options.
Material Assets & Infrastructure	Support economic agricultural activities and productivity through reduction in bTB incidence and herd breakdowns.	Support agriculture industries focused on cattle production through fewer bTB incidents and herd breakdowns with improvements in livestock health and biosecurity.	• Agricultural outputs and productivity. • bTB incident rates in livestock. • bTB herd breakdown rates. • Quality of animal products available for consumption	• Sustainable increase in agricultural productivity, i.e., a more efficient use of resources with fewer bTB affected cattle slaughtered. • Decrease in the occurrence of bTB affected cattle numbers and herd breakdowns. • No negative change, or a positive change in the quality of animal products.
Cultural, Architectural and Archaeological Heritage	Protect, conserve, and enhance designated and non-designated heritage assets and their settings	Protect, conserve, and enhance designated and non-designated heritage assets and their settings.	• Number, condition and setting of international, national and local heritage designations.	• No loss or negative change to the condition or setting of international, national and local heritage designations.
Landscape and Visual Amenity	Protect, and where possible enhance, the character and quality of landscapes, riverscapes, and lakescapes.	Protect and enhance the character and quality of landscapes, riverscapes, and lakescapes.	• Landscape/ Seascape Character Assessments. • Local Development Plan scenic views and Areas of High Scenic Value.	• No negative change, or a positive change, in visual amenity or landscape / seascape character and local views.

Each of the proposed measures for the Plan have been assessed in the short, medium, and long-term for likely effects, the significance of the effects, and whether they are positive or negative effects against SEA objectives. For the purposes of this assessment:

- Plus (+) indicates a potential positive environmental effect;
- Minus (-) indicates a potential negative environmental effect;
- Plus/minus (+/-) indicates that both positive and negative environmental effects are likely or that, in the absence of further detail, the potential effects are unclear or uncertain. If a situation arose whereby positive effects outweighed negative effects, or *vice versa*, an additional + or – was used (++/- or +/--);
  • Zero (0) indicates neutral or no effect;
- Short-term – 0 – 2 years (immediate);
- Medium-term – 2 – 4 years; and
- Long-term – beyond 4 years.

Other impacts that have been assessed for significance are secondary effects, cumulative effects, synergistic effects, temporary and permanent effects, and the inter-relationship of effects.

All potential positive and negative effects will be presented individually, with a text description, and a summary table. Under each measure, a discussion is presented to support the assessment outcomes.

Consideration of Alternatives

A Do-Nothing scenario was considered within this Environmental Report as Strategic Alternative 1, whereby no new measures to control bTB are introduced in Northern Ireland. DAERA has indicated that the current financial expenditure on the bTB eradication programme is unsustainable and that disease trends are continuing to increase. Under a Do-Nothing scenario, disease rates will continue to increase alongside expenditure with respect to compensation for slaughtered livestock.

Strategic Alternative 2 was considered, whereby no potential wildlife intervention options are introduced with only the remaining measures under the Blueprint introduced. This will likely lead to improvements with respect to the introduction of cattle intervention measures through improved biosecurity reducing bTB infections and herd breakdowns. Addressing Finance measures will enable improvements to be made regarding the presently high and unsustainable levels of expenditure associated with bTB eradication, particularly with regard to compensation payments for bTB slaughtered cattle. However, it is the opinion of DAERA, that addressing and controlling bTB requires the use of wildlife intervention measures in tandem with cattle measures, and that without the implementation of either approach, bTB will fail to be eradicated. Therefore, Strategic Alternative 3 as the implementation of the measures outlined within the Plan is the Preferred Option as this includes the implementation of the potential wildlife intervention options.

Environmental Assessment of Proposed Measures

Environmental Assessment of Proposed Measures within the Blueprint

The assessment of the proposed measures of the Blueprint is detailed in **Section 7.1** of this report and summarised in **Table 0-2**.

Table 0-2: Summary of the assessment of the proposed measures of the Blueprint against SEOs

Measure	BFF	PHH	GSL	W	A	CF	MA	CH	L
Cattle Intervention									
Field Surveillance and Testing	0	+	0	0	0	0	+/-	0	0
Abattoir Surveillance	0	+	0	0	0	0	+/-	0	0
Interferon Gamma (IFNg) Testing	0	+	0	0	0	0	+/-	0	0
Criteria for Officially Tuberculosis Free (OTF) Status	0	0	0	0	0	0	+/-	0	0
Inconclusive Skin Reactors (ICs)	0	0	0	0	0	0	+/-	0	0
Full and Partial Depopulations	0	0	0	0	0	0	+/-	0	0
Restocking after bTB Breakdown and Application of	0	0	0	0	0	0	+/-	0	0

Measure	BFF	PHH	GSL	W	A	CF	MA	CH	L
Severe Breakdown Status									
Herds with Prolonged and Recurring Breakdowns	0	+	0	0	0	0	+	0	0
Whole Genome Sequencing	0	+	0	0	0	0	+	0	0
Legislative powers to test non-bovines for bTB	0	0	0	0	0	0	+/-	0	0
Restrictions and risk-based trading	0	0	0	0	0	0	+/-	0	0
Herd Health Management and Biosecurity Advice	+	+	0	0	0	0	+	0	0
Capital grants for safe and effective on farm testing facilities and biosecurity improvements	+/-	+/-	0	0	0	0	+	0	0
Wildlife Intervention									
Wildlife Intervention	-	+/-	0	0	-	0	+	0	0
Badger RTA Survey	0	0	0	0	0	0	0	0	0
Badger Sett App	0	0	0	0	0	0	0	0	0
Role of Deer	0	0	0	0	0	0	0	0	0

BFF – Biodiversity, Flora and Fauna; PHH – Population and Human Health; GSL – Geology, Soils and Land use; W – Water; A – Air; CF – Climatic Factors; MA – Material Assets; CH – Cultural Heritage; L – Landscape and visual amenity.

For the most part, the implementation of the proposed measures of the Blueprint has the potential for positive effects on the SEO for MA by improving cattle health and biosecurity, reducing bTB incidences and herd breakdowns, and protecting cattle as an agricultural asset. There is potential for both positive and negative effects on the SEO for BFF. Positive effects could arise from improved biosecurity under the cattle intervention measures, which may reduce disease transmission to wildlife. Negative effects may arise from the implementation of wildlife intervention measures, including through the culling of badgers and disturbance to wildlife populations during implementation.

Environmental Assessment of Proposed Measures within the Potential Wildlife Intervention Options

The assessment of the proposed measures of the wildlife intervention options is provided in **Section 7.2** and summarised in **Table 0-3**.

Table 0-3: Summary of the assessment of the potential Wildlife Intervention Options against SEOs

Measure	BFF	PHH	GSL	W	A	CF	MA	CH	L
Potential Wildlife Intervention Options									
Non-Selective Culling using controlled shooting of free roaming badgers (supplemented by cage trapping)	-	+/-	0	0	-	0	+	0	0
Non-Selective Culling using cage trapping	-	+/-	0	0	-	0	+	0	0
Non-Selective Culling using stopped restraints	-	+/-	0	0	-	0	+	0	0
TVR using baited cages	+/-	+/-	0	0	0	0	+	0	0
TVR using stopped restraints	+/-	+/-	0	0	0	0	+	0	0
Vaccination Only using baited cages	+/-	+	0	0	0	0	+	0	0
Vaccination Only using stopped restraints	+/-	+	0	0	0	0	+	0	0
Lay Vaccinators	0	0	0	0	0	0	0	0	0

BFF – Biodiversity, Flora and Fauna; PHH – Population and Human Health; GSL – Geology, Soils and Land use; W – Water; A – Air; CF – Climatic Factors; MA – Material Assets; CH – Cultural Heritage; L – Landscape and visual amenity.

Overall, the proposed Wildlife Intervention Options have the potential to generate positive indirect effects on the SEO for MA through improved cattle health, as a result of reduced bTB prevalence within the wildlife reservoir.

The SEO for BFF may be affected both positively and negatively: badger culling could have negative effects, while the TVR and Vaccination Only options may have positive effects through improved badger health following vaccination. The proposals may also have positive indirect effects on PHH by reducing bTB prevalence in wildlife and therefore lowering the risk of infection to farm workers and the local population. However, the use

of shooting as a culling method may have negative effects on PHH and A due to noise and disturbance impacts on nearby receptors.

The proposal to use lay vaccinators is assessed as neutral, as it would not have direct or indirect effects on the SEOs for BFF, PHH, MA or A, although it may support wider delivery of vaccination programmes. No pathway for strategic-level effects has been identified for the SEOs of GSL, W, CF, CH and L, and these have therefore also been assessed as neutral.

Mitigation and Monitoring

Mitigation

The iterative development of the Plan involved the consideration of the measures included in the previous Bovine Tuberculosis Eradication Strategy for Northern Ireland, which was published by DAERA in 2022, with a review of the approach on the eradication and control of bTB undertaken by the CVO. The development of the plan has also considered the previous wildlife intervention element of the Eradication Strategy, which was subject to judicial review in 2022, and which was overturned in 2023. In response to this a new stakeholder group, the TBPSG, was formed in 2025 with the vision to introduce transformative, effective and evidence based solutions to address bTB. In April 2025, the TBPSG produced the Bovine TB in Northern Ireland: Blueprint for Eradication, taking into account the CVO's review of bTB within Northern Ireland, and building upon the DAERA Bovine Tuberculosis Eradication Strategy for Northern Ireland 2022.

The proposed potential wildlife intervention options have been developed based on the Department's view of what are viable, evidence-based and science-informed options that could make a significant and positive impact on disease levels. This has involved input from NIEA, VSAHG and the Department's Chief Scientific Adviser.

The SEA team has provided feedback to DAERA where the potential for adverse environmental effects was identified, and recommended omissions and changes to strengthen measures. Many of these recommendations have been applied by DAERA.

The SEA has proposed mitigation which should be adhered to where negative or uncertain effects have been identified from the assessment of the Plan. These measures aim to prevent, reduce and as fully as possible offset any significant negative effects on the environment due to the implementation of measures within the Plan. Primarily, the mitigation measures relate to additional clarification information for further understanding of the measures and their potential impacts, particularly regarding the cattle intervention measures. For the potential wildlife intervention options, mitigation has been suggested to provide clarity on how the intervention options will be implemented to address potential welfare concerns which may arise from the current information available.

Monitoring

An SEA environmental monitoring programme is also provided. This is based upon the Indicators and Targets established for the SEOs. This environmental monitoring data can be collated from existing information gathered regarding bTB disease outbreaks, however information in relation to badgers will require new monitoring to be established. Other data in relation to designated sites and species, human health and air quality can be obtained from environmental monitoring undertaken by bodies such as DAERA, AFBI, Public Health Agency and NISRA. Some of the indicators and data proposed for the monitoring of the Plan implementation are at a strategic level, to match the SEOs, e.g. information on bTB disease outbreaks, designated sites and species. The data sources for monitoring of effects are mostly at a strategic level, are nationally consistent and all are freely available, as is typical for SEA monitoring. However, indicators and data proposed for monitoring of badgers will be required on a bespoke, local basis subject to the intervention areas proposed for implementation of the potential wildlife intervention options.

As part of the implementation of the Plan, DAERA has also included programme monitoring which includes annual reviewing, reporting and updating. These will establish the bTB disease situation in the preceding year alongside recording progress with implementing the Blueprint. DAERA's programme management structures are also in place to oversee the implementation of the Blueprint, with a Programme Board meeting on a quarterly basis and monthly Project Lead Group meetings.

Summary and Conclusions

An SEA was undertaken of the Plan for the eradication of bTB. The SEA Environmental Report has identified the potential positive and negative effects on the wider environment from implementing the measures proposed for inclusion in the Plan, along with highlighting the potential cumulative or synergistic effects of measures. This report is designed to help support the further consideration of these measures and the implementation of the Plan by DAERA.

In general, the Plan aims to introduce measures to address the prevalence of bTB infection through targeting cattle, wildlife and finance. The Plan includes measures listed within the Blueprint and within the separate consultation document for the potential Wildlife Intervention Options. These measures were assessed in terms of their potential for positive and negative effects, and the significance of these effects on the environment against a set of SEOs covering the breadth of environmental topics considered by the SEA; these were developed in the context of the broader environmental protection objectives set at both international and national level. The purpose of this was to predict and evaluate as far as possible, the environmental effects of the Plan, highlighting any significant environmental problems and/or benefits that are likely to arise from its implementation. The implementation of the Plan is unlikely to lead to significant positive or negative, direct or indirect effects in the short, medium or long-term at the strategic national scale on the SEA topics of Geology, Soils and Land Use, Water, Climatic Factors, Cultural, Architectural and Archaeological Heritage and Landscape and Visual Amenity, with only a number of highly localised potential effects identified within these SEA topics, and these topics were therefore assessed as neutral in the environmental assessment.

For the most part, the measures proposed for cattle intervention will have potential for positive effects on the SEOs for Material Assets and for Population and Human Health, provided they are effectively implemented and enforced. The measures proposed for the wildlife intervention options generally have the potential for negative effects on the SEOs for Air, Population and Human Health and Biodiversity, Flora and Fauna. An exception to this is the identification of the potential for positive effects from the implementation of the vaccination options of the wildlife intervention, as this method would help to address bTB infection within badger populations and improve overall badger health without a requirement for a large population reduction within intervention areas.

Consideration of the environmental baseline conditions indicates that bTB incidences and infections have continued to increase in Northern Ireland, with associated high expenditure by government on eradication and compensation and therefore action is required to address this. The introduction of measures of cattle intervention, and wildlife intervention, are expected to contribute to a positive direction change regarding the prevalence of bTB. However, key consideration should be given to the implementation of the potential wildlife intervention options regarding the importance of badgers to ecology and biodiversity. Specific mitigation has been proposed for the Plan, where the potential for negative and/or uncertain effects on SEOs from the implementation of measures has been identified in the assessments.

A screening appraisal for appropriate assessment was undertaken regarding the Plan to establish whether or not the Plan is likely to have a significant negative effect upon the integrity of any European site (either alone or in combination with other plans and projects) in view of the site's Conservation Objectives. This appraisal considered the potential effects of habitat loss, degradation and fragmentation, changes in badger ranging behaviour and associated predation effects, accidental bycatch of other Annex II species under capture methods and the European Sites present throughout Northern Ireland. No pathway of effect was identified which can result in a Likely Significant Effect on any European Site. As no effects beyond a potentially *de minimis* level were identified, the screening determined that there was no prospect that Likely Significant Effects could occur in combination with any other plan or project. On the basis of this screening appraisal, it was determined that there is no requirement for the Plan to undergo Appropriate Assessment.

Next Steps

Consultations on the Plan, SEA Environmental Report and screening for appropriate assessment will commence in July 2026 and will run for 12 weeks. Following completion of the consultation period, all comments will be collated and the Plan, SEA Environmental Report and screening for appropriate assessment will be reviewed and revised as necessary. Provided there are no objections or comments that will significantly alter the Plan, the final version of the Plan can be drafted and adopted. This is anticipated to be in Q4 2026. Following release of the adopted Plan, an SEA statement will be drafted to summarise the process undertaken and identify the manner by which environmental considerations and consultations were integrated into the final Plan.

1 Introduction

1.1 Background

This Strategic Environmental Assessment (SEA) Environmental Report has been prepared in accordance with the European Communities Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive), and in accordance with the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 (S.R. 280/2004).

The purpose of this Environmental Report is to provide a formal and transparent assessment of the likely significant effects on the environment arising from the implementation of the Bovine Tuberculosis (bTB) in Northern Ireland: Blueprint for Eradication with a focus on the further development of potential Wildlife Intervention Options ('the plan'), including the approach, the permitted deployment method(s) for the potential wildlife intervention options, and the potential for the introduction of licensed lay vaccinators within Northern Ireland.

The bovine bTB Eradication Strategy was published by the Department of Agriculture, Environment and Rural Affairs (DAERA) in 2022 and outlined the various contributing factors to bTB in Northern Ireland. However, the Strategy was subject to judicial review against DAERA in 2022, relating to the adequacy of information on, and effective stakeholder consultation in relation to, the decision to proceed with a non-selective cull of badgers, following which the proposed wildlife intervention measures of the Strategy were overturned in 2023. The Bovine TB Blueprint has subsequently been developed, which has further advanced and updated the measures that were set out in the Eradication Strategy. The potential options for wildlife intervention have been further considered and advanced by DAERA. Therefore, at this time, DAERA wishes to consult on these wildlife intervention proposals, their deployment method (s) and the introduction of lay vaccinators, as part of and in the wider context of, the strategic actions of the Blueprint.

The SEA proposes to focus assessment primarily on the proposals within the potential Wildlife Intervention Options consultation document (as these give rise to the greatest likelihood of environmental effects), while also giving due consideration to the overarching measures within the Blueprint. Further detail regarding the proposed scope of assessment is provided in **Section 2**.

The SEA of the Plan is being completed on behalf of DAERA, who is the responsible authority for the preparation and adoption of the Plan.

1.2 Strategic Environmental Assessment

The SEA Directive requires that certain Plans and Programmes, prepared by statutory bodies, which are likely to have a significant impact on the environment, be subject to the SEA process. The SEA process is broadly comprised of the steps shown in **Figure 1-1**. These are given a summary description in **Table 1-1**.

DAERA has commissioned Tetra Tech to undertake an SEA of the potential Wildlife Intervention Options with due consideration of the wider Blueprint measures. This will provide further information to DAERA on the potential positive and negative implications of implementing any of the proposed measures, which will feed into the review process.

Table 1-1: Summary Descriptions of Main Stages in SEA Process

Stage	Description	Status
Screening	Determines whether SEA is required for a Plan / Programme in consultation with the designated statutory consultees.	DAERA has elected to voluntarily undertake an SEA.
Scoping	Determines the scope and level of assessment detail for the SEA, in consultation with the designated statutory consultees.	Completed March 2026
Environmental Assessment	Formal and transparent assessment of the likely significant impacts on the environment arising from implementation of the Plan, including all reasonable alternatives. The output from this is an Environmental Report, which must go on public display along with the Plan.	Current Stage
SEA Statement	Summarises the process undertaken and identifies the manner in which environmental considerations and consultations have been integrated into the final Plan.	Q4 2026

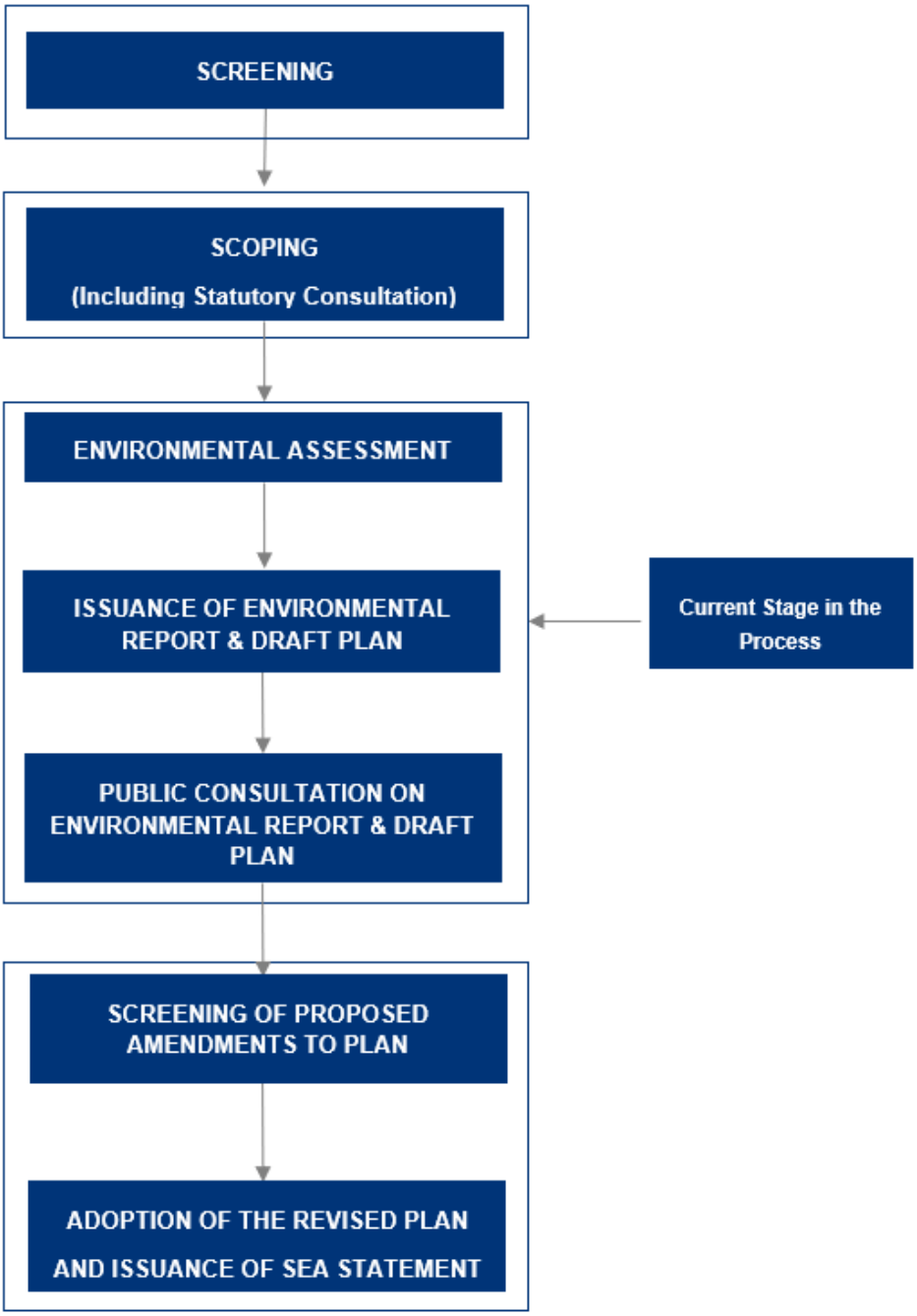

Figure 1-1: Overview of the SEA Process

1.3 Screening for SEA

DAERA has elected to undertake SEA voluntarily to ensure that there is consideration for wider sustainability and potential effects of the implementation of proposed Plan measures on the environment.

1.4 Scoping for SEA

The SEA Scoping for the Plan took place from November 2025-March 2026, followed by statutory consultation from March-April 2026. A Scoping Report was produced, the purpose of which was to provide sufficient information on the Plan to enable consultees to form an opinion on the appropriateness of the scope, format,

level of detail, methodology of assessment and the consultation period proposed for the SEA Environmental Report.

The issuing of a draft Scoping Report to consultees is recommended as good practice and can inform stakeholders about the key environmental issues and key elements of the Plan or Programme. In addition, the Scoping Report can be used as a tool to generate comments from stakeholders on the scope and approach of the SEA. **Table 1-2** was created to generate discussion during the scoping process and consultation in relation to the SEA receptors and was subsequently amended following scoping responses.

Table 1-2: Potential Environmental Issues by SEA Topic

SEA Topic	Scoped In / Out	Potential Environmental Effects
Biodiversity, Flora & Fauna	**In**	• Potential for effects on protected areas, including those of international (SACs, SPAs, Ramsar Sites), National (ASSIs, NNRs) and local (SLNCI) importance; • Potential for effects on protected and priority habitats and species; • Potential for regionalised direct negative impacts on badger populations within intervention areas from culling activities as a protected species. • Potential for disturbance or displacement effects on species; and • Potential for indirect effects on water-dependent habitats and species (including effects on freshwater pearl mussel, salmonids, and other protected fish and shellfish species).
Population & Human Health	**In**	• Potential for direct and indirect effects on water quality (drinking and recreational activities); • Potential effects on food quality (commercial aquatic species); • Potential effects on air quality (through noise disturbance); • Potential for health and safety risks from use of firearms; and • Potential risks from biohazards (carcases and exposure to bTB).
Geology, Soils & Land use	**In**	• Potential for temporary localised effects on soil through soil loss or disturbances should trapping be introduced under the Wildlife Intervention strategies and through accessing badger habitat areas; • Potential for localised contamination effects from lead and/or TB; and • Potential for localised effects on discharges to receiving aquatic sediments / groundwater sources.
Water	**In**	• Potential for localised effects on water quality from potential contamination from badger carcasses and/or lead contamination; • Potential for localised effects on WFD Protected Areas, including for water-dependent habitats and species, economically significant aquatic species, drinking water, recreation and nutrient sensitive areas; and • Potential for localised effects on groundwater quality, including the potential for microbial and chemical contamination of drinking water supplies.
Air Quality	**In**	• Potential for localised effects on air pollutant emissions arising from vehicle and gun emissions from implementation of Wildlife Intervention strategies; and • Potential for effects of noise on local populations and human health within intervention areas from use of culling methods.
Climatic Factors	**In**	• Potential for localised, short-term temporary release of GHG pollutants from culling activities.
Material Assets	**In**	• Potential for effects on the productivity of agricultural farm holdings with fewer bTB herd breakdowns;

SEA Topic	Scoped In / Out	Potential Environmental Effects
		• Potential for increased agricultural output and farm incomes per hectare with fewer bTB herd breakdowns; • Potential for increased financial expenditure by farmers to comply with biosecurity requirement; and • Potential for financial implications from amendments to compensation regarding bTB slaughtered cattle.
Cultural, Architectural & Archaeological Heritage	**In**	• Potential for short-term temporary localised disturbance or disruption to assets or areas of importance for cultural, architectural and archaeological heritage.
Landscape & Visual Amenity	**In**	• Potential for short-term temporary localised disturbance or disruption with areas of significance for landscape or visual amenity.

1.5 SEA Guidance

Key guidance documents that have been referred to for the SEA are listed in **Appendix A** of this SEA Environmental Report.

1.6 Statutory Consultees for SEA

Under Article 6 of the SEA Directive, the responsible authority (in this case DAERA) preparing the plan or programme is required to consult with specific "environmental authorities" (statutory consultees) within appropriate timeframes to express their opinion on the draft plan or programme and the accompanying SEA Environmental Report before the adoption of the plan or programme. As some of the measures outlined in the Plan may be implemented close to the border with the Republic of Ireland and having regard to the potential cross-border nature of some measures, there is potential for transboundary impacts from implementation of the Plan. For this reason, there is a requirement to undertake transboundary consultations as part of this SEA process.

The statutory consultee established within the SEA legislation for Northern Ireland is:

- The Department of Agriculture, Environment and Rural Affairs (DAERA)

As DAERA is responsible for preparation of the Plan, consultees will include all relevant units within the Department such as the Natural Environment Division, Drinking Water Inspectorate, Climate Change Unit, Marine and Fisheries Division, Marine Plan Team and Marine Conservation and Reporting Section. The Historic Environment Division of the Department for Communities (DfC), as the government authority on heritage, will also be consulted.

The statutory consultees are established within the Irish national legislation, European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 [S.I. 435/2004] and the Planning and Development (Strategic Environmental Assessment) Regulations 2004 [S.I. 436/2004], and their recent amendments of European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011 [S.I. 200/2011] and the Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011 [S.I. 201/2011], as being:

- Environmental Protection Agency (EPA);
- Department of Housing, Local Government and Heritage (DHLGH);
- Department of the Climate, Energy and the Environment (DCEE); and
- Department of Agriculture, Food and the Marine (DAFM).

1.7 Appropriate Assessment

The Habitats Directive (Council Directive 92/43/EEC) on the conservation of natural habitats and of wild fauna and flora obliges Member States to designate, protect and conserve habitats and species of importance in a

European Union context. Article 6(3) of the Habitats Directive requires that "*Any plan or project not directly connected with or necessary to the conservation of a site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives*." The Directive was transposed into Northern Ireland legislation through the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995. Any proposed plan or project that has potential to result in a likely significant effect on a designated European site will require an Appropriate Assessment (AA). Case law has determined that the likelihood need not be great, merely possible, and that the precautionary principle must apply as set out in European Commission Guidance and as required by Court of Justice of the European Union (CJEU) case law (i.e., C 127/02 '*Waddenzee'*).

A screening for appropriate assessment was undertaken to establish whether or not the Plan is likely to have a significant negative effect upon the integrity of any European site (either alone or in combination with other plans and projects) in view of the site's Conservation Objectives. This appraisal considered the potential effects of habitat loss, degradation and fragmentation, changes in badger ranging behaviour and associated predation effects, accidental bycatch of other Annex II species under capture methods and the European Sites present throughout Northern Ireland. No pathway of effect was identified which could result in a Likely Significant Effect on any European Site. As no effects beyond a potentially *de minimis* level were identified, the screening determined that there was no prospect that Likely Significant Effects could occur in combination with any other plan or project. On the basis of this screening appraisal, it was determined that there is no requirement for the Plan to undergo Appropriate Assessment.

2 Description of the Bovine TB Blueprint for Eradication and the potential Wildlife Intervention Options

2.1 Bovine TB

Bovine Tuberculosis (bTB) is a bacterial infection primarily caused by *Mycobacterium bovis* (*M. bovis*); it is closely related to the bacterium that causes human and avian tuberculosis (TB). All mammalian species, including humans, are susceptible to bTB, which is primarily a respiratory disease, with transmission occurring through direct nose-to-nose contact and through contact with saliva, urine, faeces and milk. It is a notifiable animal disease, meaning that law requires it to be reported to government authorities. bTB infection is spread through cattle when they are directly exposed to other infectious animals or their excretions. As it is infectious across a range of farm and wild animals, controlling and eradicating the disease is difficult.

2.2 Bovine TB in Northern Ireland

Within Northern Ireland, a programme for the eradication of bTB has been in place since the late 1950s, with the current bTB programme required by the European Parliament and Council (2016) Regulation (EU) 2016/429 on Animal Health, and under the Tuberculosis Control Order (Northern Ireland) 1999 (as amended) and the Tuberculosis (Examination and Testing) Scheme (Northern Ireland) 1999 (as amended). This programme enables the trading of livestock from Northern Ireland within the European Union and internationally.

The current bTB control programme involves four key activities;

- Detection and removal of infected animals through routine annual testing using a comparative intradermal tuberculin test (known as “the skin test”);
- Abattoir surveillance, the post-mortem examination of slaughtered animals intended for human consumption for bTB lesions;
- Use of movement restrictions on infected livestock herds for a minimum period of four months, removal of infected animals to prevent infection spread and further testing to enable identification; and
- Epidemiological investigations and supplementary testing for herds and individual animals considered a risk to bTB herd breakdowns.

Prior to 2021, the bTB Eradication Plan required compliance with the European Council Directive 64/432/EEC (as amended) for the trade of bovine animals and swine, however this was revoked and replaced in April 2021 with the Animal Health Law, Regulation (EU) 2016/429 and its subordinate Commission Delegated Regulation (EU) 689/2020. Despite these long-standing control measures on bTB since the 1950s, recently there has been a deterioration in the bTB situation in Northern Ireland, with increases in both animal and herd incidences, particularly since 2019.

2.3 The Bovine TB Eradication Strategy for Northern Ireland

The Bovine Tuberculosis Eradication Strategy for Northern Ireland was published by DAERA in 2022 to address the various contributing factors to bTB in Northern Ireland. The strategy incorporated several measures to address how bTB is spread and maintained within Northern Ireland. It aimed to improve engagement with farmers, vets, conservationists, landowners and other key stakeholders to achieve eradication as well as to improve the current disease testing regime and measures of disease prevention. The Eradication Strategy also aimed to broaden research into bTB infection and its contributing factors, and to address the Wildlife components of bTB.

The Eradication Strategy included 27 actions under the following themes, with various timeframes for delivery:

- Governance and Partnership Working;
- Enhanced Cattle Measures and Testing;
- Action on Wildlife; and
- Finance and Funding.

The bTB Eradication Strategy was subject to SEA and HRA in 2021. However, the wildlife intervention element of the Eradication Strategy was subject to judicial review against DAERA in 2022, relating to the adequacy of

information on, and effective stakeholder consultation in relation to, the decision to proceed with a non-selective cull of badgers, following which the proposed Wildlife Intervention measures of the Strategy were overturned in 2023.

A review of the approach to the eradication and control of bTB and the degree of progress achieved regarding the actions outlined within the 2022 Bovine TB Eradication Strategy has since been undertaken by the Chief Veterinary Officer (CVO) for Northern Ireland, to inform the next steps required. The report indicated that, alongside recent increases in both animal and herd incidence of bTB, there has been an increase in the disclosure rate at routine slaughter of bTB in animals, known as bTB lesions at routine slaughter (LRS), rising from c. 1.5 LRS per 1,000 animals slaughtered in 2010 to c. 4.5 LRS per 1,000 animals slaughtered in 2023 (DAERA, 2024). This report indicated that several challenges exist in reducing the incidence of bTB in Northern Ireland, with urgent action required owing to the unsustainable high increases in government expenditure associated with compensation payments to farmers for slaughtered livestock, and its associated impacts on the mental and physical well-being of farmers and their families. The report contained proposals relating to measures for bTB risks from wildlife, cattle controls, industry commitment and improved programme governance. The Northern Ireland TB Strategic Partnership Group (TBSPG), an independent expert advisory body, was formed in 2014, and has published a series of recommendations to achieve a reduction and eventual eradication of bTB, as well as contributing to the Bovine Tuberculosis Eradication Strategy for Northern Ireland 2022.

A stakeholder group, the TB Partnership Steering Group (TBPSG), was formed in 2025 with the vision to introduce transformative, effective and evidence-based solutions to address bTB. In April 2025, the TBPSG produced the Bovine TB in Northern Ireland: Blueprint for Eradication, taking into account the CVO's review of bTB within Northern Ireland and building upon the DAERA Bovine Tuberculosis Eradication Strategy for Northern Ireland 2022.

2.4 Bovine TB in Northern Ireland: Blueprint for Eradication

The Blueprint for Eradication of bTB within Northern Ireland has been developed to achieve the aims of the TBPSG to reduce bTB herd incidence by 2% by 2030, in order to achieve a 50% reduction in the current bTB levels by 2040 and achieve eradication by 2050. The Blueprint sets out measures for three key areas: People, Cattle and Wildlife, and is based on the principle that a unified and multisectoral approach is required for the eradication of bTB. The three key areas are centred on five fundamental themes:

1. Enhanced disease surveillance and testing programmes
2. Regionalisation
3. Enhanced herd health and biosecurity measures
4. Wildlife
5. Herds with prolonged or recurring breakdowns

The eradication approach in the Blueprint consists of actions that can be implemented in the short, medium and long-term. The overarching approach centres on a unified "One Health" focus on the reciprocity between animal, human and environmental health, with mutual benefits within each of the components from the control and eradication of bTB. There are 34 measures within the Blueprint, with various timeframes for delivery; these are based within the following five sub-themes of the main overarching themes of the Blueprint and are further discussed in **Section 2.7**;

1. People, Partnership and Science – Changing the Culture
2. Cattle Intervention
3. Wildlife Intervention Measures
4. Regionalisation
5. Finance

2.5 Potential Wildlife Intervention Options

Achieving eradication of bTB is difficult. The diagnostic tests available for bTB fail to detect all instances of bTB, leading to residual infection amongst cattle herds, and owing to the high density of cattle, trading and farming practises within Northern Ireland, this can lead to the spread of infection amongst cattle. Furthermore, the bacterium *M. bovis* can persist in the environment for approximately six months within faeces and is transmissible to and from wildlife including deer and badgers.

2.5.1 Previous Wildlife Intervention Strategy Options

Previously, the Bovine Tuberculosis Eradication Strategy for Northern Ireland 2022 was subject to judicial review (initiated by the Northern Ireland Badger Group and Wild Justice) against DAERA regarding the decision to implement a non-selective cull of badgers by means of a controlled shooting, with this element of the previous Eradication Strategy overturned. This non-selective cull was formulated on the basis of intervention in areas of high badger population density that coincided with areas of high incidence of bTB herd breakdown. The non-selective culling was to take place through a phased approach. Phase 1 was due to operate for a period of up to 7 years of non-selective culling, although operationally it was expected that this would vary, with an initial cull period of 4 years anticipated with ongoing monitoring before determining if culling would continue. This was followed by the Phase 2 period of vaccination for 8 years.

2.5.1.1 Phase 1

DAERA proposed an amendment under Article 13 of The Diseases of Animals (Northern Ireland) Order 1981 for each intervention area. Article 13 allows a Power to destroy wildlife where it is indicated that the disease is being transmitted amongst wild members of a species and that the destruction of these wild members of a species is required to either eliminate or else substantially reduce the incidence of the disease in livestock. It was anticipated by DAERA that each intervention area would need to cover an area of approximately 100km^2 and that a total of 12 intervention areas would cover an area of no more than 1,200km^2. The criteria used to define these intervention areas were as follows;

- Established local cattle bTB hotspots;
- Above average badger social group density;
- Evidence of bTB in local badger population;
- Topography;
- Logistics; and
- Local knowledge.

Within the defined intervention areas, the cull method proposed was a controlled shooting of free-roaming badgers as well as shooting of cage-trapped badgers, where appropriate.

2.5.1.2 Phase 2

Following the completion of Phase 1 and the associated culling activities, Phase 2 proposed a period of vaccination. However, at that time DAERA was unable to complete a full option analysis for Phase 2 as the required vaccination period was to be informed by the use of badger vaccination as part of bTB control in England and the Republic of Ireland. A notional period of 8 years of vaccination was stated for the purpose of cost analysis; however, it was also noted that vaccination could continue indefinitely should the risk of bTB remain.

2.5.2 Review and development of Potential Wildlife Intervention Options

The eradication of bTB is challenging, compounded by its environmental persistence and the inaccuracies of diagnostic testing. The inclusion of cattle intervention measures in any eradication programme, as further outlined in **Section 2.7.2**, are required as foundational measures for the control and eradication of bTB. It has also been determined that infection within wildlife populations can contribute to the continuation and spread of disease amongst cattle. Within Northern Ireland, badgers have been recognised as a host of bTB, whilst there

have also been indications of infection amongst other species including deer. Typically, disease spread occurs on an intra-species transmission basis; however, there is potential for interspecies transmission to occur, e.g. from badgers to cattle or vice versa.

Research using whole genome sequencing has provided information regarding the transmission dynamics and the contributing sources of infection with bTB amongst cattle. It has indicated that there is evidence of *M. bovis* exchange between badgers and cattle. Assessments using road traffic accident survey data have estimated the prevalence of *M. bovis* within badgers at 20%, with further analysis showing similar strains as those identified within local cattle populations (Courcier et al., 2018).

DAERA acknowledges that Wildlife Intervention measures are necessary to address the spread of bTB. The proposed Wildlife Intervention Options have been determined by DAERA based on an examination of peer reviewed scientific evidence and the associated costs of deploying the potential Wildlife Intervention options which has included; peer-reviewed work by the TBSPG (supplied as Annex V to the Plan Consultation Document); DAERA's Annotated Scientific Bibliography (supplied as Annex VI to the Plan Consultation Document); DAERA scientific opinion on peer reviewed evidence in relation to the control of bTB (supplied as Annex VII to the Plan Consultation Document); the bTB Badger Intervention Options Analysis I (supplied as Annex VIII to the Plan Consultation Document); and the bTB analyses Calculations Assumptions (supplied as Annex IX to the Plan Consultation Document). Annex VI outlines that DAERA's opinion is that Wildlife Intervention measures are necessary as evidence supports that badgers and cattle form a two-host transmission system, and that modelling and genomic evidence confirms bi-directional transmission of *M. bovis* between them. Wildlife intervention is therefore considered by DAERA to be an essential component of any bTB eradication strategy. This work has also concluded that there are possible viable wildlife intervention options other than culling that could be deployed to address the role of badgers in bTB maintenance and spread.

Badgers are a protected species under the Bern Convention and are also protected under Northern Irish legislation. Should the introduction of Wildlife Intervention options be implemented, a Ministerial decision will be required by making subordinate legislation under the Disease of Animals Order 1981, or the Wildlife (NI) Order 1985 and amendment The Wildlife (Amendment) (Northern Ireland) Order 1995, or alternatively through the introduction of new primary legislation to facilitate this.

Following the judicial review of the Eradication Strategy in 2023, overturning its wildlife intervention policy, the judgement further ruled that DAERA must undertake additional consultation with regard to any future actions on Wildlife Intervention. The potential Wildlife Intervention Options have been further considered and developed by DAERA, informed by the wider strategic context and actions of the Blueprint. Consultation on the Wildlife Intervention Options aims to seek views on three potential options (and associated deployment methods i.e. cages, stopped restraints and controlled shooting), which DAERA consider viable to deal effectively with the transmission of bTB by wildlife (badgers), as part of wider efforts to eradicate bTB from Northern Ireland.

The Wildlife Intervention Options proposed are set out in the 'Consultation on the Department's potential Wildlife Intervention Options for the control of Bovine Tuberculosis in Northern Ireland' consultation document. Three potential intervention options are described for badgers, as follows:

- Non-selective culling;
- TVR (test and vaccinate or remove); and
- Vaccination only.

Further details on these Wildlife Intervention Options and their potential deployment methods are given in **Section 2.7.2** of this Environmental Report. A hybrid model may be deployed should DAERA select one or more intervention options as suitable for deployment in combination across Northern Ireland. If more than one intervention option is deemed suitable, DAERA may select an adaptable approach for the deployment of the intervention options, depending upon the disease situation in an area.

The consultation document notes information regarding the delivery method for the potential Wildlife Intervention Options and the potential for the introduction of lay vaccinators within Northern Ireland. Details regarding this are given in **Section 2.7**.

2.6 Scope of the Plan

2.6.1 Geographic Scope

The Plan is a national level programme for the eradication of bTB in Northern Ireland. As such, the assessment will primarily focus on activities occurring at a national to regional scale, while having careful regard to any likely significant environmental effects of a transboundary nature to receptors in the Republic of Ireland. The potential Wildlife Intervention options will focus on specific intervention areas which will be determined by DAERA in the future for the introduction of measures. These will be areas of high badger density and high incidence of bTB herd breakdown, as well as suitable physical boundaries limiting badger ranging behaviour and informed by local veterinary epidemiological assessment. The total area over which intervention would take place would not conflict with the protection afforded to protected species under the Bern Convention. Therefore, the total intervention area would not at any one time exceed 30% of the total agricultural land area in Northern Ireland.

2.6.2 Temporal Scope

The Plan aims to achieve the eradication of bTB from Northern Ireland through the implementation of a series of measures, such as enhanced cattle measures and testing, specific wildlife intervention options and amendments to the finance and funding associated with the bTB programme. The potential Wildlife Intervention measures outlined in the potential Wildlife Intervention Options consultation document aim to strengthen the bTB programme by introducing an intervention approach to address the spread of bTB from wildlife to cattle to contribute to the eradication of bTB and to help achieve Officially TB-Free status in Northern Ireland. Given the potential complexities associated with achieving Officially TB-Free status, the interim objective associated with the Wildlife Intervention measures is for a sustained reduction in the number of bTB herd breakdowns compared to the persistent disease elevation trend observed in recent years, within 15 years of commencement of the Wildlife Intervention measures.

The SEA of the Plan considers the potential for short, medium, and long-term effects of implementing the actions (including reference to secondary, cumulative, synergistic, permanent, and temporary, positive and negative effects), in line with the requirements of the SEA Directive. The timelines considered for assessment of effects have been identified as: short-term 0-1 years (immediate), medium-term 2-4 years and long-term beyond 4 years.

2.7 Description of the Blueprint and Potential Wildlife Intervention Options

2.7.1 Description of the Blueprint Actions for Appraisal

The Blueprint has advanced and updated the measures set out in the Bovine TB Eradication Strategy for Northern Ireland.

In general, the nature of the five sub-themes of the Blueprint have been considered as follows:

- People, Partnership and Science-Changing the Culture - The measures listed under this theme are largely administrative in nature and establish how the Blueprint and how the TBPSG group will function for research, governance and education.
- Cattle Interventions - This provides further measures for enhanced disease surveillance, improved cattle management, testing programmes and case management approaches to control bTB.
- Wildlife Intervention Measures - These are measures which aim to tackle TB within badgers, which will be subject to and influenced by strategic environmental assessment.
- Regionalisation - This represents small scale and localised pilot testing of measures and is not strategic planning. The measures to be tested will be assessed within strategic level Actions (e.g., cattle intervention, wildlife intervention).
- Finance - This is the introduction of measures to address financial compensation and deter fraud.

Table 2-1 summarises the measures included within the Blueprint and whether each measure has been assessed; detail is also provided on the timescale for measure implementation and the theme under which the measure falls.

Not all of the measures within the Blueprint have been assessed due to their administrative nature. Furthermore, some measures are considered unlikely to have significant environmental effects, with effects on SEA topics expected to be limited predominantly to Material Assets. Under the description of each of the proposed measures, a timescale for implementation of the components is included; for the remaining time period of the measures, this includes the monitoring, reviewing and continuous improvement of these.

Regarding proposed Wildlife measures, the Blueprint does not contain detailed information regarding specific measures for Wildlife Intervention, with this expanded information provided within the separate potential Wildlife Intervention Options consultation document. Information regarding the specific nature of the potential Wildlife Intervention Options for assessment are included in **Section 2.7.2**.

Table 2-1: Blueprint Actions for the control and eradication of bTB and whether they are assessed in the SEA

Sub-Theme	Blueprint Category	Description of Action	Included in SEA Assessment?
People, Partnership & Science – Changing the Culture	Governance & Partnership Working	*Short-term:* Establishment of new TB Partnership Steering Group and establishment of new cross cutting governance structures.	No – These actions are administrative in nature and determine how the group will function for research, governance and education purposes.
People, Partnership & Science – Changing the Culture	Independent Science Advice / Research & Development	*Short-term:* Evaluation options and develop strategy from the provision of independent science advice to inform bTB eradication in NI and implement preferred option. Identify future research priorities in conjunction with TBPSG. Consider partnerships with neighbouring jurisdictions to maximise impact of research. Formulate proposals for bTB related research projects under One Health commissioning process. *Medium-term:* Evaluate and review recently completed research projects to ensure the outputs are used to inform the development of future policy and eradication measures	No – These actions are administrative in nature and determine how the group will function for research, governance and education purposes.
People, Partnership & Science – Changing the Culture	Intergovernmental Collaboration	*Short-term:* Establish Chief Veterinary Officer led North-South bTB eradication forum. Establish UK and Ireland Chief Veterinary Officer forum for bTB eradication	No – These actions are administrative in nature and determine how the group will function for research, governance and education purposes.
People, Partnership & Science – Changing the Culture	Culture	*Short-term:* Develop and deliver enhanced communications strategy in partnership with stakeholders. *Medium-term:* Continue to deliver enhanced communications in partnership with stakeholders.	No – These actions are administrative in nature and determine how the group will function for research, governance and education purposes.
People, Partnership & Science –	Education and Knowledge Transfer	*Short-term:* Develop & commence implementation of an education and knowledge transfer programme for	No – These actions are administrative in nature and determine how the

Sub-Theme	Blueprint Category	Description of Action	Included in SEA Assessment?
Changing the Culture		both industry and herd keepers, with a focus on practical ways to mitigate against disease entry and transmission, through seminars, training courses and online information to support bTB eradication. *Medium-term:* Continue to implement a targeted knowledge transfer programme, incorporating any new measures and learning from feedback to increase its effectiveness.	group will function for research, governance and education purposes.
People, Partnership & Science – Changing the Culture	Programme Measures and Indicators	*Short-term:* Review programme disease measurements and indicators, including how they are shared and communicated both internally and externally, to support data driven decision making & continuous improvement.	No – These actions are administrative in nature and determine how the group will function for research, governance and education purposes.
Cattle Intervention	Field Surveillance and Testing	*Short-term:* Develop enhanced training for all vets involved in the bTB testing process, including awareness of the need for compliance with proper cold storage and transport of tuberculin. Review criteria used to monitor testing performance and roll out increased surveillance. *Medium-term:* Review the effectiveness of enhanced training, learning from feedback to increase its effectiveness. Review effectiveness of enhanced monitoring and supervision of tests and incorporate lessons learned to increase effectiveness.	Yes – Light touch SEA assessment with potential for effects on Material Assets, measures are, however, largely administrative.
Cattle Intervention	Abattoir Surveillance	*Short-term:* Deliver refresher training for all staff to ensure abattoir surveillance is vigorously applied.	Yes – Light touch SEA assessment with potential for effects on Material Assets
Cattle Intervention	Interferon Gamma (IFNg) Testing	*Short-term:* Review criteria for IFNg testing and evaluate possibility of introducing compulsory IFNg testing, with initial target of 24,000 tests per annum to protect herds from future risk of bTB breakdowns. Deliver pilot that extends testing window from 8 hours to 24 hours.	Yes – Light touch SEA assessment with potential for effects on Material Assets.

Sub-Theme	Blueprint Category	Description of Action	Included in SEA Assessment?
		Medium-term: Evaluate potential for introduction of a compulsory target to at least 36,000 tests per annum. *Long-term:* Evaluate potential for introduction of a compulsory target to at least 45,000 tests per annum.	
Cattle Intervention	Criteria for Officially Tuberculosis Free (OTF) Status	*Short-term:* Undertake preliminary work to consider the criteria for suspending or withdrawing OTF status, including legal advice as appropriate. *Medium-term:* Continue to develop proposals, incorporating legal advice, on the feasibility of further restricting herds.	Yes – Light touch SEA assessment with potential for effects on Material Assets.
Cattle Intervention	Inconclusive Skin Reactors (ICs)	*Short-term:* Develop and deliver proposals for managing inconclusive skin reactors.	Yes – Light touch SEA assessment with potential for effects on Material Assets.
Cattle Intervention	Full and Partial Depopulations	*Short-term:* Review depopulation policy, evaluate and implement proposals for restocking following depopulation. *Medium-term:* Review effectiveness of earlier proposals for restocking following depopulation, incorporating lessons learned to make improvements.	Yes – Light touch SEA assessment with potential for effects on Material Assets.
Cattle Intervention	Restocking after bTB Breakdown and Application of Severe Breakdown status	*Short-term:* Review criteria for the application of severe herd restrictions and associated impacts as regards to restocking. Evaluate and implement risk-based options for restocking breakdown herds. *Medium-term:* Review effectiveness of earlier proposals for restocking breakdown herds, incorporating lessons learned to make improvements.	Yes – Light touch SEA assessment with potential for effects on Material Assets.
Cattle Intervention	Herds with prolonged and recurring breakdowns	*Short-term:* Establish Taskforce to conduct an in-depth epidemiological investigation in herds with prolonged and recurring breakdowns and develop bespoke interventions and advice. Develop and implement pilot based on advice from the Taskforce.	Yes – Light touch SEA assessment with potential for effects on Material Assets, however largely administrative in nature.

Sub-Theme	Blueprint Category	Description of Action	Included in SEA Assessment?
		Medium-term: Review effectiveness, incorporate lessons learned and consider further roll out of Taskforce support service.	
Cattle Intervention	Whole Genome Sequencing	*Short-term:* Work with the Agri-Food and Biosciences Institute to expand and make greater use of data to better understand transmission pathways and support breakdown case management. Explore possibility for pilot projects to drive this forward. *Medium-term:* Integrate whole genome sequencing into case management and epidemiological investigations. Review any possible pilot project. *Long-term:* Consider further advances in genetic analysis to ensure bTB programme has available the full range of epidemiological information to make informed decisions on existing and future disease intervention strategies.	Yes – Light touch SEA assessment with potential for effects on Material Assets.
Cattle Intervention	Use of private/alternative tests by herd keepers	*Short-term:* Engage with DEFRA and DAFM regarding ongoing work on alternative testing strategies. Develop alternative testing policy. *Medium-term:* Explore potential for alternative test research trial. *Long-term:* Review findings and consider further roll out.	No – These actions relate to engagement with others to develop potential alternate testing options.
Cattle Intervention	Pembrokeshire project trial and risk rate	*Short-term:* Monitor and review the progress of the project and consider whether any lessons can be learned for NI bTB policy. *Medium-term:* Consider if the delivered outputs would benefit the NI bTB programme. Explore potential to trial a similar farmer and vet led concept for NI. *Long-term:* Consider options around categorization of bTB risks of animals in conjunction with other herd health parameters.	No – These actions are administrative in nature and determine how the Blueprint may be informed in the future from research.

Sub-Theme	Blueprint Category	Description of Action	Included in SEA Assessment?
Cattle Intervention	Machine Learning	*Short-term:* Explore the potential to develop proposals to utilise artificial intelligence, machine learning and disease modelling systems to identify high risk animals/herds and advance scenario planning interventions. *Medium-term:* Seek to implement any relevant proposals, advancing opportunities to build or adopt modelling to predict herds and animals that were infected with bTB by incorporating data directly and indirectly related to the animal's bTB infection risk.	No – These measures relate to the use of machine learning for modelling purposes.
Cattle Intervention	Breakdown Case Management	*Short-term:* Review current bTB case management approach, (including deployment of adequate resources) and develop veterinary led proposals to improve current approach. *Medium-term:* Review effectiveness of earlier proposals, incorporating lessons learned to improve approach.	No – These measures relate to reviewing existing management approaches and to develop new proposals on bTB case management.
Cattle Intervention	Legislative powers to test non-bovines for bTB	*Short-term:* Draft legislation to extend non-bovine testing powers to farms with no cattle present (e.g. those contiguous to cattle farms). *Medium-term:* Subject to consultation, progress the necessary legislative amendments.	Yes – Light touch SEA assessment with potential for effects on Material Assets, however dependent on legislative powers being available.
Cattle Interventions	Restrictions and risk-based trading	*Short-term:* Evaluate options for pre & post movement testing and develop proposals to ensure compliance with legislative requirements. Develop & commence implementation of proposals for informed purchasing, including information sharing and mapping requirements. *Medium-term:* Evaluate effectiveness of earlier proposals, incorporating lessons learned to improve approach. Explore options for further sharing of information on bTB herd classification.	Yes – Light touch SEA assessment with potential for effects on Material Assets.

Sub-Theme	Blueprint Category	Description of Action	Included in SEA Assessment?
		Long-term: Consider potential for the introduction of additional restrictions. Continue to evaluate effectiveness of earlier proposals, incorporating lessons learned to improve approach.	
Cattle Intervention	Movements out of bTB breakdown herds under certain conditions	*Short-term:* Review criteria for Alternative Control Herds (ACH) and roll out ACH approvals. *Medium-term:* Review effectiveness of earlier proposals, incorporating lessons learned to improve approach.	No – these actions appear to be administrative in nature and may help inform future actions under the Blueprint.
Cattle Intervention	Genetics	*Short-term:* Explore the potential to promote breeding for bTB resistance through engagement with industry and the Ruminant Genetics Programme. Advance genetics knowledge transfer and communications strategy.	No – these actions are research based in nature.
Cattle Intervention	Herd Health Management & Biosecurity Advice	*Short-term:* Develop proposals for providing biosecurity advice by/to industry and aligning herd health & biosecurity with other DAERA animal health programmes & wider programmes. Implement a fit for purpose biosecurity assessment protocol. *Medium-term:* Review effectiveness of earlier proposals, incorporating lessons learned to improve approach. Consider proposals that align herd health & biosecurity with other DAERA programmes and industry programmes and priorities.	Yes – Potential for effects on Material Assets and Biodiversity, Flora and Fauna through improved biosecurity.
Cattle Intervention	Capital grants for safe and effective on farm testing facilities and biosecurity improvements	*Short-term:* Explore options for providing grant aid to improve animal handling/testing facilities and to undertake works aimed at improving biosecurity as part of the wider DAERA sustainable agriculture programme *Medium-term:* Subject to finance availability, implement scheme	Yes – Light touch SEA assessment with potential for effects on Material Assets.
Cattle Intervention	Statutory Biosecurity Improvement Notices	*Short-term:* Explore options for minimising disease spread through poor biosecurity practices. *Medium-term:* Further develop options, bring for Ministerial	No – these measures are largely administrative in nature and relate to the legislative approach for biosecurity practices and management.

Sub-Theme	Blueprint Category	Description of Action	Included in SEA Assessment?
		consideration and legislate as appropriate on the preferred approach. *Long-term:* Proceed to implement and operationalise any agreed measures relating to Biosecurity Improvement Notices.	
Cattle Intervention	Farm Fragmentation	*Short-term:* Explore options for minimising disease spread from farm fragmentation. *Medium-term:* Further develop options, bring for Ministerial consideration and legislate as appropriate on the preferred approach. *Long-term:* Proceed to implement and operationalise any agreed measures.	No – these measures are largely administrative in nature and relate to the legislative approach for biosecurity practices and management.
Wildlife	Wildlife Intervention	*Short-term:* Bring forward proposals for effective, evidence based wildlife interventions and TBPSG views for consideration by Minister. Consult on proposals as agreed by the Minister and taking into account requirements from the judicial review decision of October 2023. Following Ministerial consideration, progress any possible necessary legislation to give effect to preferred approach and commence implementation. *Medium-term:* Continue to implement and operationalise any agreed measures. *Long-term:* Continue to implement and operationalise any agreed measures.	Yes – Potential for effects on SEA topics of Biodiversity, Flora and Fauna, Population and Human Health Air, Climate and Material Assets.
Wildlife	Badger RTA Survey	*Short-term:* Develop strategies and policies to optimise use of data arising from badger RTA survey to enable evidence-based decision making. *Medium-term:* Implement any agreed policy	Yes – Potential for effects on SEA topics of Biodiversity, Flora and Fauna and Material Assets.
Wildlife	Badger Sett App	*Short-term:* Develop and launch a secure, user-friendly App that	Yes – Potential for effects on SEA topics of

Sub-Theme	Blueprint Category	Description of Action	Included in SEA Assessment?
		enables farmers and the public to record badger setts.	Biodiversity, Flora and Fauna and Material Assets.
Wildlife	Role of Deer	*Short-term:* Develop proposals to evaluate further the role of deer in the transmission and persistence of bTB. *Medium-term:* Consider and agree proposals and commence preparation for implementation.	Yes – Potential for effects on SEA topics of Biodiversity, Flora and Fauna and Material Assets.
Regionalisation	Regionalised Approach	*Short-term:* Develop a 'Proof of Concept' pilot for delivering a holistic package of measures (wildlife, cattle, people) on a regionalised basis. Commence preparations for roll out. Commence implementation of regionalised pilot approach.	No – This represents small scale and localised pilot testing of measures and is not strategic planning. The measures to be tested will be assessed within strategic level Actions (e.g., cattle intervention, wildlife intervention).
Finance	Finance	*Short-term:* Consider and evaluate options for financial sustainability for both farm businesses and government, including the potential reform of compensation. TBPSG will explore possible options for financial support, beyond compensation for cattle slaughtered for disease control, to farmers experiencing a bTB breakdown. *Medium-term:* Consult on potential proposals for the reform of compensation and finance reform of the Programme, seek Ministerial endorsement and prepare legislative basis for any agreed proposals. *Long-term:* Proceed to implement and operationalise any agreed measures.	No – This represents economic considerations that are not directly considered by SEA assessment.
Finance	Fraud	*Short-term:* Review existing control measures and develop proposals that ensure that all available tools and enforcement activities are being fully utilised to deter and mitigate the risk of any fraudulent activity.	No – This represents economic considerations that are not directly considered by SEA assessment.

2.7.2 Description of the Potential Wildlife Intervention Options for Appraisal

As the Wildlife Intervention Options proposed in the 2022 Eradication Strategy were overturned, further research and work have since taken place to develop the options set out in the potential Wildlife Intervention Options consultation documentation. This wildlife intervention information represents a more detailed consideration of a subset of the proposed Wildlife Actions established in the Blueprint.

The overall long-term aim of the potential Wildlife Intervention Options is to reduce the spread of bTB disease originating from wildlife to contribute to the eradication of bTB and to assist in achieving an 'Officially TB-Free' status for Northern Ireland. Given the timescales observed within other countries implementing TB eradication strategies, it is likely that eradication may be achievable over the next 30-40 years. Within the short-term, the potential Wildlife Intervention Options objectives are to reduce the instances of bTB herd breakdowns within fifteen years of programme commencement. Due to the ongoing monitoring, review and potential for continuous improvement, it is likely that amendments to the exact measures and design of Wildlife Intervention Options will occur over this period.

DAERA notes that the use of wildlife intervention options without suitable cattle intervention measures to control bTB will not result in an effective reduction in bTB levels in cattle, and that both intervention strategies must occur in parallel.

Within the consultation document, DAERA considers three wildlife intervention options for badgers that are considered to be scientifically viable for implementation following advice from the Veterinary Service & Animal Health Group (VSAHG), Northern Ireland Environment Agency (NIEA) and DAERA's Chief Scientific Adviser. These are:

- Non-selective culling;
- TVR (test and vaccinate or remove); and
- Vaccination only.

A hybrid model may be deployed should DAERA select one or more intervention options as suitable for deployment in combination across Northern Ireland. If more than one intervention option is deemed suitable, DAERA may select an adaptable approach for the deployment of the intervention options, dependent upon the disease situation in an area.

All proposals set out in the potential Wildlife Intervention Options consultation document have been assessed in **Section 7.2** of this SEA Environmental Report.

2.7.2.1 Timing, Scale and Application of Wildlife Intervention Options

2.7.2.1.1 Selection and Scale of Intervention Areas

As noted in **Section 2.6.1**, specific intervention areas may be selected by DAERA where there is evidence of badgers contributing to ongoing bTB infections in cattle. The selection of areas will also be influenced by the following factors:

- Long-term elevated levels of bTB infection within cattle herds;
- Higher than average badger social group density;
- Evidence of bTB infection within local badgers;
- Local veterinary and epidemiological information; and
- Natural or physical boundaries limiting badger movements e.g. rivers or major road networks.

The specific size and configuration of each intervention area will depend on the local conditions; these areas will cover at least 100km^2 and, where possible, will use natural or physical boundaries to define the area and limit badger movement. The cumulative area over which intervention takes place would not conflict with the protection afforded to protected species under the Bern Convention; therefore, the total intervention area at any one time would not exceed 30% of the total agricultural land area in Northern Ireland.

2.7.2.1.2 Intervention Period

DAERA has proposed a five-year intervention period for the use of Wildlife Intervention measures based on evidence from previous TVR trials (Menzies et al., 2021), modelling (Smith et al., 2013) and experience from other countries, as it is expected that at least five years' duration is required to achieve disease control outcomes. Continuous review of the intervention will occur following commencement, with any future approach following the initial period to be informed by surveillance data, disease trends and emerging scientific evidence.

2.7.2.1.3 Intervention Window

The intervention window defines the period each year during which implementation of the potential Wildlife Intervention measures will be permitted, including trapping, vaccination or culling.

DAERA considers the intervention windows used in other jurisdictions and lessons and how these can inform the approach in Northern Ireland. In the Republic of Ireland, badger interventions are permitted in newly established intervention areas from 1 April to 31 January with the use of trapping. The use of trapping is permitted year-round in established intervention areas. In England, the window varies by intervention type and capture type; cage trapping and shooting is permitted from 1 June to 30 November, controlled shooting from 1 June to 31 January, and cage trapping for vaccination purposes from 1 May to 30 November.

In Northern Ireland, the existing intervention window (open season) runs from 1 July to 30 November and has been in place for over 30 years. The start date of 1 July is based on evidence that badger sows (females) tend to give birth from mid-January to mid-March, with a weaning period of around 12 weeks for the badger cubs. The end date of 30 November is intended to prevent disturbance to pregnant sows from December onwards.

In the consultation document DAERA note that, following option selection, there may be future consideration regarding extension of the open season, which could be beneficial regardless of the capture method selected, by increasing the likelihood that sufficient animals will be captured. This could increase the rate by which the overall badger infection load in an area is reduced. Any consideration to extend the intervention window would be assessed against the potential welfare implication and the value linked to the type of intervention being deployed, i.e. consideration should be given to the potential culling of pregnant or nursing female badgers with cubs located underground within setts.

2.7.2.2 Potential Wildlife Intervention Options

DAERA proposes to undertake a characterisation exercise to determine specific areas for intervention prior to the commencement of any intervention strategies. As described previously, these will be a minimum size of 100km^2 and will ideally be bounded by a significant natural or man-made boundary. A previous exercise to determine intervention areas in 2017, identified a total area of 1,200km^2. The three options (non-selective culling, TVR, or vaccination only) are considered by DAERA as scientifically supported and it is noted by DAERA that, for the effective achievement of bTB reduction and eradication, the introduction of these measures must be coupled with the introduction of cattle intervention methods to control bTB, as proposed by the Blueprint actions within the Plan.

Regarding badger welfare, the Scientific Opinion on the Available Evidence on Badger Intervention noted that all capture measures raised welfare and ethical concerns. It was noted that when the deployment of cage trapping and restraints occurred to a high standard, that these caused minimal injury but were categorised as having only intermediate welfare scores. Any deployment method used will likely give rise to concerns on animal welfare and ethics which must be satisfied by the provision of sufficient controls to protect welfare and ensure that any deployment method is humane.

The methods of controlled shooting, cages and stopped restraints have been used in other jurisdictions. DAERA stipulates that any introduced intervention option must be humane and will require robust protocols and training regimes to ensure compliance with an agreed set of welfare standards and be subject to continual monitoring and verification.

The potential Wildlife Intervention Option measures that could be introduced within the intervention areas are described below in **Sections 2.7.2.2.1** to **2.7.2.2.3**. A hybrid model may also be deployed should DAERA select one or more intervention options as suitable for deployment in combination across Northern Ireland. If more than one intervention option is deemed suitable, DAERA may select an adaptable approach for the deployment of the intervention options, dependent upon the disease situation in an area.

2.7.2.2.1 Non-Selective Culling

This option involves a period of non-selective culling of 70% of the badger population within the intervention area, with an aim to reduce the infection burden within the local badger populations and reduce transmission risk. Subject to delivery, coverage and local epidemiology, this would be deployed within identified intervention areas of at least 100km^2.

Non-selective culling has not previously taken place within Northern Ireland but has been deployed in both England and the Republic of Ireland.

The delivery method for the non-selective cull may be via controlled shooting (whereby shooting occurs of free roaming badgers) or cage trapping or the use of stopped restraints followed by controlled shooting of captured badgers.

2.7.2.2.2 Test and Vaccinate or Remove (TVR)

The Test and Vaccinate or Remove (TVR) option involves the field trapping of badgers, with a targeted cull. Trapped badgers would be anaesthetised, with blood drawn from their jugular vein for testing using a sett-side Dual Platform test for the presence of bTB. Results are obtainable typically within 20 minutes. Where the badgers test negative, they would be vaccinated using the Bacillus Calmette-Guérin (BCG) vaccine and then released. These badgers would also be microchipped before release. Badgers testing positive for bTB would be culled via humane lethal injection. This would occur in intervention areas of at least 100km^2. There has not been a comprehensive deployment of the TVR approach on a 100km^2 area basis beyond research to date.

The trapping of badgers would occur using trained lay operatives, with the testing and subsequent vaccination or removal carried out by veterinarians. The process of TVR would be repeated each year throughout the intervention period and captured badgers testing negative would be revaccinated each year.

TVR would be deployed using either cage trapping or the use of stopped restraints.

2.7.2.2.3 Vaccination Only

No selective or prior culling or testing for bTB infection of badgers would occur under this approach. This option would involve the trapping of badgers within the identified intervention area of at least 100km^2, with all trapped animals then vaccinated using the BCG vaccine. No removal of infected badgers would occur under this approach. This intervention method would be deployed using cage trapping or the use of stopped restraints.

DAERA has noted that there are likely to be long timescales involved with the implementation of the vaccination only approach to achieve coverage that is comparable to approaches involving culling. The use of vaccination only would not protect already infected badgers, and a sufficient proportion of the local badger population, estimated in some modelling studies at around 30-40% of the badger population, would need to be vaccinated each year to achieve badger herd immunity , but this outcome was predicated on a programme of culling that had reduced badger bTB prevalence (Smith and Delahay, 2018, Robertson et al., 2025). The required level of vaccine coverage would be dependent on the underlying bTB prevalence within the badger population and would therefore be indirectly affected by any previous interventions that had taken place within the area (Smith and Budgey, 2025).

Vaccination-only approaches are now being employed in England following several culling interventions. The Republic of Ireland has also moved towards using vaccination, however, culling still occurs where deemed necessary based on epidemiological evidence.

2.7.2.3 Deployment Methods for the Potential Wildlife Intervention Options

All of the wildlife intervention options require live capture of badgers, aside from the controlled shooting of free roaming badgers under the non-selective culling option (noting that this intervention option may also use live capture trapping where it is required due to the terrain).

The following three deployment methods may be used for the potential Wildlife Intervention Options:

1. Controlled shooting of free roaming badgers (non-selective culling only);
2. The use of cage trapping (applicable to any intervention option); and

3. The use of stopped restraints (applicable to any intervention option).

Across all of the potential Wildlife Intervention Options, the trapping methods are consistent, however the outcome may differ e.g. use of shooting in the non-selective culling option, or use of lethal injection following a bTB positive test result under the TVR option.

2.7.2.3.1 Controlled Shooting of Free Roaming Badgers (Supplemented by either cage trapping or stopped restraints)

Trained marksmen (having completed a necessary training course) would be deployed to shoot free roaming badgers within the intervention area from dusk to dawn. All persons shooting badgers would need to be competent in the use and safe handling of firearms and would be required to demonstrate an appropriate level of marksmanship through Departmental-approved training. In England, controlled shooting was the prominent intervention method selected and was supplemented by cage trap shooting where appropriate. Should controlled shooting be selected in Northern Ireland, it would follow the practice used in England but may be supplemented by stopped restraints rather than the use of baited cages that was employed in England (DEFRA, 2022a).

2.7.2.3.2 Cage Trapping

The deployment of cage trapping involves digging specially designed cages into the ground close to badger setts or other locations where there is evidence of badger activity. Bait is placed within the cages nightly in the pre-baiting phase to encourage the badgers to freely enter and become accustomed to the cages. Following the pre-baiting phase, the cages are then baited and set to close. The cages are checked early each morning to ensure the timely handling of any captured animals. DAERA considers that, as there is an absence of natural predators for badgers in Northern Ireland, there is no notable welfare differences in relation to predation risk of badgers between the use of cages or stopped restraints. Baited cages have been previously employed in Northern Ireland during the five-year TVR research project and have also been previously employed in England (DEFRA, 2022b).

2.7.2.3.3 Stopped Restraints

Stopped restraints (also known as stopped body restraints), are a specially designed device comprised of multistrand steel cable around a core nylon filament, which increases the flexibility of the restraint. The restraints are fitted with a stop (self-locking mechanism), which prevents the restraint from closing beyond a minimum circumference of 28-30cm in order to prevent harm to a limb or to a non-target animal species. The restraints are anchored into the ground via a stout bar and a short chain to enable a degree of movement for the restrained badger, and a swivel is also fitted to reduce the degree of cable twisting (Bryne et al., 2015). No pre-baiting is used with this deployment method as the badger is not aware of the restraint until it is captured. The stopped restraints are checked early each morning to ensure timely handling of any captured animals. As previous DAERA considers that there are no notable welfare differences in relation to predation risk of badgers between the use of cages or stopped restraints. Stopped restraints have been used in the Republic of Ireland for several decades.

2.7.2.4 Non-Selective Culling Options

This option involves non-selective removal of badgers by shooting within an identified intervention area of at least 100km^2. This approach aims to decrease the overall infection burden among badgers through population reduction which, in turn, is intended to lower the incidence rate of bTB in cattle. This involves decreasing the local badger population within the intervention area by up to 70%. There is no testing of badgers prior to culling and all are subject to removal, irrespective of infection status. There are three methods for the deployment of a non-selective cull:

1. Non-selective cull using controlled shooting of free roaming badgers supplemented by cage trapping;
2. Non-selective cull using cage trapping;
3. Non-selective cull using stopped restraints.

2.7.2.4.1 Non-selective cull using controlled shooting of free roaming badgers supplemented by cage trapping

This intervention approach aims to steadily reduce the number of badgers in an identified intervention area of at least 100km^2. As badgers are a nocturnal species, it is intended that all operations using this approach would be conducted during night-time hours to align with the animals' natural behaviour patterns over a six-week period. In this method death can be instantaneous and the badgers would not be held captive. However, controlled shooting can present notable humaneness challenges due to the difficulty of ensuring an immediate, clean kill in badgers. For this reason, controlled shooting would be subject to detailed protocols governing training, marksmanship standards, equipment, operating distances and follow-up procedures.

While culling by controlled shooting of free roaming badgers was the prominent method used in England, some badgers were removed by cage trap and shoot, particularly in areas where the terrain was not suited for controlled shooting. If controlled shooting is implemented in Northern Ireland, it would follow the best practices used in England (DEFRA, 2022a). In smaller subareas within the intervention area where this method may not be suitable due to terrain i.e. dense vegetation, the methodology provides for supplemental live capture. Following this initial period, any future approach would be informed by surveillance data, disease trends and emerging scientific evidence which DAERA would consider at that time.

Badger Welfare

The primary objective for controlled shooting is to ensure that the badger dies instantaneously or as close as possible, however achieving consistent outcomes may be influenced by factors such as terrain, visibility, badger behaviour and shot placement. An Independent Expert Panel (IEP) report on the 2013 pilot culls in England found that between 7.4% and 22.8% of badgers were estimated to still be alive more than five minutes after being shot (IEP, 2014). There was also the possibility of injured animals not being located, leading to unnecessary suffering. The IEP made recommendations to further improve humaneness and reduce wounding rates, and the English best-practice guides were strengthened in response to IEP recommendations to mitigate against these risks in future culls (DEFRA, 2022a). For this reason, controlled shooting would be subject to detailed protocols governing training, marksmanship standards, equipment, operating distances and follow-up procedures.

Mitigation measures identified by DAERA to improve humaneness include high field-marksmanship standards, the use of thermal imaging to support accurate shot placement and provide clear guidance on optimal shot placement. Badgers must be at least 25m away from a sett, and away from dense cover before taking a shot and advice is also given for checking for signs of life within five minutes of taking a shot. Although free shooting meets acceptable welfare criteria evidence suggests that overall welfare standards are higher by using cages and stopped restraints (IEP, 2014).

2.7.2.4.2 Non-selective cull using cage trapping

This intervention approach aims to reduce the number of badgers within an identified intervention area (of at least 100 km²) through the use of baited cage trapping. Following a completed georeferenced survey of setts, baited cage trapping would commence using a standardised two-week cycle approach.

This methodology is intended to be delivered by private sector operators who have successfully completed DAERA-approved training and demonstrated the required competency standards. The deployment process involves the installation of specially designed cages, which are dug into the ground close to badger setts and other locations where clear signs of badger activity are present. Cages are pre-baited and the cage doors are secured open, allowing free movement and enabling badgers to become accustomed to entering the cages. After this pre-baiting phase, the cages are set to close over, allowing any badgers that enter to be captured. Cages are inspected early each morning to ensure the prompt handling of any captured animals. Badgers captured in cages, the design of which allows for the capture of badgers of all sizes and ages.

Every badger caught would be killed humanely, by lethal gunshot while in the cage. Trappablility: Within the TVR trial, around 55% of the badger population was caught every year, with the implementation of culling the overall population of badgers within the intervention area will reduce each year with a percentage reduction in the population trapped accordingly as no recapture occurs with this intervention option. Approximately 10–13% of badgers may be "cage shy," reducing the overall efficacy of this approach (Smith and Cheeseman, 2007). This approach has previously been implemented in England, where it was used to supplement free shooting in

certain areas. Following this initial period, any future approach would be informed by surveillance data, disease trends and emerging scientific evidence which DAERA would consider at that time.

Badger Welfare

Cage trapping, when conducted to a high professional standard, is linked to low rates of injury among captured badgers. A study involving 1,500 cage-trapped badgers reported that 97% of the animals showed no signs of injury following capture, indicating that this method is generally safe and humane (Menzies et al., 2021). The remaining 3% sustained minor injuries. Cage traps have been used in England to complement controlled shooting, as well as in the earlier large-scale research programme (the RBCT). Evidence from the RBCT showed that 88% of badgers sustained no detectable injuries while confined in the trap. Of the 12% that did show injuries, the majority experienced minor skin abrasions (72% of 12% = 8.6% of all badgers). A small proportion (1.8% of the total) sustained tooth or jaw damage. Subsequent modifications to the trap door design were found to reduce the incidence of tooth damage. To uphold these welfare standards, all cages should be checked early each morning. This is intended to ensure any badger caught is handled promptly and humanely, reducing stress and further safeguarding animal welfare.

2.7.2.4.3 Non-selective cull using stopped restraints

This intervention approach aims to reduce the number of badgers within an identified intervention area of at least 100 km² through the use of stopped body restraints. Following a completed georeferenced sett survey, stopped restraint trapping would commence within the identified intervention area. This method is designed to be implemented by private operators. All restraints are inspected every morning after daybreak, and any badger captured is humanely killed while still restrained by lethal gunshot.

Unlike cage-based approaches, stopped body restraints do not require pre-baiting, as the animal is unaware of the device prior to capture. The restraint incorporates a self-locking mechanism which is designed to limit closure to a minimum circumference, allowing the animal to be held without overtightening. The swivel and anchor system enables some movement while the animal remains restrained. Restraints are checked early each morning to ensure the timely handling of any captured animals.

However, stopped restraints are not as effective for trapping smaller, younger badgers. This limitation arises from the fixed minimum size of the restraint, designed to prevent overtightening on adult badgers. Therefore, as younger badgers often do not reach the necessary size and weight to be captured by this method until at least late September this method may be supplemented by cage trapping in the earlier part of the intervention period, or future consideration given to extending the intervention window.

Stopped restraints do not require pre-baiting and can be deployed across an intervention area with relatively limited preparation when compared with cage-trapping approaches. They are also easier to deploy physically and logistically. Stopped restraints as a capture method has been widely implemented throughout the Republic of Ireland, where it has been carried out by a private company resulting in substantial operational experience with mean trappability estimated to be 34–35% per session (annual capture rate: 56–58%) (Byrne et al., 2012). Additionally, stopped restraints help avoid the challenges associated with "cage shy" badgers, which can reduce the overall effectiveness of cage trapping methods.

Following this initial period, any future approach would be informed by surveillance data, disease trends and emerging scientific evidence which DAERA would consider at that time.

Badger Welfare

In terms of animal welfare outcomes associated with stopped restraints, evidence indicates that, when these devices are properly monitored, most animals experience either no injuries or minor injuries such as superficial hair or skin compression. Data from the Republic of Ireland, where post-mortem assessments were carried out on more than 18,500 badgers captured in stopped restraints, found that there were no restraint-related deaths among the captured animals, and that 84% of the badgers showed either no injuries or only superficial hair/skin compression. However, it was observed that the incidence of minor injuries increased with the length of time the animals spent in the restraints, underscoring the importance of continued vigilance regarding animal welfare during the use of this capture method. To mitigate against potential injury or predation stopped restraints should be checked promptly each morning to reduce the length of time any badger is kept in the restraint.

2.7.2.5 Test and Vaccinate or Remove (TVR)

The Test and Vaccinate or Remove (TVR) approach involves the live capture of badgers within an intervention area of at least 100km^2. The TVR method removes individual badgers that have tested positive to the trap side test from within the population while simultaneously promoting herd immunity among the remaining badgers through vaccination with the BCG vaccine. This dual approach aims to reduce future disease transmission and improve the health and immunity of the badger population within the intervention area. Once captured, badgers are anaesthetised to enable a blood sample to be safely obtained. This sample is then tested for bTB using a trap-side diagnostic tool, the DPP test. The test provides results within 20 minutes and has an estimated whole blood sensitivity of 69%, specificity of 98% (Arnold et al., 2021). Badgers that test negative for bTB are vaccinated, microchipped and released back into their habitat. In contrast, badgers that test positive for bTB are humanely culled through lethal injection. There are two approaches for the deployment of TVR:

1. TVR using baited cages; and
2. TVR using stopped restraints.

2.7.2.5.1 TVR using baited cages

This TVR method involves using baited cages to trap badgers within an identified intervention area of least 100km^2. Following a completed georeferenced sett survey, baited cage trapping would commence using a standardised two-week cycle approach. This methodology is designed to be delivered by private sector operators who have successfully completed DAERA-approved training and demonstrated the required competency standards.

The deployment process involves the installation of specially designed cages, which are dug into the ground close to badger setts and other locations where clear signs of badger activity are present. Cages are pre-baited and the cage doors are secured open, allowing free movement and enabling badgers to become accustomed to entering the cages. After this pre-baiting phase, the cages are set to close over, allowing any badgers that enter to be captured. Cages are inspected early each morning to ensure the prompt handling of any captured animals.

Badgers captured in cages are protected from predators while confined, and the cage design allows for the capture of badgers of all sizes and ages. All captured badgers are uniquely identified, anaesthetised and tested using a trap side test (Arnold et al., 2021). Badgers that test negative for bTB are vaccinated with a BCG vaccine and then released. Badgers that test positive for bTB are humanely euthanised via lethal injection. Trappablility: Based on the NI TVR trial, it is expected that, around 55% of the badger population is caught in the first year, and about half of those are caught again the following year. However, expert opinion indicates that approximately 10–13% of badgers may be "cage shy," reducing the overall efficacy of this approach (Smith and Cheeseman, 2007). Badgers may be captured by lay persons who are suitably trained, however the anaesthetisation, testing, euthanasia or vaccination and microchipping must be carried out by a veterinary professional.

Following this initial period, any future approach would be informed by surveillance data, disease trends and emerging scientific evidence which DAERA would consider at that time.

Badger Welfare

Welfare considerations for the use of cages for trapping are described in **Section 2.7.2.4.2**.

The TVR approach minimises disruption to the broader badger population by targeting only those animals that are confirmed to be infected with bTB. As a result, healthy badgers are vaccinated and released, which helps maintain population stability and reduces the potential disturbance within the social structure of the species. The removal of infected animals has a reducing effect on the infection pressure in the population. Test positive badgers are euthanised via lethal injection while still under anaesthetic.

2.7.2.5.2 TVR using stopped restraints

This TVR method involves using stopped body restraints to trap badgers within an identified intervention area of least 100km^2. Following a completed georeferenced sett survey, stopped restraint trapping would commence within the identified intervention area. This method is designed to be implemented by private operators.

All restraints are inspected every morning after daybreak to ensure timely handling of any captured animal. Unlike cage-based approaches, stopped body restraints do not require pre-baiting, as the animal is unaware of the device prior to capture. The restraint incorporates a self-locking mechanism that prevents overtightening once activated, and the swivel and anchor system enables some movement while the animal remains restrained. However, stopped body restraints are not as effective for trapping smaller, younger badgers. This limitation arises from the fixed minimum size of the restraint, designed to prevent overtightening on adult badgers. Therefore, as younger badgers often do not reach the necessary size and weight to be captured by this method until at least late September this method may be supplemented by cage trapping in the earlier part of the intervention period, or future consideration given to extending the intervention window. The absence of a pre-baiting requirement enables stopped body restraints to be deployed swiftly and efficiently in the field when compared with cage-trapping approaches. Badgers may be captured by lay persons who are suitably trained, however the anaesthetisation, testing, euthanasia or vaccination and microchipping must be carried out by a veterinary professional.

Stopped body restraints as a capture method has been widely implemented throughout the Republic of Ireland, where it has been carried out by a private company resulting in substantial operational experience with this method. During the five-year intervention, badgers that test negative for bTB are vaccinated with BCG vaccine and then released. Badgers that test positive for bTB are humanely removed via lethal injection, mean trappability was estimated to be 34–35% per session (annual capture rate: 56–58%; across the population) (Byrne et al., 2012). Additionally, stopped body restraints help avoid the challenges associated with "cage shy" badgers, which can reduce the overall effectiveness of cage trapping methods.

Following this initial period, any future approach would be informed by surveillance data, disease trends and emerging scientific evidence which DAERA would consider at that time.

Badger Welfare

Welfare considerations for the use of stopped restraints for trapping are described in **Section 2.7.2.4.3**.

The TVR approach minimises disruption to the broader badger population. Unlike non-selective culling methods, TVR targets only those animals that test positive for bTB. As a result, healthy badgers are vaccinated and released, which helps maintain population stability and does not disturb the social structure of the species (Menzies et al., 2021). The removal of infected animals has a reducing effect on the infection pressure in the population. Test positive badgers are euthanised via lethal injection while still under anaesthetic.

2.7.2.6 Vaccination Only

A vaccination only approach relies exclusively on vaccination as the mechanism for reducing disease transmission and does not include any lethal measures. Under this approach, all badgers that are captured within the intervention area are vaccinated without any testing taking place and are subsequently released back into the local environment. As a result, both uninfected and potentially infected badgers remain within the population following capture, vaccination and release.

The primary objective of vaccination only is to increase herd immunity within the badger population over time through repeated and consistent vaccination. By increasing the proportion of immune animals, this approach aims to reduce the infection burden and slow the transmission of bTB between badgers and, indirectly, to cattle. However, vaccination does not provide a therapeutic benefit to animals that are already infected. Consequently, under a vaccination only approach, potentially infected badgers are vaccinated but remain in the population, limiting the immediate epidemiological benefit of this intervention.

Modelling outputs and field experience indicate that while badger intervention can reduce bTB levels, approaches that include a lethal component, whether proactive or selective, tend to provide a faster reduction in disease prevalence and transmission than vaccination only. This difference reflects the fact that removal-based interventions directly reduce the pool of infectious animals, whereas vaccination only acts more gradually by modifying population susceptibility over time (Smith and Budgey, 2025).

For vaccination to have a meaningful population-level impact, a sufficiently high and sustained proportion of the badger population would need to be vaccinated over multiple years to achieve herd immunity (Smith and Delahay, 2018, Robertson et al., 2025). Vaccination only would not protect already infected animals and a sufficient proportion, estimated in some modelling studies at around 30-40% of the badger population, would need to be vaccinated each year to achieve badger herd immunity, but this outcome was predicated on a programme of culling that had reduced badger bTB prevalence. Therefore, required vaccine coverage is dependent on underlying badger TB prevalence in the area and is therefore indirectly affected by potential previous interventions that might have taken place in that area (Smith and Budgey, 2025). Available evidence indicates that a vaccination only approach may need to be sustained over a prolonged period and delivered at high coverage to achieve its intended effect.

2.7.2.6.1 Vaccination Only using baited cages

This vaccination only method involves using baited cages to trap badgers within an identified intervention area. Following a completed georeferenced sett survey, baited cage trapping would commence using a standardised two-week cycle approach. This methodology is designed to be delivered by private sector operators who have successfully completed DAERA-approved training and demonstrated the required competency standards.

The deployment process involves the installation of specially designed cages, which are dug into the ground close to badger setts and other locations where clear signs of badger activity are present. Cages are pre-baited and the cage doors are secured open, allowing free movement and enabling badgers to become accustomed to entering the cages. After this pre-baiting phase, the cages are set to close over, allowing any badgers that enter to be captured.

Cages are inspected early each morning to ensure the prompt handling of any captured animals. Badgers captured in cages are protected from predators while confined, and the cage design allows for the capture of badgers of all sizes and ages. During the five-year intervention every badger caught is vaccinated and marked. This is done without anaesthetic. No testing takes place.

At present only a veterinarian can vaccinate a badger in Northern Ireland, whereas in England and Wales trained lay vaccinators carry out this role. The consultation considers the extension of legislation to allow lay vaccinators to undertake this role in Northern Ireland as detailed in **Section 2.7.2.9**.

Based on the Northern Ireland, TVR trial, it is expected that, around 55% of the badger population is caught in the first year, and about half of those are caught again the following year (Menzies et al., 2021). However, expert opinion indicates that approximately 10–13% of badgers may be "cage shy," reducing the overall efficacy of this approach (Smith and Cheeseman, 2007).

Badger Welfare

Welfare considerations for the use of cages for trapping are described in **Section 2.7.2.4.2.**

Vaccination leaves a stable badger population as no animals are removed. However infected animals capable of transmitting infection remain in the population.

2.7.2.6.2 Vaccination Only using stopped restraints

This vaccination only method involves using stopped body restraints to trap badgers within an identified intervention area. Following a completed georeferenced sett survey, stopped body restraint trapping would commence within the identified intervention area. This method is designed to be implemented by private operators. All restraints are inspected every morning after daybreak, to ensure the prompt handling of any captured animals.

Unlike cage-based approaches, stopped body restraints do not require pre-baiting, as the animal is unaware of the device prior to capture. The restraint incorporates a self-locking mechanism that prevents overtightening once activated, and the swivel and anchor system enables some movement while the animal remains restrained.

However, stopped body restraints are not as effective for trapping smaller, younger badgers. This limitation arises from the fixed minimum size of the restraint, designed to prevent overtightening on adult badgers. Therefore, as younger badgers often do not reach the necessary size and weight to be captured by this method

until at least late September this method may be supplemented by cage trapping in the earlier part of the intervention period, or future consideration given to extending the intervention window.

The absence of a pre-baiting requirement enables stopped body restraints to be deployed swiftly and efficiently in the field when compared with cage-trapping approaches. Stopped body restraints as a capture method has been widely implemented throughout the Republic of Ireland, where it has been carried out by a private company resulting in substantial operational experience with this method. During the five-year intervention every badger caught is vaccinated and marked. This is done without anaesthetic. No testing takes place. Mean trappability was estimated to be 34–35% per session (annual capture rate: 56–58%; across the population) (Byrne et al., 2012).

At present only a veterinarian can vaccinate a badger in Northern Ireland, whereas in England and Wales trained lay vaccinators carry out this role. The consultation considers the extension of legislation to allow lay vaccinators to undertake this role in Northern Ireland as detailed in **Section 2.7.2.9.**

Badger Welfare

Welfare considerations for the use of stopped restraints for trapping are described in **Section 2.7.2.4.3**.

Vaccination leaves a stable badger population as no animals are removed. However, infected animals capable of transmitting infection remain in the population.

2.7.2.7 Monitoring of Potential Wildlife Intervention Options

DAERA state that there would be a programme of monitoring for the deployment of any Wildlife Intervention options. This would include the following:

- Oversight of the operational activity to ensure compliance with the agreed protocol;
- Welfare, licensing and regulatory requirements; and
- Collection and review of relevant data to assess implementation.

The monitoring process would combine field information, surveillance and epidemiological data, and reporting from delivery partners, as appropriate. This monitoring programme and associated findings would be used to inform the ongoing management of intervention, contribute to review, and support the evaluation of progress within the bTB eradication strategy.

2.7.2.8 Funding and Delivery Approaches for Wildlife Intervention

DAERA has undertaken an option analysis to determine the potential funding mechanisms and delivery models which would be used to deliver the potential Wildlife Intervention Options. DAERA has examined the operational practices used within other jurisdictions and assessed the applicability of these within Northern Ireland.

Public sector delivery has not been assessed as an option for funding or delivery, as evidence from other jurisdictions has indicated that this approach involves significantly higher costs, overheads and is not currently supported by available budgets within DAERA. Furthermore, the deployment of the potential Wildlife Intervention options on a seasonal basis is typically less suitable for public sector employment. Under the following two options presented, DAERA's role will be limited to regulation, authorisation, monitoring and standard administrative functions.

DAERA considers two financially feasible approaches:

1. Delivery through private sector/industry-led commercial providers operating under authorisation, monitoring and oversight by DAERA; and
2. Delivery through farmer-led not for profit companies operating under authorisation, monitoring and oversight by DAERA.

These two options reflect international precedent, offering varying degrees of flexibility and cost-effectiveness and represent practical alternatives to public sector deployment.

2.7.2.8.1 Delivery through private sector/industry-led commercial providers

Under this delivery model, DAERA would identify the intervention areas and would then procure private companies to undertake the operational aspects of the wildlife intervention. The private company would be required to carry out the delivery of intervention in accordance with protocols and standards. DAERA would maintain an oversight role throughout the intervention to ensure it is carried out effectively and in line with regulatory requirements, including through quality assurance, monitoring performance and ensuring best practice. This model is similar to the approach used in the Republic of Ireland, however, industry would be expected to fund delivery costs should this approach be taken in Northern Ireland.

2.7.2.8.2 Delivery through farmer-led not for profit companies

Under this delivery model, DAERA would identify the intervention areas, following which farmer-led, not for profit companies would undertake the operational aspects of wildlife intervention.

The farmer, if qualified, could carry out operations themselves, or source suitably qualified labour for the tasks involved. Companies would be required to provide evidence that they have sufficient funds secured to deliver the full period of the intervention and that they have access agreements from landowners in the intervention area. Operatives would be required to demonstrate competence in the field operations detailed in the badger intervention method approval. DAERA would maintain an oversight role throughout the intervention to ensure it is carried out effectively and in line with regulatory requirements, including through quality assurance, monitoring performance and ensuring best practice. This model is similar to the approach undertaken in England with farmer-led companies delivering the cull under licence. DAERA consider that, as a highly flexible and cost effective model that can be scaled up to address bTB hotspots, it also allows farmers to become directly involved if their local area is identified for intervention.

DAERA's option analysis has costed for controlled shooting of free roaming badgers, it may be suitable for other non-selective culling options but the information to cost this accurately is not available.

2.7.2.9 Lay Vaccinators

Vaccinating badgers is one of the potential tools available to help reduce the spread of bTB. Vaccination may be deployed in three potential settings:

1. Intervention vaccination (i.e. as the wildlife intervention approach taken forward).
2. Post-intervention vaccination (e.g. as part of any transition phase following an initial 5-year wildlife intervention option such as non-selective culling or TVR).
3. Preventive vaccination in areas not currently implicated in wildlife-associated bTB spread, to reduce the risk of establishment and onward transmission to cattle.

Effective and safe delivery of badger vaccination requires enough trained personnel. As veterinarians alone may not provide the capacity needed to take forward a badger vaccination intervention, DAERA is seeking views on permitting trained, licensed lay vaccinators—individuals who are not vets, but who have completed approved training—to administer badger vaccination under strict conditions and with veterinary oversight.

At present, badger vaccination in Northern Ireland must be carried out by a veterinarian as it is considered an act of veterinary surgery under the Veterinary Surgeons Act 1966. In England and Wales an exemption exists, which allows non-vets to vaccinate animals under certain conditions. The expected benefits of enabling the training and licensing for lay vaccinators are to:

- Increase capacity and responsiveness, allowing larger or more continuous vaccination coverage.
- Improve operational efficiency and cost-effectiveness.
- Support preventive vaccination where appropriate.
- Embed welfare compliant, non-lethal wildlife management practices.

In Great Britain, the use of trained lay vaccinators forms an established component of badger vaccination delivery and is supported by a clear statutory and licensing framework. Under The Veterinary Surgery (Vaccination of Badgers against Tuberculosis) Order 2010, lay persons who have completed an approved training course and hold a valid certificate of competence may administer the BCG vaccine to wild badgers by

intramuscular injection, provided they act under the direction of a veterinary surgeon. This model enables vaccination programmes to be delivered at greater scale, expanding operational capacity while maintaining veterinary oversight. Directing veterinary surgeons remain responsible for prescribing the vaccine and ensuring appropriate supervision arrangements, including being available—or delegating availability to an attending vet—for any emergency situations. All individuals, including veterinary surgeons and lay vaccinators, must additionally hold the relevant licences to cage-trap and mark badgers for vaccination.

DAERA is proposing an amendment to Surgery (Vaccination of Badgers Against Tuberculosis) Order 2010 which would extend its operation to Northern Ireland. This would allow the establishment of a Northern Ireland licensing scheme that permits trained lay vaccinators to trap and vaccinate badgers using an authorised BCG vaccine under veterinary prescription and clinical direction, subject to compliance with:

- Competency/training accreditation
- Animal welfare and wildlife protection law
- Biosecurity and health & safety
- Data recording, reporting and monitoring

Extending this Order would ensure that Northern Ireland has a clear, lawful basis for authorising lay vaccination aligned with established Great Britain regulatory standards. Amending this Statutory instrument would be facilitated by DEFRA as it progresses through a UK parliamentary process.

3 Baseline and Environmental Issues

In line with the SEA Directive, an environmental baseline has been compiled for the SEA Environmental Report of the Plan. This includes: a description of the state of the environment at present; a discussion of the key problems/issues currently being faced in the area; and a description of the expected evolution of the environment should the Plan not be implemented, i.e., in the absence of the plan.

The baseline description focuses in the first instance on Northern Ireland, however, given the shared land boundary with the Republic of Ireland, there is potential for environmental impacts on biodiversity and material assets in the Republic of Ireland. As such, the baseline description also includes reference, where relevant, to conditions in the Republic of Ireland. Consideration has also been given to baseline information and recommendations made by consultees in response to the SEA Scoping Report.

3.1 Current State of the Environment in Northern Ireland

This section provides a general overview for Northern Ireland. This is based on the From Evidence to Opportunity, A Second Assessment of the State of Northern Ireland's Environment (NIEA, 2013)[1], updating this, where possible, by taking into account the most recent Northern Ireland Environmental Statistics Report (DAERA, 2024)[2]. Further relevant and up to date information has been used to inform the baseline for SEA topic areas described in **Section 3.2**.

Northern Ireland's most recent full state of the environment review (NIEA, 2013) found the situation to be variable. Air quality shows continuing improvement, while water quality has benefitted significantly from improved control of effluents, and rates of municipal waste recycling have been steadily increasing. Significant challenges remain, however, in reversing biodiversity declines and meeting EU objectives for water bodies, landscapes, habitats and heritage.

The main threats of climate change, land use, and socio-economic growth, continued to create pressures on the environment in Northern Ireland. These key challenges identified in the state of the environment review (NIEA, 2013) are outlined below, and their relevance to the Plan are described below in Table 3-1:

- Economic downturn –

The most significant change since 2008 identified in the 2013 review with regards to socio-economic growth was the economic downturn, which had impacts on housing, development, energy and resource use and on waste production. This intensified the need to stimulate growth and to use our resources, such as agricultural lands more efficiently whilst protecting and enhancing the natural environment.

- Living within our limits –

Living within our limits relates to the impact of ever-increasing populations on the environment in terms of food production, imports, energy use, and water security. The 2013 review reported an increasing realisation that living within our limits, both economically and environmentally, locally and globally, is now a major challenge.

- Sustainable rural land use –

The 2013 review identified that the marine environment, from biodiversity indicators and the status of our waters are under threat. The 2013 review noted the relationship between rural land practices and the water environment and identified that a fully integrated approach to management of the land and water environment was needed.

- Climate change –

The 2013 review identified that climate change remains an important issue for Northern Ireland and indeed globally. However, recent legislation such as the UK Climate Change Act along with renewable energy policies and increasing energy costs are likely to contribute to already positive advancements.

[1] From Evidence to Opportunity, A Second Assessment of the State of Northern Ireland's Environment
[2] Northern Ireland Environmental Statistics Report 2024

Table 3-1: State of the Environment Key Challenges and Relevance to the Plan

Challenge	Relationship to the Plan
Economic downturn	The agri-food sector includes agriculture, horticulture and food and drinks processing and is Northern Ireland's largest indigenous industry. The economic downturn in 2008 has intensified the need to stimulate growth and to use our resources, such as agricultural lands, more efficiently. As a result, the agri-food sector has continued to report increases in output during the economic downturn and has emerged as a sector with substantial potential for growth, as set out in the Executive Programme for Government 2011-2015. However, managing this growth in a sustainable way continues to be a key challenge for the environment. Improved efficiencies in the agri-food sector adds increasing pressure to the environment from GHG (greenhouse gas) emissions, loss of natural habitats, the use of pesticides and increased emissions of nutrients into the surrounding environment. The proposed measures of the Plan have potential to influence these factors regarding the cattle industry.
Living within our limits	Ever increasing populations and demand for resources such as land, energy and food are putting pressure on the environment in a global context. The most recent 7th EU Environmental Action Programme 'Living well, within the limits of our planet' sets out the framework for environmental policy making in the EU. This highlights the realisation that the environment has limits, and that in order to manage and maintain ecosystem services and natural capital, there needs to be greater resource efficiency. Agricultural production efficiencies in Northern Ireland must continue to be made but in a sustainable way, with regard to finite resources and to more sustainable emissions. The proposed measures of the Plan aim to make improvements in the production of cattle by avoiding the destruction of bTB positive animals early within their lifecycle stage, which represents an inefficient use of resources and a loss of productivity.
Sustainable rural land use	Increasing agricultural targets across Northern Ireland has potential to impact on rural landscapes, as changing agricultural practices put increasing pressure on soils through increased risk of erosion, accumulation or leaching of nutrients and changing levels of soil organic matter. Unsustainable rural land practices can also result in negative impacts to the water environment. The proposed measures of the Plan aim to better improve cattle management with respect to biosecurity which may benefit land use through clearer habitat delineation between agricultural and wildlife areas and minimise water quality pollution events to reduce contamination risks and spread of bTB between species.
Climate change	Climate change and greenhouse GHG remain an important global issue. Agricultural practices release large quantities of GHGs. In Northern Ireland, although GHG emissions have been decreasing in the period from 1990-2011, intensification of agricultural practices and changes in land use could see increases in emissions if not managed in a sustainable manner. Indeed, climate change is a global issue, and records since the start of the 20th century show that the climate of Northern Ireland is changing. Preparing and adapting to the effects of climate change is therefore a key priority for Northern Ireland. The proposed measures of the Plan aim to reduce the incidences of bTB to reduce the need to destroy infected livestock, aiding in the reduction of inefficient resource production and associated GHG emissions.

Following on from the key challenges identified, three key principles underpinning the way forward were also listed in the state of the environment review (NIEA, 2013), and comprise the following:

- Working to achieve **resilient, diverse ecosystems** capable of providing vital services while absorbing pressures and responding to change;
- Valuing and **managing natural resources** to support economic and social prosperity; and
- Protecting the quality of life by **reducing pollution, protecting heritage** and promoting **sustainable land use**.

A summary of the relevant aspects of the current state of the environment in Northern Ireland, as presented in the most recent state of the environment review (NIEA, 2013) and updated, where possible, by taking into account the most recent Northern Ireland Environmental Statistics Report (NISRA, 2025a), has been provided in **Table 3-2**.

Table 3-2: Summary of Current State of the Environment in Northern Ireland (NIEA, 2013), of relevance to the Plan

Theme	Key Findings
Air Quality	There are 23 air quality monitoring stations in Northern Ireland. Air quality in Northern Ireland has shown substantial improvement in recent years. The average annual mean concentration of NO_2 across Northern Ireland's urban background sites remained relatively stable between 2011 and 2016, varying between 20 and 23 µg/m^3. However, since 2017 the average annual mean concentration of NO_2 has fallen below this level and was 11.3 µg/m^3 across Northern Ireland's urban background sites in 2024. In 2022, there was no breach of the UK Strategy Objective or the Air Quality Standards Regulations Limit Values of 40 µg/m^3 for the annual mean concentration of particle matter (PM_{10}). The annual mean PM_{10} concentration across Northern Ireland's urban monitoring sites reached a maximum of 22 µg/m^3 (in 2010) but has shown a gradual decline since that time, with an annual mean value of 13 µg/m^3 in 2024. The agriculture sector accounted for the majority of ammonia emissions in Northern Ireland in 2021. Other sources included transport, commercial and domestic combustion and industrial processes. Overall, ammonia emissions have increased, by 7.3%, from 28.8 kt in 2005 to 30.9 kt in 2022. Continued effort is required to reduce air pollution from key sources such as road transport and agriculture.
Climate	In 2022, Northern Ireland's greenhouse gas (GHG) emissions were estimated to be 21.3 $MtCO_2e$, a reduction of 26% since baseline levels in 1990. Agriculture (29%), transport (18%), and buildings and product uses (15%) were the largest contributing sectors to GHG emissions in Northern Ireland in 2020. The UK Climate Change Act commits the UK to reducing emissions by 100% by 2050 from 1990 baseline levels. The same 100% emission reduction target is now true of Northern Ireland, due to the Climate Change Act NI, as of June 2022. In 2022, Northern Ireland's total GHG emissions accounted for 5% of the UK total, higher than its population share of 3%. For the period January to December 2024, 44% of the total electricity consumption in Northern Ireland was generated from renewable sources based in Northern Ireland. Climate change and GHG emissions remain an important global issue. In Northern Ireland, although GHG emissions have been decreasing in the period from 1990-2011, intensification of agricultural practices and changes in land use could see increases in emissions, if not managed in a sustainable manner. Indeed, climate change is a global issue, and records since the start of the 20th century show that the climate of Northern Ireland is changing. Preparing and adapting to the effects of climate change is therefore a key priority for Northern Ireland.
Water	Eutrophication, or the enrichment of water by nutrients, especially compounds of nitrogen and/or phosphorus is recognised in the State of the Environment Report 2013 as a widespread major threat to water quality in the freshwater environment. The report stated that the overall status of water bodies in Northern Ireland had not significantly changed from that recorded in 2012, but improvements had been identified in water utility discharges and drinking water quality. Long-term seasonal trend analysis reported in the State of the Environment Report 2013 showed that the

Theme	Key Findings
	monthly trends in average nitrate concentrations in rivers in Northern Ireland were predominantly decreasing or stable over the 28-year period, 1992-2019, which may be attributed to the measures implemented through the Nitrates Action Programme. However, DAERA issued a consultation document on Significant Water Management Issues (DAERA, 2019a) to inform the development of the third cycle River Basin Management Plan (2021-2027) (RBMP). This showed that the most significant pressure on water quality in Northern Ireland is from the release of the nutrients not only nitrogen but also from phosphorus, from agricultural and other sources. Between 2015 and 2018, Soluble Reactive Phosphorus (SRP) was the cause of decline in status for 100 river water bodies across Northern Ireland. It should also be noted that The Programme for Government (PfG) Outcome 2 indicator includes SRP concentrations in rivers. In 2024, there were 1,886 water incidents reported to NIEA or discovered by NIEA during inspections. Of these incidents, 47% were confirmed as having an impact on the water quality of the receiving waterway, with 119 of these incidents of these considered as high or medium severity.
Marine	The majority of Northern Ireland's 650 km of coastline is protected for its special interest, and several of Northern Ireland's coastal species and habitats are recognised as internationally important. Of the 25 inshore coastal waterbodies in Northern Ireland, 13 were reported as good or better ecological condition (NISRA, 2025a). High nutrient levels, particularly in inshore estuarine waters and sea loughs, are identified as a key element responsible for coastal water bodies not attaining good ecological condition. In January 2014, the Shellfish Waters Directive was subsumed into the Water Framework Directive, resulting in more stringent *E. coli* standards. Four out of nine (44%) designated shellfish water protected areas (SWPAs) complied with the Water Framework Directive Guideline *E. Coli* standard in Shellfish Flesh in 2024.
Land and Landscape	Agri-environment schemes encourage farmers and landowners to manage their land to benefit the environment. At the end of 2024, 59,000 hectares of land in Northern Ireland were under an agri-environment scheme agreement. In Northern Ireland, over 52% of forests and woodlands are state-owned or managed. The NI Environmental Statistics Report 2025, reported that in 2024/25, 502 hectares of new woodland were planted by NI Forest Service and private landowners supported by grant aid.
Biodiversity	The Northern Ireland Environmental Statistics Report 2025 reported that in 2024/25, 54% of features within marine and terrestrial protected sites were in Favourable condition, whilst 38% were in Unfavourable condition. Approximately 2% were in Unfavourable-Recovering condition with less than 1% Destroyed. The wild bird population indicator using 56 bird species showed slightly increased levels in 2023 compared to 1996. Bird populations peaked in 2005 and have been in decline since, driven principally by bird species found in farmland habitats.
Built Heritage	The key risks identified to archaeological resources come from agricultural land use and urban activities. In 2023/24, there were a total of 2,053 scheduled historic monuments protected under Article 3 of the Historic Monuments and Archaeological Objects (NI) Order 1995. Overall, there has been a 36% increase in the number of scheduled monuments since 2001/02, reflecting ongoing survey, designation and assessment. In addition, there has been a modest increase in the number of buildings listed in recent years with a total of 9,124 statutory listings in 2023/24, compared with 8,191 in 2003/04. The figures provide an indication of this aspect of the rich cultural and built heritage of Northern Ireland, an increasingly important source of "soft power" and an important contributor to the Northern Ireland economy, through attracting tourism and filming. In 2023/24, 1,111 historic buildings and structures were recorded on the Heritage At Risk Register NI (HARNI) register as 'at risk'.

Theme	Key Findings
Waste and Resources	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. The Northern Ireland Environmental Statistics Report 2025 notes that The Local Authority Municipal Waste Management Statistics show that the amount of waste sent for energy recovery via incineration has grown exponentially since 2006-07, whilst the proportion of waste sent to landfill has more than halved in the same timescale. Recycling of waste is becoming much more common in Northern Ireland. The revised Northern Ireland Waste Management Strategy (DAERA, 2013a) proposed to achieve a 50% recycling rate by 2020 for local authority collected municipal waste. For municipal waste in 2023/2024 the recycling rate was 51.5%, similar to the rate in 2022/2023. The recycling rate for all household waste was 50.5% in 2021/22, which was an increase compared to the 2021/22 rate of 49.7%.

3.2 Environmental Characteristics

This section describes the environmental baseline for Northern Ireland, of relevance to the Plan. The baseline has been divided by topic into the issues requiring assessment under SEA legislation. The purpose of this section is to demonstrate the level of baseline environmental information used when assessing the potential impacts of implementing the Plan. This baseline information forms the indicators which the measures of the Plan will have the potential to impact upon. Future variation in these indicators owing to implementation of the will be monitored as part of the SEA review.

3.2.1 Biodiversity, Flora & Fauna

Biodiversity is the variety of all plants and animals, and the communities that they form. The conservation of biodiversity is important in its own right. Humans are also dependent on biodiversity for the provision of ecosystem services such as clean air and water, food and shelter, as well as for the health and amenity value that the natural environment can provide.

The importance of preserving biodiversity has increasingly been recognised from an international to a local level, and Northern Ireland has legal obligations under International and EU commitments and legislation. The UN Convention on Biological Diversity (1992) is an international legally binding treaty with three main goals: conservation of biodiversity; sustainable use of biodiversity; and the fair and equitable sharing of the benefits arising from the use of genetic resources. It requires the development of national strategies for the conservation and sustainable use of biological diversity. The most recent Biodiversity Strategy for Northern Ireland, “Valuing Nature”, was published by DAERA in 2015 and covered the period up to 2020. This set out how Northern Ireland planned to meet its international obligations and local targets to protect biodiversity, and to ensure that the environment can continue to support the population and economy of Northern Ireland. Its overall mission was “To make progress towards halting overall biodiversity loss, establish an ecosystem approach and help business and society in general have a greater understanding of the benefits that nature can bring to everyday life in Northern Ireland”. Following the UN Biodiversity Conference in December 2022 (COP15), a Global Biodiversity Framework (GBF) was agreed that aims to see 30% of land protected globally by 2030, and Northern Ireland’s commitment to protect 30% of land and sea for nature by 2030 was confirmed by the Environmental Improvement Plan, published in 2024. A new Nature Recovery (Biodiversity) Strategy for Northern Ireland is currently in production, that will reflect the targets set out by the GBF.

The Plan must have regard for the Habitats Directive and the Birds Directive, as transposed through the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995, which require that any plan or project not directly connected with or necessary to the management of a European site but likely to have a significant effect on such a site, must undergo an appropriate assessment in view of best scientific knowledge and in view of the conservation objectives of the site. The potential Wildlife Intervention Options of the Plan fall under this remit, and HRA is being undertaken in parallel to the SEA process, to assess the potential implications of the Plan for European Sites.

It is considered that the key issues associated with implementation of the Plan and the potential Wildlife Intervention Options and Biodiversity, Flora and Fauna comprise:

- Potential for effects on protected areas, including those of international (SACs, SPAs, Ramsar Sites), national (ASSIs, NNRs) and local (SLNCI) importance;
- Potential for effects on protected and priority habitats and species;
- Potential for regionalised direct negative impacts on badger populations within intervention areas from culling activities as a protected species;
- Potential for disturbance or displacement effects on species; and
- Potential for indirect effects on water-dependent habitats and species (including effects on freshwater pearl mussel, salmonids and other protected fish and shellfish species).

3.2.1.1 Designated Sites

3.2.1.1.1 Overview of Designated Sites

Sites have been designated to provide protection to those habitats and species considered to be of a particular conservation value. These include features whose conservation is of importance at a European level, for which 58 Special Areas of Conservation (SACs), 16 Special Protection Areas (SPAs) and two additional proposed Special Protection Areas (pSPAs) of Carlingford Marine and East Coast Marine, and 20 Ramsar Sites have been designated, to date. SPAs and SACs are designated under the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended). Northern Ireland has 49 habitats listed in Annex I of the Habitats Directive, of which 13 are priority habitats at a European level, and 18 species listed in Annex II of the Directive (DAERA, 2013b).

At a national level, 394 Areas of Special Scientific Interest (ASSIs) and 50 statutory Nature Reserves have been designated to provide protection to features considered to be of national importance, while 1823 Local Wildlife Sites have been identified by DAERA for priority habitats, many of which are also protected for their importance at a more local level, known as Sites of Local Nature Conservation Importance (SLNCIs). These designated/protected sites in Northern Ireland are detailed in **Table 3-3** and their locations shown in **Figure 3-1**. In addition, there are 10 sites in Northern Ireland protected as RSPB (Royal Society for the Protection of Birds) nature reserves, and 18 sites protected as Ulster Wildlife nature reserves. There is over 110km^2 of ancient woodland (land continuously wooded since at least 1600) within Northern Ireland. There are also five Marine Conservation Zones (MCZs) designated under the Marine Act (Northern Ireland) 2013 to safeguard vulnerable or unique marine species and habitats of national importance in the inshore region of Northern Ireland.

Sites have also been designated for nature conservation within the Republic of Ireland. Some sites within the Republic of Ireland extend into Northern Ireland, and others are in close proximity; there may therefore be potential for transboundary effects on these sites from implementation of the Plan and the potential Wildlife Intervention Options. There are 30 SACs, 12 SPAs, 13 Natural Heritage Areas (NHAs) and 100 proposed Natural Heritage Areas (pNHAs) in the Republic of Ireland within 15km of the boundary with Northern Ireland, as shown in **Figure 3-1**.

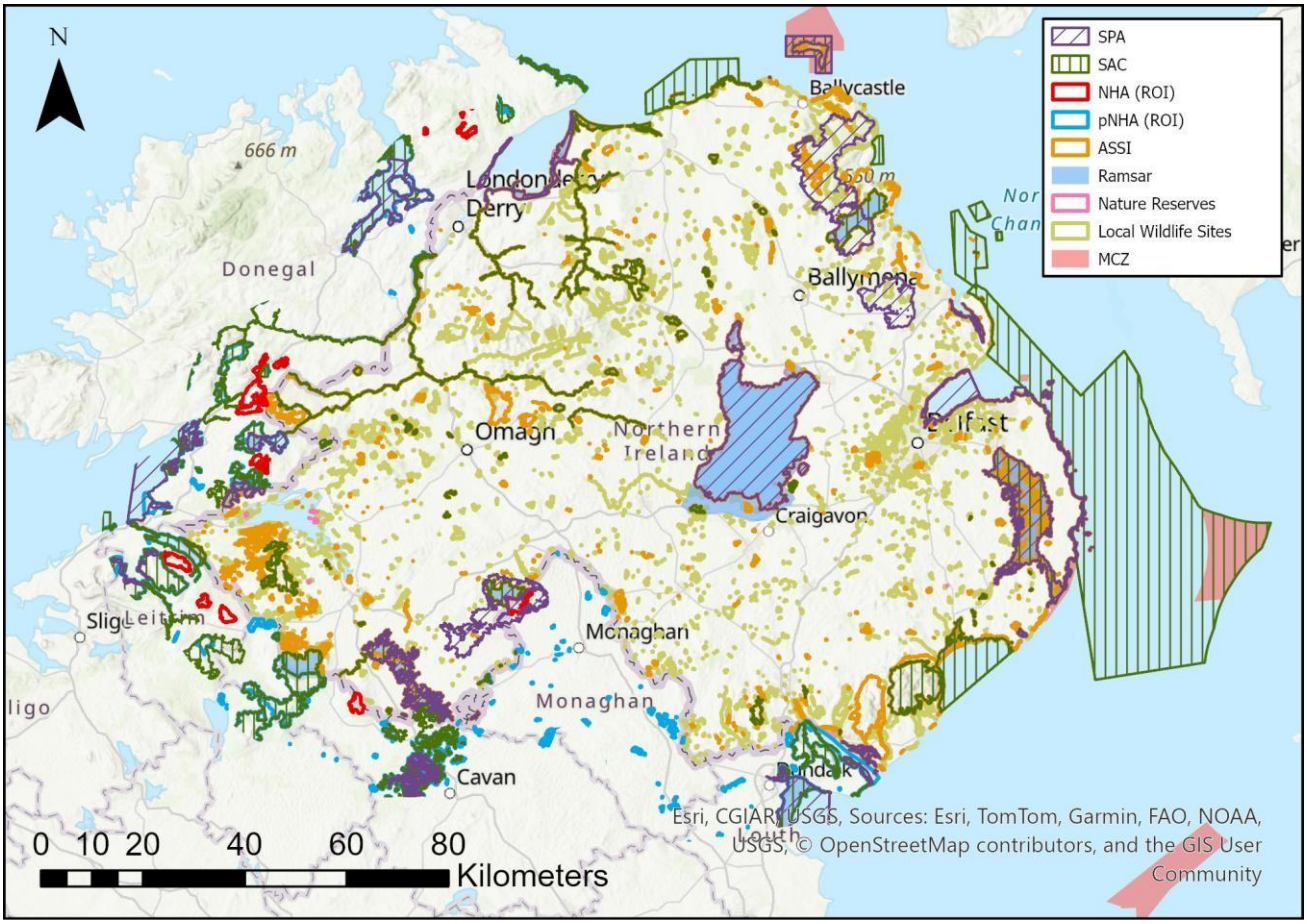

Figure 3-1: Designated sites across Northern Ireland and the border regions with the Republic of Ireland

Table 3-3: Number and type of sites designated for conservation of Biodiversity, Flora and Fauna in Northern Ireland

Site Designation	Description	Number
Special Areas of Conservation (SACs)	Existing SACs in Northern Ireland were designated in accordance with the Habitats Directive (92/43/EEC) for the conservation of certain habitats and species while SPAs were designated under the EU Directive on the Conservation of Wild Birds (EC/79/409), “The Birds Directive”, as areas that are important for breeding, feeding, wintering or migration of rare and vulnerable bird species. Together these formed part of the Natura 2000 network of protected sites. Following the UK’s exit from the EU, there is now a UK National Site Network of European sites, comprising existing designated sites and any further sites designated under the Habitats Regulations. SACs and SPAs in the Republic of Ireland remain part of the Natura 2000 site network. There are two proposed SPAs (pSPAs) of Carlingford Marine and East Coast Marine.	58
Special Protection Areas (SPAs)		16
Ramsar Sites	Ramsar sites are designated under the “Ramsar Convention” (Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat, Iran 1971), an international treaty for the conservation and sustainable use of wetlands.	20

Site Designation	Description	Number
Areas of Special Scientific Interest (ASSIs)	Areas of Special Scientific Interest (ASSI) are protected under the Environment (Northern Ireland) Order 2002. This requires NIEA to designate land as an ASSI that it considers to be of special scientific interest, owing to the flora or fauna present, or the presence of geological features.	394
Natural Heritage Areas (NHAs)	Sites designated in the Republic of Ireland under the Wildlife (Amendment) Act 2000. An equivalent national designation to ASSIs in Northern Ireland.	171
Proposed Natural Heritage Areas (pNHAs)	Proposed Natural Heritage Areas (pNHAs) were published on a non-statutory basis in 1995 but have not been designated or statutorily proposed. These sites are of significant for wildlife and habitats in the Republic of Ireland.	1,180
National Nature Reserves	Statutory Nature Reserves are areas of importance for flora, fauna, geological or other special features for conservation purposes and to provide the opportunity for research. They are designated under the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985.	50
Sites of Local Nature Conservation Importance (SLNCIs)	Each council area in Northern Ireland reports on locally important sensitive or valued habitats through the production of Local Biodiversity Action Plans (LBAPs). These Plans outline the areas of importance for natural heritage reasons within the council area, guiding development policy and potential enhancement of local biodiversity. These are known as SLNCIs.	Many of the 1,823 Local Wildlife Sites identified by DAERA are provided protection as SLNCIs
Marine Conservation Zones (MCZs)	Marine Conservation Zones (MCZs) protect nationally important marine species, habitats and features of geological or geomorphological interest. Priority Marine Features (PMF) is a collective term for the features considered to be of conservation importance in the Northern Ireland inshore region and form the basis of MCZ designation under the Marine Act (NI) 2013 and offshore regions, respectively. These sites should complement the marine components of sites designated under the Birds and Habitats Directives, coastal ASSIs and Ramsar sites, together forming a network of Marine Protected Areas (MPAs).	5

3.2.1.1.2 Status and Trends for Sites important at an International Level (SACs and SPAs)

Article 17 of the Habitats Directive requires that, every six years, all EU Member States report on the implementation of the Directive, including on the conservation status of habitats and species (informally known as the Article 17 report). The 4th UK Habitats Directive Report was submitted to the European Commission in August 2019, and included a General Implementation Report, Habitat Reports and Species Reports. These outlined any changes in designated habitats and species, for the UK as a whole, in the period 2013-2018 (JNCC, 2019a). Only six habitats were given an overall conservation status of 'Favourable', with eight habitats classified

as ‘Inadequate’, 62 as ‘Bad’ and one classified as ‘Unknown’ conservation status. Of these, 22 habitats showed improvement in overall conservation status, 29 habitats showed no change, 22 habitats showed a decline, and 4 were uncertain in comparison with the results of the 3rd UK Habitats Directive Report.

Of the designated species reported, 33 were given an overall conservation status of ‘Favourable’, 24 a status of ‘Inadequate’, 16 a status of ‘Bad’ and 20 a status of ‘Unknown’. Of these, 9 species showed improvement in overall conservation status, 47 showed no change, 12 showed decline and 25 were uncertain in comparison with the results of the 3rd UK Habitats Directive Report.

Article 12 of the Birds Directive requires that, every six years, all EU Member States report on the implementation of the Directive. The 11th UK Report for Article 12 of the EU Birds Directive was submitted to the European Commission in October 2019. The report format includes both a General Report on the implementation of the Directive (Annex A), and a Bird Species Status and Trends Report containing individual assessments for all relevant bird species (Annex B). Of the 319 birds included in this assessment (including in some cases both breeding and wintering populations separately), 131 showed a short-term decreasing population trend, while 108 showed a long-term decreasing population trend.

Following the UK’s exit from the EU, reporting to the European Commission will no longer be required, however DAERA will report periodically every 6 years following exit from the EU. The first of these reports is due in 2026.

3.2.1.1.3 Status and Trends for Sites important at a National Level

Northern Ireland launched its first State of the Environment Report in 2008, containing 30 indicators that were designed to assist future comparison and measurement of the changing environment. The last full State of the Environment Report for Northern Ireland was published in 2013 and, in the interim period, the NIEA has published annually a Northern Ireland Environmental Statistics Report, providing annual reports on a range of environmental indicators. The most recent report is for 2025 (NISRA, 2025a), providing key information regarding the current status of biodiversity indicators in Northern Ireland.

Since 2022, a combined feature condition standard for all network features on land and sea in Northern Ireland was produced. This is a new metric collated for the country which helps align with UK reporting and JNCC Common Standards Monitoring condition categories, which are as follows:

- Favourable: Condition objectives are being met.
- Unfavourable: Condition objectives are not being met.
- Partially destroyed: The feature, habitat or processes essential to support it have been removed or irretrievably altered. A condition assessment should be carried out on the remaining, intact feature.
- Destroyed: The feature, its supporting habitat or processes have been affected (completely or partially) to such an extent that there is no hope of recovery.

Further sub-categories can be used to detail pressures on the feature contributing to a continued decline or where trends indicate that a feature is recovering.

The 2025 report indicated that:

- 54% of all features, both terrestrial and marine, were in a Favourable condition.
- 38% of all features were in an Unfavourable condition.
- 2% of all features were in an Unfavourable Recovering condition.
- Less than 1% of all features were destroyed.
- 4% of all features had an undetermined condition due to a lack of formal assessment.

When this is partitioned into habitats, species and earth science features assessed, 35% of habitats and 58% of species features were in Favourable condition, compared to 93% of earth science features in Favourable condition, reflecting the greater pressures on the natural environment and relative stability of geological features.

This indicates a slight (1%) decrease in features in favourable condition and increase (2%) in features in unfavourable condition since the 2023/24 reporting period, with a decrease (3%) of habitats in favourable condition. The reporting indicates variation in the condition assessment across habitat and species categories and further details the proportion in favourable condition within categories, as shown in **Table 3-4**.

Table 3-4: Condition of features within Terrestrial and Marine Protected Sites by type of feature, year ended March 2025 (DAERA, 2025)

Feature Type	Number of Features	Number of Features in Favourable Condition	Proportion Favourable (%)
Habitats			
Bogs	53	7	13%
Coastal	52	20	38%
Fen, marsh & swamp	89	26	29%
Freshwater	58	17	29%
Grasslands	103	63	61%
Heathlands	42	4	10%
Inland rock	16	11	69%
Marine	46	40	87%
Woodlands	80	2	3%
Habitats Total	**539**	**190**	**35%**
Species			
Birds	369	231	63%
Fish	9	4	44%
Fungi	14	8	57%
Invertebrates	156	76	49%
Marine mammals	7	4	57%
Non-vascular plants	35	19	54%

Feature Type	Number of Features	Number of Features in Favourable Condition	Proportion Favourable (%)
Terrestrial mammals	11	9	82%
Vascular plants	70	37	53%
Species Total	**671**	**388**	**58%**

The Environmental Statistics Report 2025 states that, in 2024/2025, the area of terrestrial protected sites under management in NI was recorded as at least 25,710 hectares. The area of marine protected sites under management in 2024/2025 was recorded as 38% of NI waters.

3.2.1.2 Protected and Priority Habitats and Species

Certain habitats and species have a higher sensitivity to disturbance. These impacts may include habitat degradation, fragmentation, or loss, disturbance or displacement, or the introduction of invasive non-native species.

3.2.1.2.1 Legislative Protection of Wild Fauna and Flora

Certain species of animals and plants are provided legal protection in Northern Ireland by the Wildlife (Northern Ireland) Order 1985 with the amendment of The Wildlife (Amendment) (Northern Ireland) Order 1995 ,and amendment the Wildlife and Natural Environment Act (Northern Ireland) 2011. This includes all nesting birds, certain birds listed in Schedule 1 such as buzzards and corncrakes, certain animals listed in Schedule 5 such as pine martin and badger, and certain plants listed in Scheule 8 such as Moss Campion and Water Crowfoot. The intentional destruction, uprooting or picking of certain wild plants is also prohibited. The Order also lists certain species that are considered invasive in Schedule 9, making it an offence to release these species into the wild. The Wildlife and Natural Environment Act (Northern Ireland) 2011 provided additional protective measures and also introduced a statutory duty on all public bodies to further the conservation of biodiversity.

3.2.1.2.2 Priority Habitats and Species in Northern Ireland

There are a wide variety of natural habitats and species within Northern Ireland. DAERA has compiled a list of those habitats and species considered to be priority, based on their listing as a UK Priority Habitat (DAERA, 2015) / Species (DAERA, 2023) or importance in an all-Ireland context, and current downward trends; the most recent lists comprise 51 Northern Ireland Priority Habitats, and 594 species. Priority Habitats include upland flushes, fens and swamps, hedgerows, lowland raised bog and rivers, while Priority Species include birds, algae, vascular plants, invertebrates, fish, sponges, reptiles and mammals.

3.2.1.3 Badgers

The European Badger *(Meles meles)* belongs to the Mustelidae family and is the UK's largest land predator, recognisable by their distinctive black and white striped sturdy coarse-haired bodies, ranging in size from between 75-100cm with weights ranging between 8-12kg with an average lifespan of between 5-8 years (The Wildlife Trust, 2025). Badgers have poor vision, which is monochromatic. Badgers are omnivores and will forage for food, feeding on a variety of food sources including small mammals, birds' eggs, earthworms, fruits and plants this may also include carrion. They are found in a range of habitats including grasslands, heathland and moorlands, farmland, orchard, woodland, as well as urban areas of towns and garden. However, their preferred habitat comprises coniferous, deciduous or mixed woodlands, often favouring areas adjacent to open fields.

Badgers will construct an underground den known as a sett, which is connected by a complex network of tunnels and chambers. These may contain multiple entrances (large well-established setts have been recorded to have between 50-100 entrance holes (Badgerland, 2025)), which may be excavated and accessible at different depths under the soil's surface. These setts will typically be constructed on areas of sloping ground above the

surrounding water table. Research has indicated that badger setts can be frequented by other species including rabbits, foxes, rats, voles, mice, deer and birds (O'Hagan et al., 2023). The badgers will excavate tunnels and chambers within the sett and will gather a variety of bedding materials from the surrounding landscape for use within the sett. They will also routinely remove the bedding materials from the sett to allow this to air-out before re-use. Typically, around six badgers will live together in a group known as a clan, but this may range from between two to twenty individuals.

Badgers are primarily crepuscular and nocturnal in their activities (i.e., active at twilight and at night), as their main food source of earthworms emerge at the soil surface at night to breed. In the UK, badgers will leave their setts before dusk between May and August, and after dark for the remainder of the year. They have reduced activity levels from November to February. Badger territories may range from between 30 to 150ha, the extents of which can be identified from well-worn paths and the presence of communal badger latrines within the area. The territory will often include one main sett and several smaller annex setts (Scottish Badgers, 2025).

Badgers may mate year-round, however early spring is typically the main period. The species has the reproduction phenomenon of delayed implantation whereby implantation does not occur for several months until the winter period. Badger cubs will generally be born in February/March and will remain underground, dependent on the mother until they are weaned, typically occurring by the early summer months. The cubs have a high mortality rate with around only 50% surviving their first year (Scottish Badgers, 2025).

3.2.1.3.1 Badger Protection Legislation

Badgers are subject to a number of threats, including badger baiting, disease, starvation and fighting as well as suffering frequent fatalities on UK roads and railways, with estimates of up to 50,000 badgers killed per year in the UK (Badger Trust, 2017). Whilst adult badgers have no natural predators in the UK, badger cubs may be killed and eaten by foxes or predated on by large birds of prey. Although badgers and their setts are protected by law throughout Great Britain, Northern Ireland and the Republic of Ireland, badgers remain subject to baiting, snaring, poisoning and shooting. Badgers may not be deliberately killed, persecuted or trapped except under license from the relevant government department or agency.

In Northern Ireland, badgers and their setts are protected under the Wildlife Order (Northern Ireland) 1985 (listed as a protected species under Schedule 5) as amended. Under this legislation, it is a criminal offence to harm or disturb these animals, obstruct access to their place or refuge or to destroy or damage anything which conceals or provides protection to their place of refuge. The Welfare of Animals Act (Northern Ireland) 2011 (amended by the Justice Act (Northern Ireland) 2016 to increase the maximum penalties for animal cruelty) also bans acts of cruelty against animals such as badger baiting, however it is estimated by the USPCA (2023) that over 2,000 badgers are baited and killed each year in Northern Ireland.

Within the Republic of Ireland, badgers are protected under the Wildlife Act of 1976 and the Wildlife Amendment Act of 2000, whereby it is illegal to intentionally harm or kill a badger or to deliberately damage or destroy a sett.

3.2.1.3.2 Ecological Interactions

Badgers are widespread throughout the UK and Ireland and have an important ecological role within the ecosystem for the maintenance of health and diversity. They are considered to be a keystone species within the UK and Ireland, i.e., one that may have a disproportionately large effect on the natural environment relative to their abundance.

The badger's omnivore diet, which includes predominantly earthworms, insects, small mammals, fruits and roots, aids in the regulation of invertebrates and also acts to disperse seeds via faeces and their fur. Badgers and the activities taken around setts may provide a number of ecosystem benefits and contribute to biodiversity. For example, regular soil excavations, and the creation of spoil heaps around setts that retain higher moisture levels than the surrounding environment, can provide habitats for amphibians and invertebrates and promote soil health by soil aeration; and bryophyte diversity has been recorded as being more diverse around setts due to the soil disturbance from badgers excavating out setts and surrounding areas, with over 55 species of bryophytes recorded around the general area, approximately half of which were located on the sett itself, which can in turn support a variety of invertebrates (Kurek and Cykowsha-Marzencka, 2016).

Badgers have also been observed to co-exist with other species such as foxes, volves and pine martens within setts (Mori and Menchetti, 2019), alongside incidences of raising young simultaneously. It should be noted that pine martens are protected in Northern Ireland by the Wildlife (NI) Order 1985 and amendment The Wildlife

(Amendment) (Northern Ireland) Order 1995, whereby it is an offence, except under licence to capture or kill a pine marten or to destroy or disturb its resting place (DAERA, 2019b). There is potential for wildlife intervention options to lead to the disturbance of other species in the vicinity of setts, which may lead to young abandonment if incorrectly timed, and should any activities for trapping accidentally trap non-target species where setts are being used by multiple species.

The removal of badgers from an ecosystem has the potential for impacts on other species due to alterations in ecology. It may lead to an increase in pest species such as rabbits, rats and mice due to reduced predation by badgers. It has also been evidenced that following badger culls, the number of foxes can increase as well as hedgehog numbers (TB Hub, 2020a). An increased number of foxes may in turn lead to a decrease in species numbers for other fauna, e.g., through potential for increased predation on species such as hedgehogs, hares or ground nesting bird species (Mitchell-Jones, 2020).

Perturbation effects have been observed during culling campaigns in England, where the removal of badgers from an area by culling resulted in badgers from outside of this area choosing to move into the area through extra-territorial excursions into the newly-vacated territory. This can lead to potential increases in bTB should those badgers moving into the area be infected (Allen et al., 2019). Furthermore, it has been observed that following culling, badgers which remain in the intervention areas can show increased roaming distances and potentially enter into new territories and increase the potential for opportunities for the spreading of infection (Ham et al., 2019).

3.2.1.3.3 Badger Populations and Distribution within Northern Ireland

The most recently published survey (Reid et al., 2012) for badger populations within Northern Ireland was conducted in 2007-2008, which repeated a national survey previously conducted from 1990-1993. The survey estimated that there were approximately 34,100 badgers within Northern Ireland and approximately 7,600 social groups. Furthermore, it was concluded that setts were predominantly found within areas of improved grassland and arable agricultural areas and favoured areas with cover; due to the low tree cover within Northern Ireland, setts were mainly located within hedgerows. Counties Down and Armagh, with a drumlinated farming landscape, supported the largest densities of badger populations (PAW NI, 2020). The average badger density across Northern Ireland was 2.5 animals per km^2. Within the Republic of Ireland, the most recent national survey on badger populations was undertaken in 1995 and estimated a population of 200,000 (Smal, 1995).

DAERA has undertaken previous work to identify potential badger intervention areas and research using test and vaccinate or remove (TVR) as a wildlife intervention option. From 2014 to 2018 (DAERA, 2019c), the TVR 5-year research project was carried out to increase the evidence base surrounding potential wildlife intervention options; this included determining the suitable size of an intervention area and undertaking badger sett surveys to obtain data regarding numbers and locations of setts, prior to the introduction of any measures.

3.2.1.3.4 Badgers and TB Incidences

Badgers can be infected by and carry bTB. They typically show no clinical symptoms and live unaffected (TB Hub, 2020b); however, in some cases the disease can advance and lead to emaciation and eventual death. Research has indicated that less than one in five badgers in Northern Ireland has TB (DAERA, 2024). It has long been stated that bTB spreads from badgers to cattle, with badgers acting as a reservoir for *M. bovis* (Griffin et al., 2023). *M. bovis* can be shed by infected animals from sputum, urine, faeces and wound discharge. Infection typically occurs from direct contact, however spreading can also occur indirectly from infected fluids contaminating the environment. This contamination can include pastures, feed concentrates, hay, silage, soil, faeces and water (Fine et al., 2011). Research has indicated that eradication of bTB within cattle will be difficult without addressing the reservoir of *M. bovis* infection within badgers (Ní Bhuachalla et al., 2014).

3.2.1.4 Disturbances from shooting

There is potential for culling activities to lead to the disturbance of other species within the surrounding habitat area. Given the wide distribution of habitats occupied by badgers there is potential for disturbance effects on other priority species or qualifying species of designated sites. Disturbance may lead to short-term displacement from habitats and may impact on behaviours such as feeding and reproduction, which may have long-term effects on population distributions and structure.

3.2.1.5 Water-Dependent Habitats and Species

3.2.1.5.1 Water-dependent European Sites

The Water Framework Directive (WFD) (200/60/EC), transposed in Northern Ireland through The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017, required Member States to develop a Register of Protected Areas comprising lands that have been designated as requiring special protection under specific Community legislation for protection of surface water or groundwater, or for conservation of habitats and/or species that depend upon water. These components, which had to be established for each River Basin District (RBD), are outlined in Annex IV of the WFD, and include sites that are used for water abstraction, those designated for salmonids, those designated for bathing, those designated for shellfish production, nutrient sensitive areas, and those designated "for the conservation of habitats and species directly depending on water". The Water (Amendment) (Northern Ireland) (EU Exit) Regulations 2019 ensured that the WFD (as transposed) and the various supporting pieces of water legislation continued to operate in Northern Ireland after 1 January 2021. Where a European site (SAC or SPA) lies within a water body, the WFD status objectives apply in addition to the requirement to maintain the site at favourable conservation status or restore it to that status.

There are three RBDs within Northern Ireland**,** the North Eastern (NERBD), North Western (NWRBD) and Neagh Bann (NBRBD) RBDs. For the 3rd cycle RBMP 2021-2027, a total of 27 water-dependent European sites were identified for the North Western RBD. Of these, 81% are currently in unfavourable condition, and for 30% of sites this is due, at least in part, to pressures from the water environment. In the Neagh Bann RBD there were 24 water-dependent European sites; of these 75% are currently in unfavourable condition, and for 25% this relates to water pressures. A total of 25 water-dependent European sites were identified for the North Eastern RBD, of which 56% are currently in unfavourable condition, with 12% of sites due to water pressures. For Northern Ireland as a whole, 71% of water-dependent European sites are currently in unfavourable conservation condition (i.e., failing to meet their conservation objectives), with these failures relating to pressures from the water environment in 23% of sites.

3.2.1.5.2 Freshwater Pearl Mussel

The freshwater pearl mussel, *Margaritifera margaritifera*, is a large bivalve mollusc that lives in the bed of rivers and streams. It is highly sensitive to changes in water quality, particularly concerning nutrient pollution and sediment loading. In Northern Ireland, the species formerly occurred widely in several catchments, with the species extant in six rivers (**Figure 3-2**). Three SACs are designated for freshwater pearl mussel of the Owenkillew River, Ballinderry River, and Swanlinbar (Cladagh) River (National Museums Northern Ireland, 2018). Two ASSIs are designated for freshwater pearl mussel of the Owenreagh River (tributary of Owenkillew River) and Tempo River. There are also populations present on the Waterfoot River which is a proposed ASSI. Populations of freshwater pearl mussel are considered extinct in eleven rivers; Blackwater, Bush, Broughderg, Colebrooke, Derg, Finn, Glenelly, Moyola, Mourne/Strule and the Upper Bann.

A Species Action Plan for freshwater pearl mussel in Northern Ireland was published in 2005 (DAERA, 2005), which outlined the status of populations at that time, factors contributing to loss or decline of the species, and both current and proposed actions to protect the species. This indicated that the species had undergone a large decline in absolute numbers and range but, in at least three rivers, over one million individuals remained. However, populations were characterised by an ageing cohort, with little or no recent recruitment. Article 17 reporting for the UK as a whole, in the period 2013-2018 indicates that freshwater pearl mussel is currently at 'Unfavourable-Bad' conservation status (JNCC, 2019a). Northern Ireland's supporting documentation for the conservation status assessment of the species states that the area and quality of occupied / unoccupied habitat is not sufficient to maintain the species at Favourable Conservation Status, and that the lack of juvenile recruitment and an ageing population is expected to lead to the future extinction of the species from Northern Ireland, unless a significant improvement of their habitat conditions occurs (JNCC, 2019b). Owing to the sensitivity of the species, pressures and threats relating to water quality are of great importance. The following are listed as pressures / threats of high-ranking importance for the species in Northern Ireland:

- Agricultural activities generating diffuse pollution to surface or ground waters;
- Forestry activities generating pollution to surface or ground waters;
- Mixed source pollution to surface and ground waters (limnic and terrestrial);
- Modification of hydrological flow; and

- Physical alternation of water bodies.

3.2.1.5.3 Areas Designated to Protect Economically Significant Aquatic Species

Shellfish water protected areas (**Figure 3-2**) are areas designated for the protection of shellfish growth and production. Good water quality within these areas is important for the production of high-quality shellfish. Both the Shellfish Directive (79/923/EEC) and Freshwater Fish Directive (78/659/EEC) were revoked in 2013 and subsumed into the WFD. Areas previously designated under these Directives are now areas designated for the protection of economically significant aquatic species under the WFD and listed on the Protected Areas register.

Within the North Eastern RBD, 662km of rivers, 5.5 km^2 of canals and 2 km^2 of lakes are designated for fish (NIEA, 2015a), while in the North Western RBD there are 1681 km of rivers and 149 km^2 of lakes designated and in the Neagh Bann RBD there are 1936 km of rivers, 43 km of canals and 292 km^2 of lakes designated (DAERA, 2025a) (**Figure 3-2**). In addition to designated species, fish species in general can be significantly affected by changes in water quality and sedimentation, particularly in spawning and nursery areas, as well as by changes in the hydrology of surface water bodies, including those that may affect the passage of migratory species.

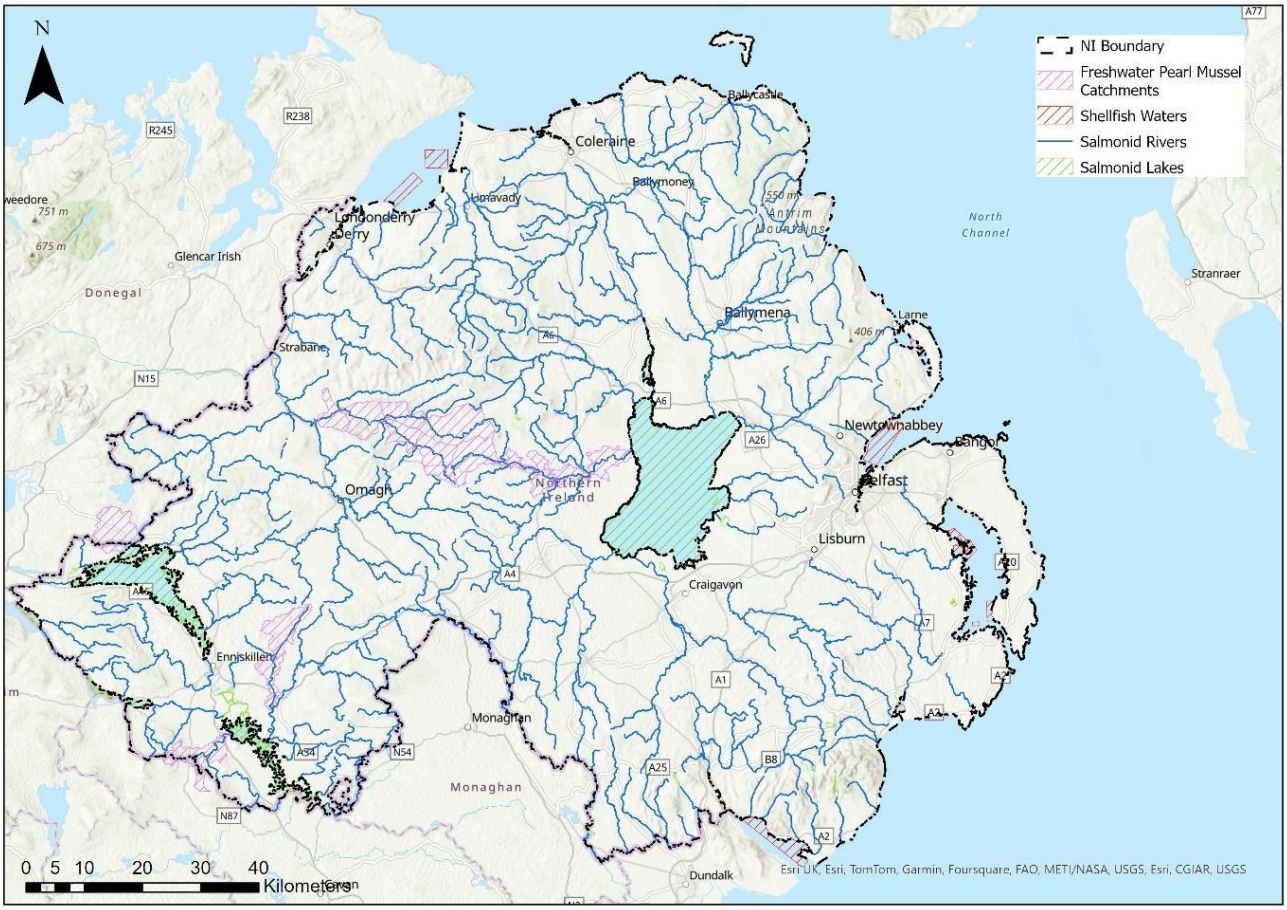

Figure 3-2: Designated Freshwater Pearl Mussel sites, Shellfish Waters and Salmonid waters across Northern Ireland

3.2.1.6 Summary of Existing Pressures and Issues for Biodiversity, Flora and Fauna in Northern Ireland

Despite an increase in actions to halt biodiversity loss, many elements of biodiversity in Northern Ireland are continuing to show declines (NIEA, 2013). The latest State of Nature (2023) report for Northern Ireland has estimated that 12% of species are threatened with extinction (based on species assessed using the International Union for Conservation of Nature Regional Red List criteria). Impacts of human activities, particularly land use change associated with agriculture and development, pollution, and fisheries (particularly in the marine environment), are key pressures affecting biodiversity in Northern Ireland. Invasive non-native species are also

a significant threat to native biodiversity. Development such as housing and infrastructure associated with population growth has contributed to a loss of terrestrial and freshwater habitats, with over 40,000 hectares of countryside lost through urban development since the 1950s. Land use change to support agricultural practices has included land reclamation, drainage, increased production and stocking rates, and subsequent impacts on water and air quality.

Priority habitats, and particularly grassland habitats, in Northern Ireland have shown an overall decline since 2000, while a significant number of priority species such as breeding waders are also showing declines. The latest UK Article 17 reporting for habitats and species protected at a European level found that only 6% of habitats and 35% of species are currently in a favourable conservation condition, and that 22 habitats and 12 species showed a decline in condition since the previous reporting period. Monitoring of features within nationally protected sites has shown that just 38% of habitats and 57% of species features are in a favourable condition.

Implementation of the Plan, and measures therein, has the potential to lead to positive or negative effects on biodiversity in Northern Ireland alone, or in combination with, these existing pressures. Regarding badgers, where the implementation of the Plan, specifically in relation to the potential Wildlife Intervention Options, will lead to a reduction in badger numbers on a regionalised basis if culling approaches are taken, there is potential for direct negative effects. There is potential for positive or negative effects on habitats and species at a local, regional or national level, through both direct and indirect pathways. This includes the potential for negative effects on the condition of habitats and species protected at a national and international level with the potential for disturbances from introduced wildlife intervention methods.

3.2.2 Population & Human Health

The population and human health topic considers the presence and wellbeing of people, and their activities and use of receiving environments. Population size, growth predictions and distribution within an area can indicate both the potential pressures that people may exert on resources and infrastructure, and the potential to which they may be exposed to pollution, disturbance, or other risks. Health of a population can be adversely affected through several direct and indirect pathways, including through emissions to water and air, health and safety risks, noise and other disturbance.

It is considered that the key issues associated with implementation of the Plan and the potential Wildlife Intervention Options and Population and Human Health comprise:

- Potential for direct and indirect effects on water quality (drinking and recreational activities);
- Potential effects on food quality (commercial aquatic species);
- Potential effects on air quality (through noise disturbance);
- Potential for health and safety risks from the use of firearms; and
- Potential risks from biohazards (carcases and exposure to bTB).

3.2.2.1 Population Demographics for Northern Ireland

The total population of Northern Ireland in 2024 was approximately 1.93 million people (NISRA, 2025b) and is predicted to increase to approximately 1.95 million individuals by 2033. The population is projected to fall to 1.93 million by 2047 (NISRA, 2025c). Population growth has been positive for the past 25 years, and over the decade from mid-2010 to mid-2020 increased at an annual growth rate of 0.5%. The period from mid-2019 to mid-2020 showed the lowest level of population growth in over 20 years, at 0.1%, influenced by the Covid-19 pandemic and the UK's exit from the EU, and their effects on the death rate and net migration, respectively (NISRA, 2021). Between mid-2023 to mid-2024 the population of Northern Ireland increased by 7,500 people (0.4%) (NISRA, 2025b).

Over two-thirds of all residents in Northern Ireland aged 16 to 64 years were economically active in the 2021 census (70.2%); these were primarily composed of full-time and part-time employees. In 2021, most district council areas in Northern Ireland saw an increase in employee jobs (NISRA, 2025d).

3.2.2.2 Population Health

In 2021-2023, life expectancy at birth was 78.8 years for men and 82.5 years for women living in Northern Ireland (DoH, 2024), an increase from 69 and 76, respectively, since the base reporting period of 1980-1982.

However, over the last ten years life expectancy growth has stalled for both males and females. Northern Ireland has an ageing population, with 18.1% aged over 65 years, and it is projected that the over 65-year population will be larger than the number of children (0-15 years) from mid-2027 onwards (NISRA, 2025c). The primary causes of death for people in Northern Ireland in 2024 were cancer (25.6%, most commonly bronchus or lung) and circulatory (22.7%), and respiratory (12.8%). Other causes accounted for 32.2% of all deaths in Northern Ireland.

In the Northern Ireland census in 2021, just under four-fifths (78.7%) of Northern Ireland residents reported themselves to be of good or very good general health. Over one in five of the resident population (24.3%) had a long-term health problem or disability, which limited their day-to-day activities. The most common long-term conditions among the resident population were long-term pain or discomfort (11.6%), or a mobility or dexterity problem (10.9%) (NISRA, 2022).

3.2.2.2.1 Air Pollution and Health Risk

Good air quality is essential for human health and wellbeing. Air pollution generally, and particularly that arising from the transport sector, is recognised as a significant health burden in terms of illness and premature death. Nitrogen dioxide (NO_2) belongs to a group of gaseous air pollutants that are produced by road traffic and other forms of domestic and industrial combustion. This can be a lung irritant and can lower resistance to respiratory infections such as influenza; frequent or continuous exposure to high concentrations can result in increased incidence of acute respiratory illness in children (NISRA, 2025a). The annual mean concentration of NO_2 in 2024 for urban background sites was 11.3 µg/m^3 and for urban roadside sites was 22.6 µg/m^3, generally these values have declined since monitoring has taken place since 2011. Particulate matter (PM) in the atmosphere that has a diameter of ≤10 microns (PM_{10}) originate from both natural and man-made sources. PM is formed as a by-product of burning fuels, particularly solid fuels; in Northern Ireland, the biggest sources of PM are domestic wood and coal burning, industrial combustion and road transport (DAERA, 2020). Fine particles can cause lung inflammation, and can exacerbate symptoms of heart and lung disease, as well as potentially transmitting carcinogenic compounds. The annual mean concentration of PM10 in 2024 for urban sites was 13 µg/m^3 and for rural sites was 7 µg/m^3.

3.2.2.2.2 TB Incidences

Globally, TB was the leading cause of death from a single infectious agent in 2023, with 1.4 million deaths. The incidence of TB within the human population in the UK has been increasing, however the World Health Organization classifies the UK as a low TB incidence country with an overall incidence rate of 8.6 per 100,000 people. Within Northern Ireland, the 2024 TB incidence rate was 4.5 per 100,000 population (HSC NI, 2025a), with 86 cases of active TB diseases formally notified to the Public Health Service. There has been an increase in overall cases reported since 2021, and a 10.3% notification increase since 2023. Of these cases, 62.8% were male, and the mean age was 44 years; 74.7% of cases were successfully treatable within 12 months.

Spatially, the highest number of cases were reported in Belfast, followed by Mid Ulster and Armagh City, Banbridge and Craigavon. Of the 86 cases reported, 50 underwent microbiological culturing to determine the infection, 47 were confirmed as *M. tuberculosis,* with three cases as *M. bovis*. Typically, the risk of infection by TB can be linked to social risk factors, including close contact with infectious individuals, alcohol or drug misuse, homelessness or due to a weakened immune system (HSC NI, 2025b). TB is spread primarily through the air due to the release of small droplets containing the bacteria. The farming community is at a slightly elevated risk for contracting TB, however several steps can be taken to reduce the risk of exposure, including regular hand washing, washing any skin wounds with soap and warm water before covering with a dressing, avoidance of drinking unpasteurized milk and avoiding the consumption of food and drinks in animal areas.

Within humans, symptoms of bTB infection are similar to human TB and include weight loss, fever, night sweats and a persistent cough. Standard anti-TB treatment involves daily taking of a combination of four different antibiotics for a minimum period of six months (UK Health Security Agency, 2026).

3.2.2.3 Noise

Noise pollution can have negative implications for human health through disturbance. Further information regarding noise and the potential for the Wildlife Intervention Options to contribute to noise impacts is detailed in **Section 3.2.5.3** under the SEA topic of Air. Excessive noise pollution has been linked to symptoms of sleep disturbance, effects on general wellbeing, mental ill health and can lead to or exacerbate conditions such as

psychological stress or cardiovascular diseases (Razai and Majeed, 2025). Typical sources of noise can be partitioned by the predominant environment of rural or urban areas. Noise sources can include traffic noise, air traffic noise, construction noises as well as demolition or animal noises. Within Northern Ireland, night hours are considered from 11:00pm until 07:00am with regard to noise, with a maximum amount of noise which can be permitted during night hours from houses and premises (NI Direct, 2025). Under the Clean Neighbourhoods and Environment Act, councils have the authority to take action against noise generated from premises and land which is considering as being damaging to health or causing a statutory nuisance. The implementation of the Wildlife Intervention Options has potential for noise disturbance via culling, of which this is likely to be occurring predominantly in rural areas of lower background noise sources, potentially amplifying the noise of any shooting. Given the nocturnal nature of badgers, such activities will likely occur at night, further increasing the potential for disturbances on local populations and potential negative impacts on human health.

3.2.2.4 Water Pollution and Health Risk

Implementation of culling as part of the Wildlife Intervention Options may have the potential for localised impacts on water quality, which may impact human health. Should culled badger carcasses fail to be removed from an area following dispatch, there is potential for localised contamination of watercourses or soils to occur (which may also impact groundwater sources). Furthermore, the potential for the use of lead shot during culling activities could lead to localised contamination within both terrestrial and aquatic environments. Lead is toxic to both humans and other vertebrate animals and can lead to brain and kidney damage and interference with red blood cell production. Shot fragmentation and ingestion may potentially occur if spent lead-shot fails to be recovered, with the potential for food chain impacts. Presently the use of lead shot is restricted in order to protect waterbirds from lead poisoning via The Environmental Protection (Restriction on Use of Lead Shot) Regulations (NI) 2009. This legislation prevents the use of lead shot on or over any areas of wetland (e.g., marshes, fens, peatlands with water, tidal areas) for any shooting activity. It is currently proposed to ban the use of lead shot in the UK for almost all situations with legislation due for introduction in 2026.

Should water contamination occur there may be potential for secondary impacts on water-dependent habitats and sensitive species or on water dependent habitats such as shellfish waters or bathing waters. However, the potential for contamination from badger carcasses and lead-shot contamination on watercourses and soil sources is considered to be low and very localised.

3.2.2.4.1 Drinking Water Quality

The availability of a clean water supply is essential for the general health of the population of Northern Ireland. Contaminants that can have a negative effect on human health arise from biological sources (e.g., *Cryptosporidium*, verotoxigenic *E. coli* [VTEC]) and also from chemical sources (e.g., from pesticides, herbicides, fertiliser, heavy metals, total trihalomethanes [THMs], pharmaceuticals).

Incidents of water pollution are investigated by NIEA. In 2024, there were 1,866 water pollution incidents reported of which 887 (47%) were substantiated as having an impact on the water quality of the receiving waterbody, with 13% as High or Medium Severity, a decrease of 28% compared to 2023 incidents. Of these incidents, farming (32.4%) accounted for the greatest proportion of incidences in 2024, followed by Other (29.5%), Domestic (12.9%), Northern Ireland Water Limited (NI Water) (8.9%) and Transport (1.7%).

In Northern Ireland, over 99% of the population receive their drinking water from NI Water, with the remainder served by private water supplies. Quality compliance of drinking water is assessed against the EU Directive on Drinking Water Quality 98/83/EC, as enacted nationally through the Water Supply (Water Quality) Regulations (NI) 2017 and the Private Water Supplies Regulations (NI) 2017.

Drinking Water Protected Areas (DWPAs) are designated under Article 8 of The Water Environment (WFD) Regulations (NI) 2017, with the aim of protecting the safety of drinking water supplies and reducing the need for additional treatments. There are 26 surface water DWPAs and 65 groundwater DWPAs in Northern Ireland. Surface water DWPAs are related to the surface water catchments that provide a supply of freshwater to the intakes of the public drinking water supplier NI Water. The 3rd cycle RBMP for Northern Ireland updates the status of DWPAs, with 92% of groundwater DWPAs are currently at good status, and 8% at poor status. For surface water DWPAs, 57.7% of sites (15 out of 26) had at least one parameter that exceeded the drinking water standard in the raw (i.e., pre-treatment by NI Water) water intake during the 2nd cycle.

3.2.2.4.2 Economically Significant Aquatic Species Protected Areas (Shellfish Areas)

Shellfish water protected areas (SWPAs) are areas designated for the protection of shellfish growth and production. Good water quality within these areas is important for the production of high-quality shellfish. The Shellfish Directive (79/923/EEC) was revoked in 2013 and subsumed into the WFD under Regulation 9 of the Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017. Areas previously designated under this Directive are now managed under the WFD and listed on the Protected Areas register. All SWPAs must be managed to ensure that they meet ecological and chemical objectives under the WFD. They must also meet at least Class B status classification by the Food Standards Agency (FSA) under the Food Hygiene Regulations, to ensure that the quality of shellfish harvested are sufficient to protect public health. SWPAs must also make progress to meet a WFD microbiological guideline standard of ≥75%of samples containing ≤230 *E.coli* in the shellfish flesh and intervalvular liquid.

There are currently 10 SWPAs in Northern Ireland (**Figure 3-3**), as detailed in **Table 3-5**. Shellfish Action Plans have been established for these sites and will next be reviewed on a priority basis starting in 2021. SWPAs are managed by DAERA's Marine and Fisheries Division to ensure no deterioration in water quality, and that progress is made towards compliance with guideline standards. **Table 3-5** outlines the most recent status of these sites, as given in the Northern Ireland Environmental Statistics Report (NISRA, 2025a). A total of four out of nine (44%) designated shellfish waters complied with the guideline *E.coli* standard in 2024, an improvement from 2023 when only one site was compliant (no data was available for Marlfield SWPA in Strangford Lough for several years as shellfish harvesting has not recently occurred here). The 3rd cycle RBMP for 2021-2027 indicates the status of surface water bodies associated with these sites; according to the surface water classification for 2021, nine of the ten surface water bodies were at moderate ecological water status and one at good status.

Table 3-5: Location and Status of Shellfish Water Protected Areas in Northern Ireland

Site Name	WFD Status 2021	WFD Target 2027	FSA Classification 2021	WFD *E.Coli* Guideline 2024
Larne Lough	Moderate	Good	B	Met guideline
Belfast Lough	Moderate	Good	B/C*	Did not meet guideline
Strangford Lough – Paddy's Point and Reagh Bay	Moderate	Good	A	Met guideline
Strangford Lough – Skate Rock	Moderate	Good	B	Met guideline
Strangford Lough – Marlfield Bay	Moderate	Good	N/P	Not Designated or Not in Production
Killough Harbour	Moderate	Good	B	Did not meet guideline
Dundrum Bay	Moderate	Good	B/C**	Did not meet guideline
Lough Foyle, Longfield Bank	Moderate	Good	B	Did not meet guideline

Site Name	WFD Status 2021	WFD Target 2027	FSA Classification 2021	WFD *E.Coli* Guideline 2024
Lough Foyle, Balls Point	Moderate	Good	B	Met guideline
Carlingford Lough	Moderate	Good	B***	Did not meet guideline

*B status for all sites in Belfast Lough apart from a B/C status for Dougold and Henning sites (seasonal classification)

**B Status for Inner North Mussels & C Status for Inner South Mussels

***B Status for all sites in Carlingford Lough apart from a B/C Status at Narrow Water Wild Fishery (seasonal classification)

3.2.2.4.3 Bathing Water Protected Areas

The Bathing Water Directive (Directive 2006/7/EC concerning the management of bathing water quality and repealing Directive 76/160/EEC) required each member state to identify its most popular bathing waters for regular testing in order to ensure that a minimum quality standard is reached and is implemented in Northern Ireland by 'The Quality of Bathing Water (Northern Ireland) Regulations 2013. There are 33 designated bathing waters in Northern Ireland (**Figure 3-3**), as detailed in **Table 3-6**. These are monitored weekly from May to September, and classified into one of four categories:

- Excellent;
- Good;
- Sufficient; or • Poor.

Classifications are based on the presence of *E.coli* in water samples. Individual sample results below 250 *E.coli* (EC)/ 100 ml and 100 Intestinal Enterococci (IE)/100 ml are typical of an 'Excellent' classification. Results below these values, and up to 500 EC/ 100 ml and 200 IE/100 ml are typical of a 'Good' or 'Sufficient' classification. When *E.coli* levels exceed 1250 EC/100 ml, temporary advice against bathing is issued. Temporary advice against bathing is also provided with respect to the levels of blue-green algae present based on the WHO's guidelines on the safe thresholds of blue-green algae. The most recent assessment of bathing water quality compliance at these sites from 2025 classified 24 as 'Excellent' quality, five as 'Good' quality, three as 'Sufficient' quality, and one as 'Poor' quality for bathing. According to the 3rd cycle RBMP, over the assessment period of 2015-2020, 25 of the 26 bathing water sites monitored consistently met the minimum standard (sufficient). Of these, 11 sites consistently met the 'excellent' standard, eight sites consistently met 'excellent' or 'good' standard, and five sites consistently met 'good' or 'sufficient' standard. Only one site, Ballyholme, failed to meet the 'sufficient' standard over this period (in two of the six years monitored). Investigations by DAERA have shown that this site is situated in a complex catchment, vulnerable to pressures from agricultural run-off and overflows from the WTW network. Management measures that should be considered to prevent pollution and physical disturbance to these sites are included in DAERA's Bathing Water Profiles.

Table 3-6: Location and Status of Bathing Water Sites in Northern Ireland

Bathing Water	2025 Compliance Level
Ballycastle	Excellent
Ballygally	Excellent
Ballyhornan	Excellent
Brown's Bay	Excellent
Carnlough	Excellent

Bathing Water	2025 Compliance Level
Castlerock	Excellent
Cloughey	Excellent
Cranfield	Excellent
Crawfordsburn	Excellent
Cushendall	Excellent
Groomsport	Excellent
Helen's Bay	Excellent
Kilclief	Excellent
Magilligan (Benone)	Excellent
Magilligan (Downhill)	Excellent
Millisle	Excellent
Murlough (Co Down)	Excellent
Portballintrae Salmon Rock	Excellent
Portmuck	Excellent
Portrush Curran (East Strand)	Excellent
Portrush Mill (West Strand)	Excellent
Portrush Whiterocks	Excellent
Portstewart	Excellent
Tyrella	Excellent
Ballyholme	Good
Ballywalter	Good
Brompton	Good
Drain's Bay	Good
Waterfoot	Good

Bathing Water	2025 Compliance Level
Donaghdee	Sufficient
Newcastle	Sufficient
Warrenpoint	Sufficient
Rea's Wood (Inland)	Poor

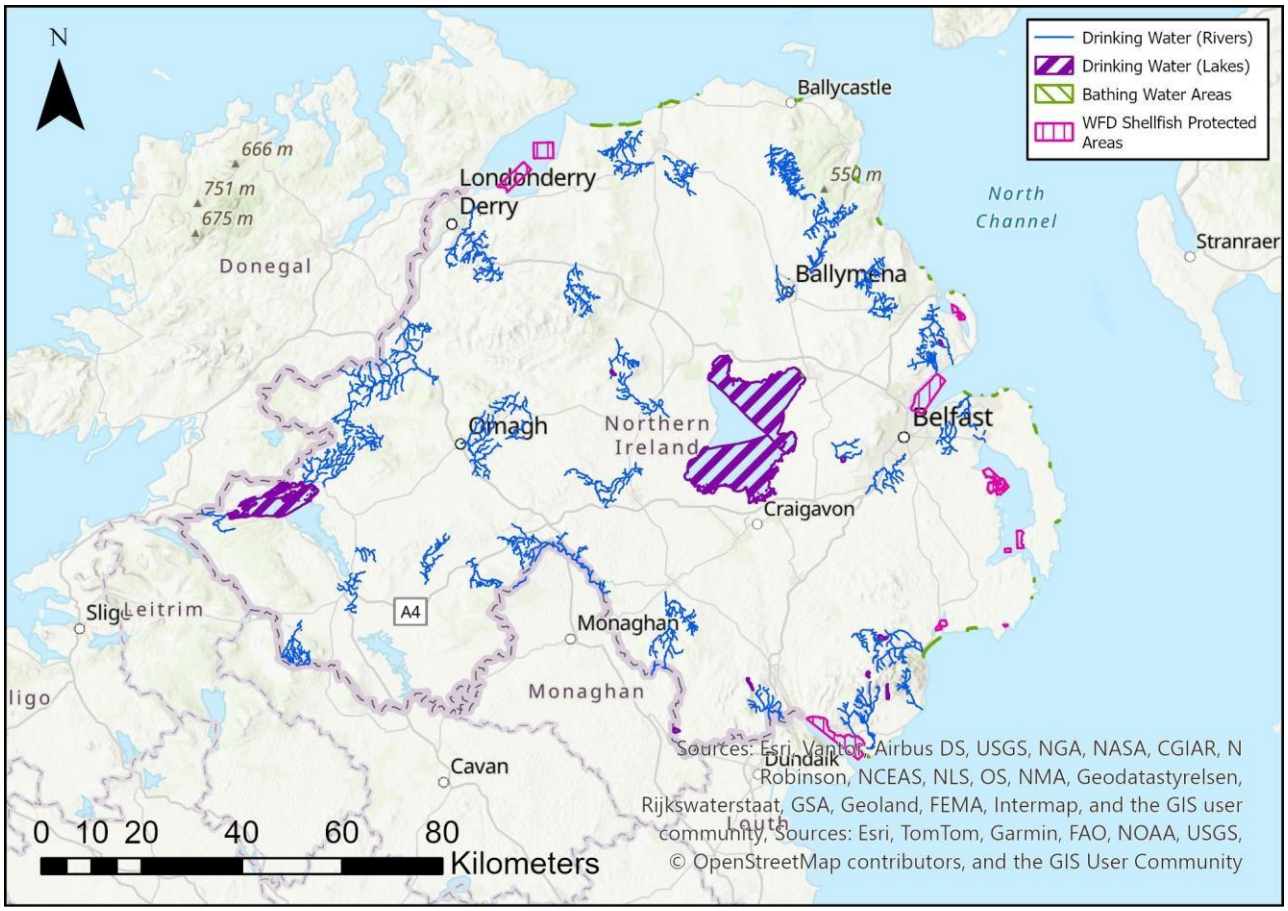

Figure 3-3: WFD Protected waterbodies across Northern Ireland

3.2.2.5 Health and Safety Risks

The implementation of the Wildlife Intervention Options has the potential to lead to health and safety risks for both the general public and for those implementing the intervention methods. There is potential for exposure to TB to occur for those implementing the intervention methods through contact with infected badgers during culling or vaccination activities. Appropriate measures should be taken to avoid exposure to both live animal biting and exposure to infected carcasses. Should carcasses fail to be removed appropriately, there is potential for the general public to be exposed to TB or potentially other infectious disease and/or parasites.

The use of culling may involve the use of firearms (in addition to injection-based euthanasia). The possession of firearms is currently regulated through the Firearms (Northern Ireland) Order 2004, which also outlines prohibited weapons, licensing requirements and the process for applications and appeals regarding firearms. With the use of culling within intervention areas potentially including publicly accessible locations, there may be potential for health and safety risks from members of the public entering into areas of active shooting.

Gunfire can result in damage to ears and hearing loss from prolonged use known as shooter's ear with muffled speech, tinnitus or difficulty understanding speech. This is due to gunshots reaching sounds of 140 decibels or more, where the exposure to sounds above 85 decibels can cause hearing damage. The Control of Noise at Work Regulations (Northern Ireland) 2006 requires employers to safeguard employees against the harmful effects of excessive noise in their work environment.

3.2.2.6 Summary of Existing Pressures and Issues for Population and Human Health in Northern Ireland

According to the most recent State of the Environment report (NIEA, 2013), air and water quality pose little overall risk to public health in Northern Ireland. However, recent research has indicated that the effects of air pollution on human health are more extensive and complex than previously thought (DAERA, 2020), and a report by Public Health England (2014) estimated that, in 2010, 553 deaths in the over-25s in Northern Ireland were attributable to exposure to anthropogenic air pollution ($PM_{2.5}$). Subsequent cross-border assessment regarding air pollution and premature deaths on the Island of Ireland (2023) concluded that 2,600 premature deaths occur annually due to air pollution (1,700 in the Republic of Ireland and 900 in Northern Ireland) (Goodman et al., 2023). The report considers noise to be an emerging environment and health issue (according to some WHO findings, noise is the 2nd largest environmental cause of health problems, just after the impact of air pollution (particulate matter)), as well as the effects of climate change, depletion of stratospheric ozone, biodiversity loss and land degradation.

Implementation of the Plan measures, including the Wildlife Intervention Options, have the potential to lead to positive or negative effects on population and human health through air and water quality alone, or in combination with, these existing pressures. While air and water quality are not implicated as serious public health risks in Northern Ireland as a whole, on a more local level there may be implications on health through the potential for localised effects on drinking water if carcases are not removed appropriately or from lead-shot contamination. There is also potential for disturbance from noise activities associated with the Wildlife Intervention Options to impact on the health and wellbeing of local populations. The reduction in bTB infection rates has potential for indirect positive benefits on local populations through reduced bTB prevalence and infection risk.

3.2.3 Geology, Soils and Land use

Geology and soils, together with their associated land use, provide important pathways and functions that support ecosystems. Furthermore, these also influence the persistence and movement of contaminants within soils and water sources. Soils are a non-renewable resource, which provide vital ecosystem services such as: filtration and transformation of nutrients; storage of carbon; regulation of flows and storage of surface water; provision of habitats; and support of biodiversity and food production. Depending on their condition and land use, soils may be degraded, disturbed or lost through activities that result in compaction, poaching, erosion, sediment loss or changes in fertility.

It is considered that the key issues associated with implementation of the Plan and the potential Wildlife Intervention Options and Geology, Soils and Land use comprise:

- Potential for temporary localised effects on soil through soil loss or disturbances should trapping be introduced under the Wildlife Intervention strategies and through accessing badger habitat areas;
- Potential for localised contamination effects from lead and/or TB; and
- Potential for localised effects on discharges to receiving aquatic sediments / groundwater sources.

3.2.3.1 Geology of Northern Ireland

3.2.3.1.1 Bedrock Geology

Northern Ireland has a varied geological landscape for its size (14,000 km^2). Many of the superficial deposits present in Northern Ireland formed during Ice Ages and interglacial periods over the last 2-3 million years. The most abundant of these are glacial sediments, composed of clay, silt, sand and gravel, which were deposited by the successive growth and decay of former ice sheets. Other types of sediments formed across Northern

Ireland, associated with lakes, rivers, estuaries and coastlines. Additionally, in areas with suitable conditions peat has accumulated.

Below the superficial deposits or soil cover, older rocks are present. These may be sedimentary, igneous or metamorphic rock and range in age from a few 10s of millions of years old (e.g. the Tertiary aged igneous basalt of the Antrim Plateau) to hundreds of millions of years (e.g. the Carboniferous aged sedimentary rocks in Fermanagh). The rocks in the north-west area are dominated by metamorphosed sedimentary rock formed by geological processes approximately 600 million years ago.

The geological history of Northern Ireland has been varied, with periods of erosion and landmass formation that did not occur in a homogenous manner across the region. In some instances, unconformities are present due to uplift and erosion. Similarly, geological faults (e.g., the Omagh Fault) are present.

At a high level, the bedrock geology of Northern Ireland (**Figure 3-4**) can be separated into four contrasting areas from oldest to youngest:

- The oldest rocks in Northern Ireland occur as two small inliers called the Lough Derg Inlier in western Fermanagh and the Central Inlier in Co. Tyrone. The precise age of these rocks in not known but radiometric dating has given an age of 895±60Ma. The Sperrin Mountains in Derry/Londonderry and Tyrone contain the next oldest sequence of rocks of mid- to late Neoproterozoic age. The Sperrin Mountains were formed from the alteration of sedimentary and volcanic rocks. Initially, the sedimentary sequences were composed of sandstone, mudstone and limestone, which accumulated in an ancient ocean. Underwater lava eruptions resulted in the development of volcanic rock layers on the ocean floor. When continental drift resulted in the ocean closing, these oceanic rocks underwent deep burial and deformation. The high temperatures and pressure produced metamorphic rocks (e.g., schist) which were pushed up and over younger rocks forming a faulted contact in the south-east (i.e., the Omagh Fault).
- The Down-Longford area to the south-east is composed of basement rocks of Ordovician - Silurian age. The Down-Longford area is mainly composed of greywacke sandstone, siltstone, with mudstones also present, which have been weakly metamorphosed. To the south of this area, magma intrusions forming igneous rocks are present, such as in Newry (~400 Mya) and the younger Mourne Mountains (56 Mya).
- The Lakelands (County Fermanagh) in the south-west are predominantly a combination of early Devonian to mid Carboniferous aged sedimentary bedrock composed of limestone, sandstone and mudstone (approximately 400 – 337 Mya). Specifically, an upper sandstone unit overlays carboniferous limestone. The sandstone and mudstone predominantly formed due to large amounts of sediment transported by large river deltas, whereas the limestones formed in shallow tropical seas. An extensive karst landscape exists within the Lakelands (i.e., the Cuilcagh Mountain area) due to the soluble nature of the limestone rock, which is readily subject to chemically weathering. The limestones in this region represent an important aquifer that forms part of the drinking water supply in the area.
- The Antrim Plateau in the north east is composed of flood basalts which erupted during the formation of the North Atlantic Igneous Province between approximately 62 and 55 Mya. Beneath the basalt, layers of sedimentary rock including Cretaceous aged chalk (90 - 65 Mya), Jurassic aged mudstones and limestones (200 - 145 Mya), and Triassic aged red mudstones and sandstones (250 – 195 Mya) are present. The early Triassic Sherwood Sandstone Group is an important aquifer, due to the porous nature of sandstone.

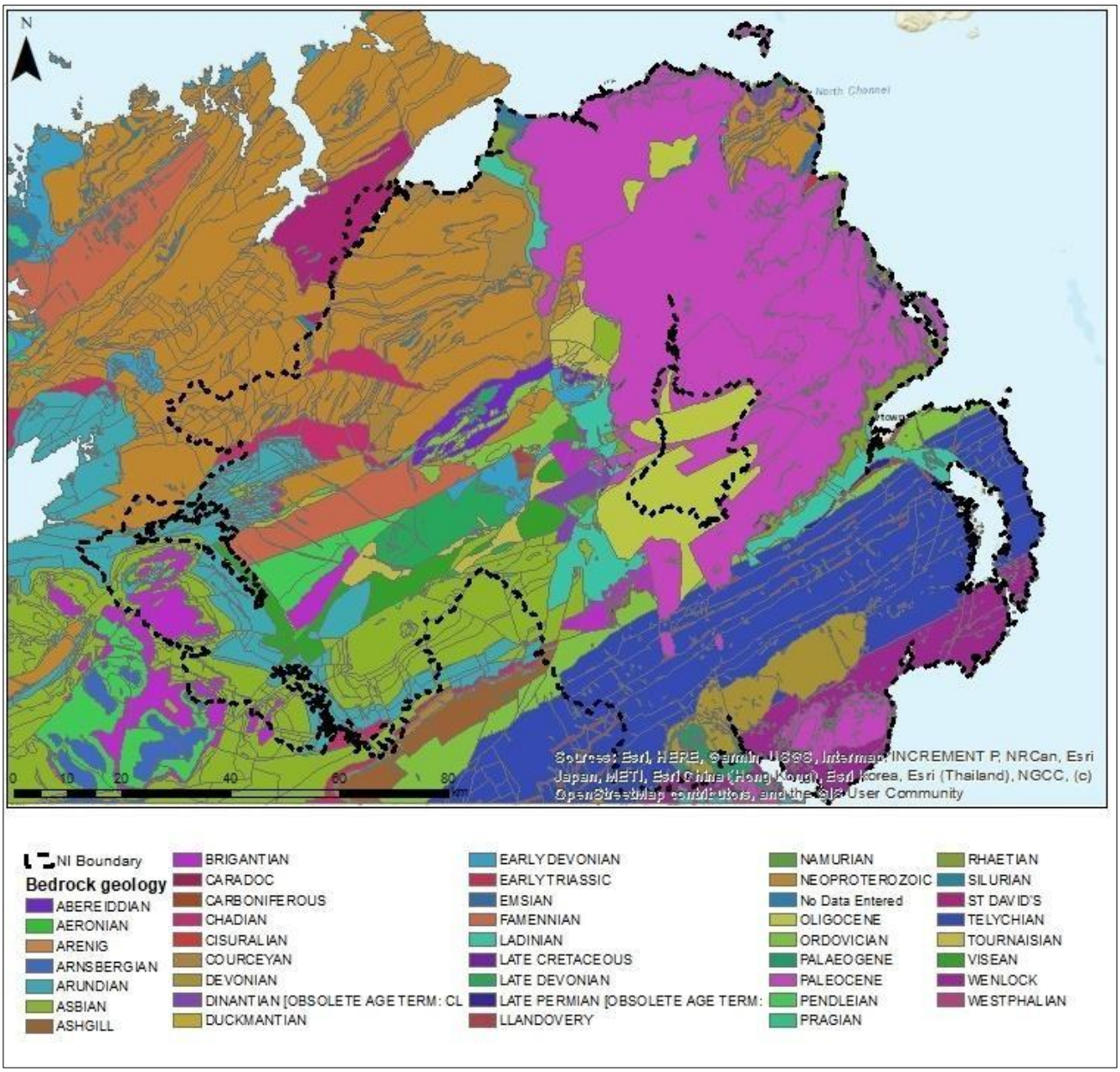

Figure 3-4: Bedrock Geology mapping across Northern Ireland by age

3.2.3.1.2 Hydrogeology and Groundwater Vulnerability

The major aquifers in Northern Ireland are associated with the younger sedimentary rocks of the Antrim Plateau, and the older sedimentary rocks in the south-west. Basement rocks, such as those found in The Sperrin Mountains and in the Down-Longford terrane, do not usually provide a water source except where intensely fractured and weathered near the surface, and so the nature of the rock types most commonly found is such that they generally represent only poorly to moderately productive aquifers. There are eleven distinct aquifers that have been classified within Northern Ireland. This includes 10 separate bedrock aquifers and unconsolidated superficial deposits. There are three primary types of aquifers in Northern Ireland: fracture, intergranular and karst (Wilson et al., 2023). The fracture aquifers include: (1) basalts; (2) Cretaceous (Chalk);

(3) Permo-Triassic Sandstones; (4) Upper Carboniferous Sandstones; (5) Carboniferous Limestones; (6) 'Old Red Sandstones'; (7) Greywackes; (8) Dalradian; (9) Intrusive igneous dykes and sills; and (10) Intrusive igneous plutonic. Intergranular aquifers include: (1) Permo-Triassic Sandstones; (2) Cretaceous (Chalk); and (3) superficial deposits, including glaciofluvial, alluvial and raised beach deposits. The only karst aquifers present in Northern Ireland are Carboniferous limestones.

A classification system was developed for Northern Ireland's aquifers to delineate groundwater bodies for the purses of WFD assessment, which was based on aquifer productivity potential and the groundwater flow mechanism (intergranular, fracture or karst). This includes eight classes of aquifer, comprising six bedrock aquifer types and two superficial aquifer types. In the Republic of Ireland, the aquifers are classed into three main groups based on their resource potential (Regionally or Locally Important, or Poor) and are further subdivided based on the type of openings in which the groundwater flows (through fissures, karst conduits or intergranular). The bedrock aquifer classes across Northern Ireland (at a scale of 1:250,000) and the twelve classes of bedrock aquifer for the Republic of Ireland (at a scale of 1:100,000) are described are described in **Table 3-7** and mapped in **Figure 3-5**.

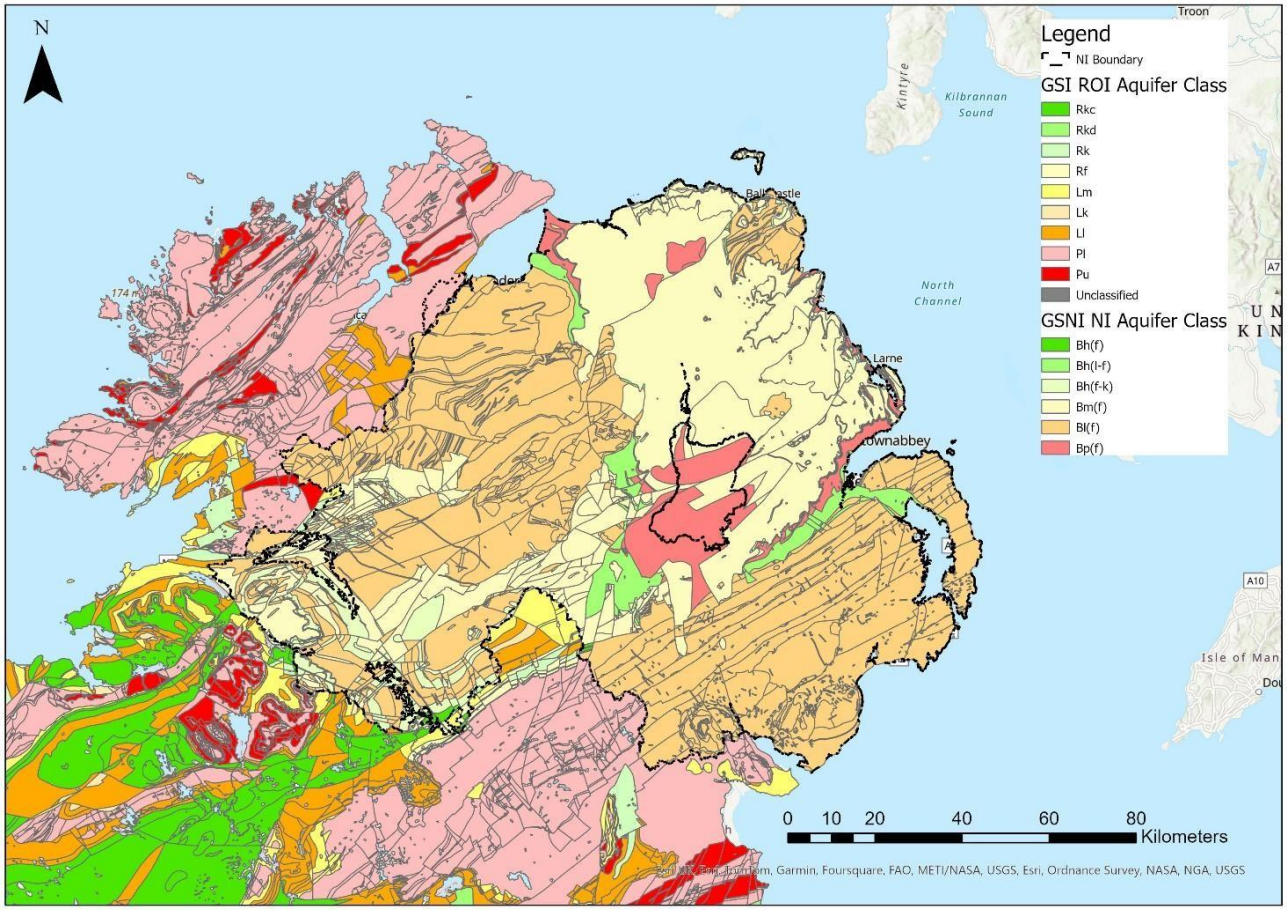

Figure 3-5: Aquifer classification across Northern Ireland and border regions of the Republic of Ireland

Table 3-7: Aquifer classification of bedrock in Northern Ireland and the Republic of Ireland

Aquifer Category	Symbol	Typical Rock Units/ Formations
Northern Ireland		
High productivity Fracture Flow	Bh (f)	Certain Carboniferous basal formations

Aquifer Category	Symbol	Typical Rock Units/ Formations
High Productivity Fracture/Intergranular Flow	Bh (I-f)	Permo-Triassic Sandstones
High Productivity Fracture flow with karstic element	Bh (f-k)	Carboniferous Darty Limestone with Knockmore Limestone Member (in places) Carboniferous Ballyshannon Limestone Formation Ulster White Limestone Formation (Chalk)
Moderate Productivity Fracture Flow	Bm (f)	Palaeogene Basalts Certain Carboniferous Dinatian Sandstones
Limited Productivity Fracture Flow	Bl (f)	Ordovician/Silurian strata Dalradian strata Devonian strata Granites and Intrusives
Poor Productivity Fracture Flow	Bp (f)	Lough Neagh Clay Group Mercia Mudstone Group Waterloo Mudstone Formation
Republic of Ireland		
Regionally Important Aquifer	Rkc	Karstified (conduit)
Regionally Important Aquifer	Rkd	Karstified (diffuse)
Regionally Important Aquifer	Rk	Karstified
Regionally Important Aquifer	Rf	Fissured bedrock
Regionally Important Aquifer	Rg	Sand/gravel
Regionally Important Aquifer	Rf/Rk	Fissured bedrock/Karstified

Aquifer Category	Symbol	Typical Rock Units/ Formations
Locally Important Aquifer	Lm	Bedrock
Locally Important Aquifer	Lk	Karstified bedrock
Locally Important Aquifer	Ll	Bedrock which is Moderately Productive only in Local Zones
Locally Important Aquifer	Lg	Sand/gravel
Poor Aquifer	Pl	Bedrock which is Generally Unproductive only in Local Zones
Poor Aquifer	Pu	Bedrock which is Generally Unproductive

The tendency and likelihood for general contaminants to reach the water table after introduction at the ground surface is termed groundwater vulnerability. This vulnerability is a combination of permeability and depth of superficial deposits or the depth to the water table in superficial aquifers. Where the soil and unsaturated zone are highly permeable, water can readily flow from the surface to the water-table and the aquifer is vulnerable. However, if the unsaturated zone and soil is clay rich, recharge is reduced, and the aquifer is less vulnerable.

Figure 3-6 indicates the groundwater vulnerability mapping across Northern Ireland (at a dataset resolution of 1:250,000). For the Republic of Ireland, the groundwater vulnerability mapping (at a dataset resolution of 1:40,000) is based on the type and thickness of subsoils with the presence of karst features. Karst landform features are also indicated which include boreholes, caves, dry valleys, enclosed depressions, estavelles, springs, superficial solution features, swallow holes and turloughs.

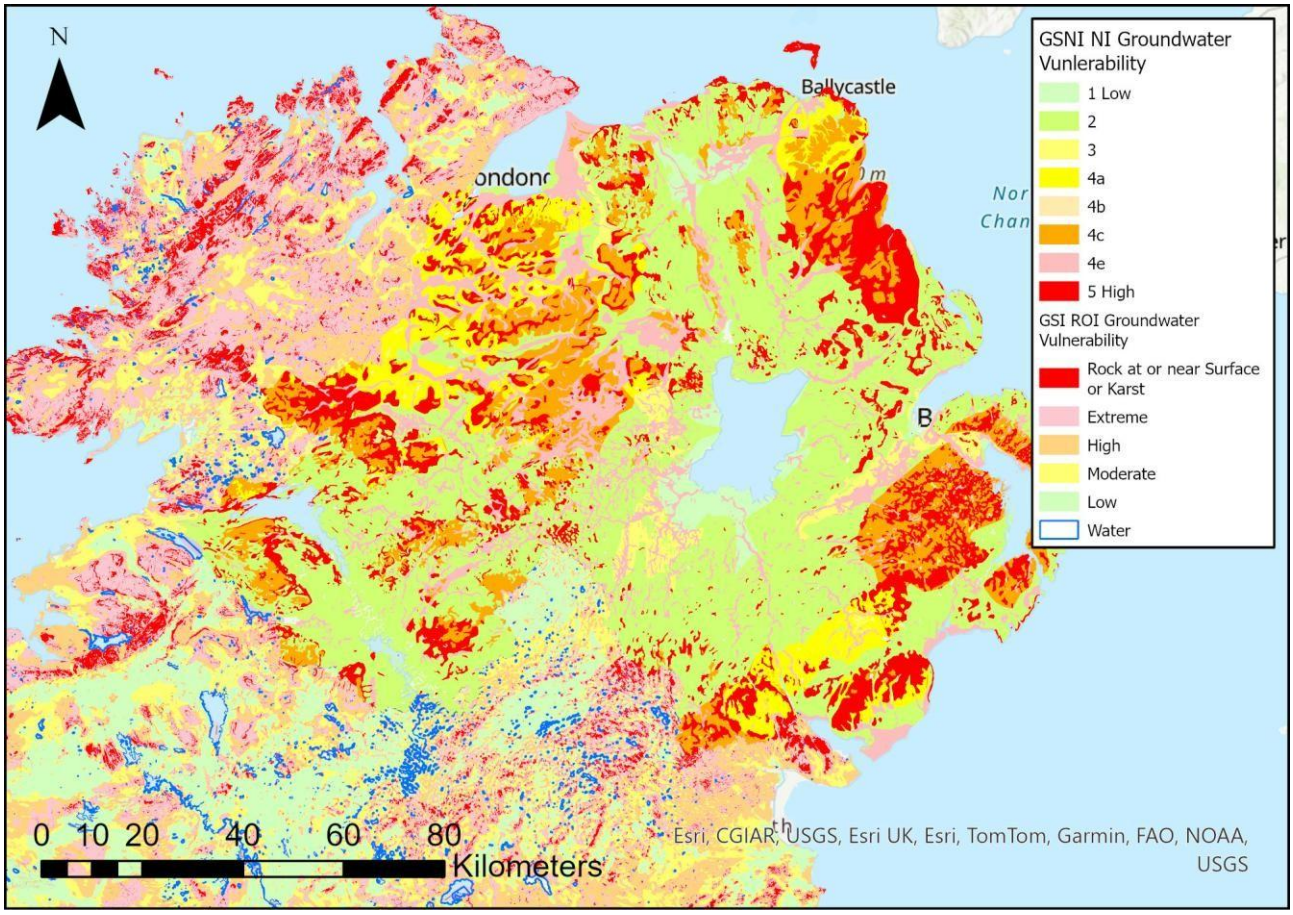

Figure 3-6: Groundwater Vulnerability mapping across Northern Ireland and border regions of the Republic of Ireland

In general, the areas of highest groundwater vulnerability are those with bedrock outcrops present, or where glacial sand and gravels are present, particularly in areas of higher elevation such as the Antrim Hills, Mourne Mountains and Sperrin Mountains. In general, areas of lowest vulnerability are those located at a lower elevation, which contain low permeability deposits such as till (Diamicton).

3.2.3.2 Soil Types in Northern Ireland

Throughout Northern Ireland, superficial deposits are made up largely of peat, alluvium (clay, silt and sandstone) and till. Northern Ireland is dominated by relatively poorly draining soils and low permeability glacial deposits which combine to reduce infiltration. A General Soil Map of Northern Ireland has been produced by AFBI (UKSO, 2026). This map identifies nine main soil types across Northern Ireland, as recognised by The World Reference Base map. These soils and their general occurrence are identified in **Table 3-8.**

Table 3-8: AFBI World Reference Base soil types across Northern Ireland

AFBI World Reference Base	General occurrence across Northern Ireland
Arenosols (sandy-textured soils that lack any significant soil profile development).	Located in coastal areas such as Murlough in County Down and Portrush in County Antrim.
Cambisols (soil in the beginning of soil formation)	Most prevalent in the south-east, around County Down.

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

3.2.3.3 Topography and Land Use in Northern Ireland

The topography of Northern Ireland is such that areas of lower elevation are predominantly located within the centre, where the largest lake in the British Isles, Lough Neagh, is situated. In all directions from this point, the land generally becomes steeper, culminating in highland regions on all sides. The Antrim Hills, which reach a height of over 550 m at Trostan, are to the north and east. In the south-east, the landscape includes drumlin hills, with Slieve Croob in County Down and the Mourne Mountain range rising to its highest point at Slieve Donard at over 850 m in elevation.

Land use in Northern Ireland, as identified within the Corine Dataset, is shown in **Figure 3-7** and summarised in **Table 3-9**. The predominant land use is 'Pastures' (9,074 km^2), followed by 'Natural grasslands' (1,046 km^2), 'Moors and heathland' (643 km^2) and 'Peat bogs' (558 km^2). Pastures, which comprise approximately 64% of land cover across Northern Ireland, are located across the country, with the exception of upland areas such as the Mourne Mountains in the south-east, the Antrim Hills in the north-east, the Sperrins in the west and raised bog peatland areas in mid-Ulster.

Approximately 77% of the total Northern Ireland land area (1.35 million hectares) is used for agriculture, including common rough grazing, and around 8.7% of the land area is used for forestry. Most farmland in Northern Ireland is under grass, in fact only 1,132 farms (4.6%) have arable or horticultural crops. In 2024, cattle were present on 20,232 farms (77.3%), sheep on 10,026 farms (38.3%) and cattle and/or sheep on 24,135 farms (92%), indicating the dominance of cattle within farming livestock in Northern Ireland (NISRA, 2024a). In addition, pigs and/or poultry (for commercial purposes) were present on 5.1% of farms.

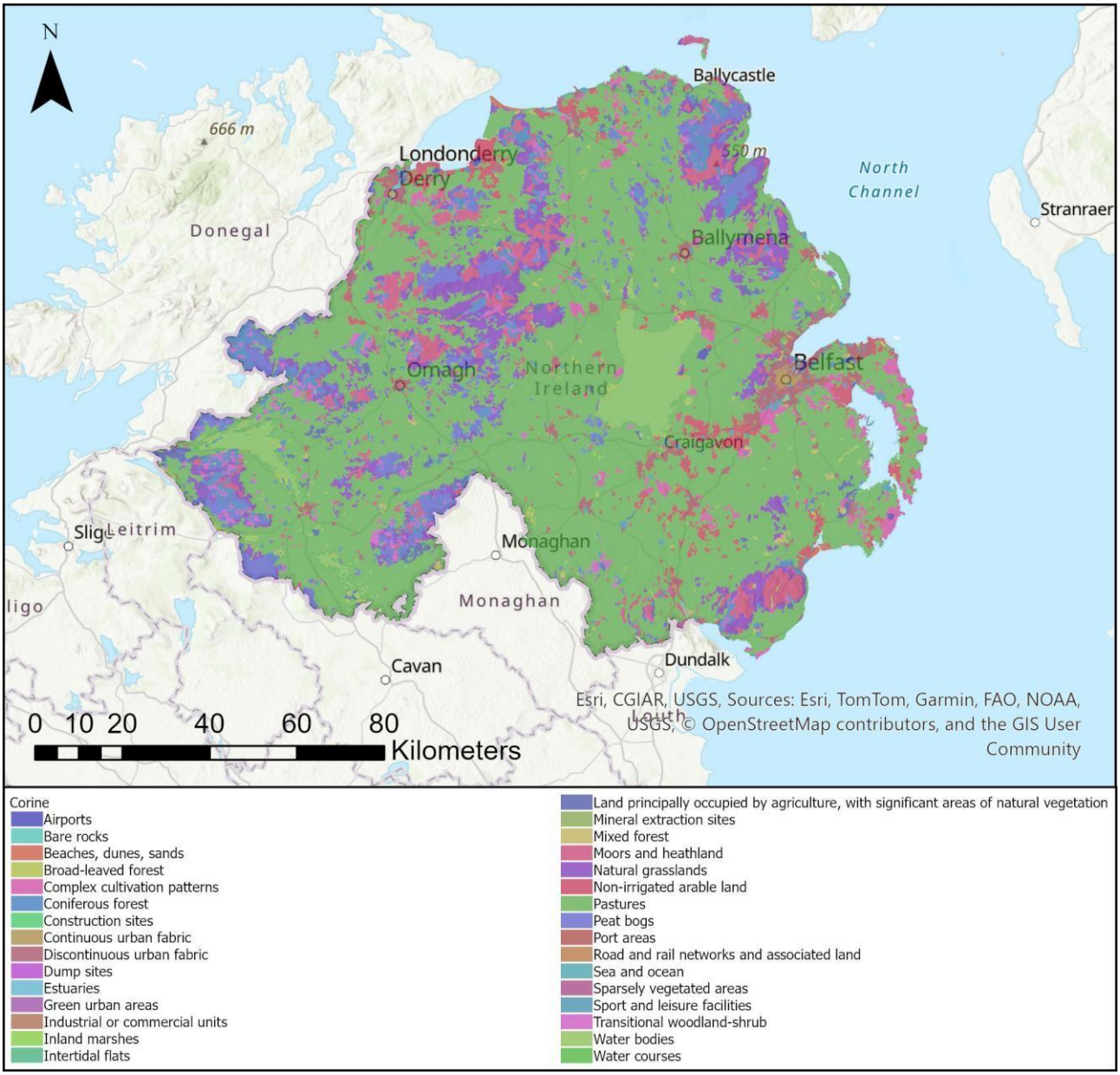

Figure 3-7: Corine land use mapping across Northern Ireland

Table 3-9: Dominant Land Cover Types within Northern Ireland (2018)

Land Cover Class	Total Land Cover (km^2)	% of Total
Pastures	9,074	64
Natural Grasslands	1046	7
Moors and Heathland	643	5
Peat Bogs	558	4
Water bodies	567	4

Land Cover Class	Total Land Cover (km^2)	% of Total
Coniferous Forest	472	3
Discontinuous urban fabric (Suburban)	412	3
Complex Cultivation Patterns	269	2
Non-Irrigated Arable Land	334	2
Land Principally Occupied by Agriculture, with significant areas of natural vegetation	166	1
Transitional woodland-scrub	218	2
Continuous urban fabric (Urban)	29	0.2
Mineral extraction sites	31	0.2

3.2.3.4 TB Persistence in Soils and Soil Contamination

Section 3.2.1.3.4 outlined that TB can persist within the environment for several months under certain environmental conditions and can persist in both alkaline and acidic conditions, however presently it remains unclear if soil type can specifically influence persistence (Allen et al., 2021).

As discussed in **Section 3.2.2.4**, there is potential for contamination to occur within soils if culled badger carcasses fail to be removed from an area. This may lead to the persistence and accumulation of TB within soils on a localised basis. Furthermore, the use of lead ammunition during culling activities may lead to localised contamination within soil and water sources, through either spent shot discarded within the environment or from shots remaining within carcasses, with the potential for lead accumulation to occur. Any potential effects will likely be localised in area, however, there may be potential for contamination to occur should interaction occur with areas of known aquifer importance as outlined in **Section 3.2.1.2**.

3.2.3.5 Summary of Existing Pressures and Issues for Geology, Soils and Land Use in Northern Ireland

Existing pressures and issues for geology across Northern Ireland relate to the presence of permeable sedimentary bedrock or where the occurrence of fracture flows results in highly productive aquifers, such as those in the north-east Antrim Hills and south-west Fermanagh Lakelands. Where these areas are overlain by freely draining soils, contaminants may be leached into groundwater or into nearby waterbodies and therefore may be transported considerable distances from its source. In general, the areas of highest groundwater vulnerability are those with bedrock outcrops present, or where glacial sand and gravels are present particularly in areas of higher elevation such as the Antrim Hills, Mourne Mountains and Sperrin Mountains. Approximately 77% of the total Northern Ireland land area (1.35 million hectares) is used for agriculture indicating the dominance of this industry and its economic importance.

Implementation of the Plan measures, including the potential Wildlife Intervention Options, are unlikely to affect Geology, Soils and Land Use at a national or regional level. There may be potential for localised effects e.g., highly localised soil disturbance associated with vehicles accessing areas for the introduction of Wildlife Intervention Options; highly localised contamination effects on soils from lead-shot or from TB from badger carcasses which fail to be removed.

3.2.4 Water

Water is essential for the maintenance of biodiversity, supports the population through the provision of drinking water and support of many activities such as tourism and recreation (NIEA, 2013). Although there have been improvements in drinking water quality and water utility discharge quality, and a decrease in incidents of water pollution, the most recent status of WFD surface water bodies in Northern Ireland highlights the continued issues in the achievement of a good or high ecological status and issues with persistent and legacy chemicals.

Water quality can be adversely affected through the addition of sediments and hazardous substances such as heavy metals. This may impact on the chemical condition of waterbodies and also lead to a loss of sensitive species and impact upon the ecological status of waterbodies. It is considered that the key issues associated with implementation of the Plan and the potential Wildlife Intervention Options comprise:

- Potential for localised effects on water quality due to contamination from badger carcasses and/or lead contamination;
- Potential for localised effects on the status of WFD Protected Areas, including for water-dependent habitats and species, economically significant aquatic species, drinking water, recreation and nutrient sensitive areas; and
- Potential for localised effects on groundwater quality, including the potential for microbial and chemical contamination of drinking water supplies.

3.2.4.1 WFD Surface Water Bodies and Protected Areas in Northern Ireland

3.2.4.1.1 WFD Status

The EU Water Framework Directive (WFD) (2000/60/EC), transposed in Northern Ireland through 'The Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017' the "WFD Regulations", established a new legal framework for the protection, improvement and sustainable use of rivers, lakes, transitional waters, coastal waters and groundwater across Europe. This was undertaken to prevent deterioration and to enhance the status of aquatic ecosystems, promote sustainable water use and reduce pollution. The WFD is implemented through River Basin Management Plans (RBMPs). Northern Ireland has three River Basin Districts (RBDs), the North-West (NWRBD), Neagh Bann (NBRBD) and North-East (NERBD). The Water (Amendment) (EU Exit) Regulations 2019 ensure that the WFD (as transposed) and the supporting pieces of water legislation continue to operate in Northern Ireland following the UK's exit from the EU; as the preparation and implementation of a RBMP is a key part of the implementation of the WFD Regulations, this process will continue within Northern Ireland.

The WFD Regulations require the production and implementation of a RBMP for Northern Ireland in six yearly cycles. The most recent is the third cycle RBMP, which runs from 2021-2027 (DAERA, 2025a). This classified the status of all WFD surface water bodies according to ecological and chemical parameters and set objectives and a programme of measures for the next six-year cycle to help improve water bodies classified as below 'good' status. This report highlights significant changes in the monitoring and overall classification for rivers, lakes and transitional and coastal water bodies. New priority substances were introduced into the monitoring programme in 2018, and the 'chemical status assessment' now includes the presence of ubiquitous, persistent, bioaccumulative, toxic (uPBT) substances and extrapolation of related failures meant that no surface water body could achieve better than moderate overall status.

WFD water bodies are monitored on a rolling programme within each river basin management planning cycle. 'Water Bodies' are the basic management units for reporting and assessing compliance with the environmental objectives of the WFD Regulations. There are 496 WFD surface water bodies in Northern Ireland, comprising 450 rivers, 21 lakes and 25 transitional and coastal waters. The latest classification results for surface water bodies are presented in the Northern Ireland Water Framework Directive Statistics Report 2024 (DAERA, 2025b), including ecological and chemical status.

Table 3-10 compares the number and percentage of water bodies within the NERBD, NBRBD and NWRBD at good or high status in 2018, 2021 and 2024. This indicates the following:

- River status – In 2018, 31% (141 rivers) of the 450 river water bodies monitored in Northern Ireland were classified as good or high ecological status. In 2021, 31% (140 rivers) achieved good of high

ecological status, and in 2024 29% (131 rivers) achieved good or high ecological status. In 2024, 17% of monitored rivers in the North East RBD, 22% in the Neagh Bann RBD and 44% in the North West RBD achieved good or high ecological status. Considering chemical status with the exclusion of uPBT and cypermethrin, 91% of river water bodies were classified as good status in 2018, 93% in 2021 and 92% in 2024. In 2024, 94% of monitored rivers in the North East RBD, 90% in the Neagh Bann RBD and 93% in the North West RBD achieved good or high chemical status.

- Transitional and Coastal status – In 2018, 2021 and 2024, 40% (10) of the 25 transitional and coastal water bodies monitored in Northern Ireland were classified as good ecological status. In 2024, 47% of monitored transitional and coastal water bodies in the North East RBD, 40% in the Neagh Bann RBD and none in the North West RBD achieved good ecological status. Considering chemical status with the exclusion of uPBT and cypermethrin, 44% of transitional and coastal water bodies were classified as good status in 2018, 88% in 2021 and 32% in 2024. In 2024, 35% of monitored transitional and coastal water bodies in the North East RBD, 40% in the Neagh Bann RBD and 0% in the North West RBD achieved good chemical status.
- Lake status – In 2018, 24% (5) of the 21 lake water bodies monitored in Northern Ireland were classified as good ecological status. In 2021, 14% (3 lakes) achieved good ecological status, and in 2024 24% (5 lakes) achieved good ecological status. In 2024, 33% (1) of monitored lakes in the North East RBD, 20% (2) in the Neagh Bann RBD and 25% (2) in the North West RBD achieved good or high ecological status. Considering chemical status with the exclusion of uPBT and cypermethrin, all lakes were classified as good chemical status in 2018, 2021 and 2024.

Comparison of ecological status shows little to no change in status from the previous reporting, and a decline in status for lake water bodies. Pressure assessments have identified that two significant pressure sources related to nutrients are continuing to prevent the achievement of good status for water bodies: agricultural activities and sewage-related problems (DAERA, 2025a).

Table 3-10: Comparison of WFD waterbodies at good or better ecological and chemical status (excluding uPBT and cypermethrin) for 2018, 2021 and 2024

Status	No. & % in NWRBD	No. & % in NBRBD	No. & % in NERBD	Total No. & % in NI
Rivers				
Ecological 2018	68 (42%)	56 (28%)	17 (19%)	141 (31%)
Ecological 2021	65 (40%)	55 (28%)	20 (22%)	140 (31%)
Ecological 2024	72 (44%)	44 (22%)	15 (17%)	131 (29%)
Chemical 2018	148 (91%)	178 (89%)	84 (94%)	410 (91%)
Chemical 2021	153 (94%)	180 (90%)	85 (96%)	418 (93%)
Chemical 2024	150 (93%)	179 (90%)	84 (94%)	413 (92%)
Lakes				
Ecological 2018	2 (25%)	2 (20%)	1 (33%)	5 (24%)
Ecological 2021	1 (13%)	1 (10%)	1 (33%)	3 (14%)
Ecological 2024	2 (25%)	2 (20%)	1 (33%)	5 (24%)
Chemical 2018	8 (100%)	10 (100%)	3 (100%)	21 (100%)

Status	No. & % in NWRBD	No. & % in NBRBD	No. & % in NERBD	Total No. & % in NI
Chemical 2021	8 (100%)	10 (100%)	3 (100%)	21 (100%)
Chemical 2024	8 (100%)	10 (100%)	3 (100%)	21 (100%)
Transitional and Coastal				
Ecological 2018	1 (33%)	2 (40%)	7 (41%)	10 (40%)
Ecological 2021	0	2 (40%)	8 (47%)	10 (40%)
Ecological 2024	0	2 (40%)	8 (47%)	10 (40%)
Chemical 2018	2 (67%)	2 (40%)	7 (41%)	11 (44%)
Chemical 2021	2 (67%)	5 (100%)	15 (88%)	22 (88%)
Chemical 2024	0	2 (40%)	6 (35%)	8 (32%)

There are 75 WFD groundwater bodies in Northern Ireland, comprised of 45 in the NWRBD, 14 in the NERBD and 16 in the NBRBD. Under the WFD, groundwater bodies are classified as 'good' or 'poor' status for quantitative and chemical status, and overall good status requires that both the quantitative and chemical status are good.

The status of groundwater bodies has not been updated mid-cycle, and the latest available groundwater body status is presented in the Northern Ireland Water Framework Directive Statistics Report (DAERA, 2021). **Table 3-11** compares the number and percentage of waterbodies within the NERBD, NBRBD and NWRBD at good status in 2015 and 2021. This indicates the following:

- Groundwater body status - In 2015, 65% of the 75 groundwater bodies monitored achieved good overall status, while in 2021 68% achieved good overall status. This comprised 43% of groundwater bodies in the NERBD, 38% in the NBRBD and 82% in the NWRBD achieving good overall status. In 2021, 95% of groundwater bodies achieved good quantitative status and 71% achieved good chemical status.

Table 3-11: Status of WFD groundwater bodies

Period	No. & % in NWRBD	No. & % in NBRBD	No. & % in NERBD	Total No. & % in NI
Quantitative Status				
2015	42 (93%)	13 (81%)	12 (86%)	67 (89%)
2021	43 (96%)	16 (100%)	12 (86%)	71 (95%)
Chemical Status				
2015	38 (84%)	7 (44%)	6 (43%)	51 (68%)
2021	38 (84%)	10 (63%)	5 (36%)	53 (71%)
Overall Status				
2015	37 (82%)	6 (38%)	6 (43%)	49 (65%)

Period	No. & % in NWRBD	No. & % in NBRBD	No. & % in NERBD	Total No. & % in NI
2021	36 (80%)	10 (63%)	5 (36%)	51 (51%)

3.2.4.2 WFD Register of Protected Areas

The WFD Regulations required the establishment of a register of protected areas for Northern Ireland, for water bodies, or parts thereof, that require additional water quality protection owing to their importance to people or wildlife. This is outlined in Article 10 of the WFD Regulations.

The register comprises the following protected areas:

a) A drinking water protected area (surface water and groundwater).

b) An area or body of water requiring special protection in accordance with any EU instrument protecting surface water, groundwater or conservation of habitats and species, including:

(i) Areas designated for the protection of economically significant aquatic species (including shellfish water protected areas).

(ii) Bodies of water designated as recreational waters (Bathing waters).

(iii) Nutrient-sensitive areas.

(iv) Areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection.

The WFD protected areas in Northern Ireland are summarised in **Table 3-12**.

Table 3-12: WFD Register of Protected Areas

WFD Protected Area Type		NERBD	NWRBD	NBRBD	Total Number
Drinking Water Protected Areas	Surface water	8	10	8	26
	Groundwater	10	42	13	65
Shellfish Water Protected Areas		7	2	1	10
Bathing Waters		27	3	3	33
Urban Waste Water Sensitive Areas		16	4	3	23
Water Dependent Protected Areas		28	26	24	74*
Groundwater dependent terrestrial ecosystems		2	5	2	9

*Note: some protected sites straddle more than one RBD, hence the NI total does not equal the sum of the RBDs.

Water-dependent protected areas in Northern Ireland are designated for the protection of habitats or species, where the maintenance or improvement of the status of water is an important factor in their protection. Northern Ireland has a total of 74 water-dependent European sites, which are designated under the Conservation (Natural

Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended). The most up to date assessment indicates that 20% of these sites are in unfavourable condition owing to pressures from the water environment.

GWDTEs are assessed for quantitative and chemical groundwater status. Northern Ireland has nine GWDTEs, with the most up to date assessment indicating that two are at poor status regarding the impact of groundwater quantity or quality on their condition – Magilligan and Rooskey Turlough.

Drinking water protected areas are waters used for the abstraction of drinking water intended for human consumption (or intended for future abstraction of water intended for human consumption), including surface waters and groundwaters; within the three RBDs of Northern Ireland, there are a total of 26 surface waters and 65 groundwaters included as WFD Protected Areas. The programme of measures for each RBD must aim to avoid the deterioration in water quality with an overall goal of reducing the level of purification required for the production of abstracted drinking water. Drinking water is regulation through a risk-based approach under the Water Supply (Water Quality) Regulations (Northern Ireland) 2017 and The Private Water Supplies Regulations (Northern Ireland) 2017. Further information on drinking waters is provided in **Section 3.2.2.4.1**.

Economically significant aquatic species protected areas are designed to protect aquatic species that are of economic importance, including designated shellfish waters; within the three RBDs of Northern Ireland, there are ten sites designated as WFD Protected Areas for shellfish. Further information on the shellfish water sites and updated status is provided in **Section 3.2.2.4.2**.

Bathing water protected areas are those identified under the Bathing Waters Directive (2006/7/EC); within the three RBDs of Northern Ireland, there are a total of 33 bathing waters included as WFD Protected Areas. Further information on the bathing waters and updated status is provided in **Section 3.2.2.4.3**.

Nutrient sensitive areas in Northern Ireland are those designated as sensitive under the Urban Waste Water Treatment Directive (UWWTD) (91/271/EEC) and the Nitrates Directive (91/676/EEC); within the three RBDs of Northern Ireland, there are a total of 23 Urban Waste Water Treatment Directive sensitive areas. These are areas where more stringent treatment is required to prevent surface water becoming eutrophic, to prevent exceedance of the nitrates drinking water standard, and to meet the requirements of other regulations, such as those for bathing waters. A review of sensitive areas is required by the UWWTD every four years. In the 2015 review, existing sensitive areas in the three RBDs were reviewed, and the Castletown catchment and Newry transitional waters were designated within the NBRBD. No individual areas have been designated as nutrient sensitive WFD Protected Areas under the Nitrates Directive, rather a total territory approach has been adopted for Northern Ireland.

3.2.4.2.1 Waterbody Contamination

As outlined in **Sections 3.2.2.4 and 3.2.3.4** there may be potential for localised contamination and effects on water quality to occur from the implementation of the culling activities should the use of lead ammunition and/or culled badger carcasses fail to be removed from an area.

3.2.4.3 Summary of Existing Pressures and Issues for Water in Northern Ireland

The most recent State of the environment report for Northern Ireland (NIEA, 2013) states that industry, power generation, agriculture and forestry, development, transport and infrastructure pressures all potentially impact on Northern Ireland's water environment. Under the WFD, pressures on the quality of the water environment have been assessed according to two types, as follows:

- Point source pollution pressures on water quality – e.g., effluent discharges arising from industry and wastewater treatment works (WWTWs); sewer overflows during heavy rainfall events; agricultural point sources from farm ditches and drains; and
- Diffuse source pollution pressures on water quality – e.g., contaminated surface run-off from roads, construction sites, fuel storage areas; septic tank discharges; acid and nutrient deposition from the air; run-off of pesticides, soils and nutrients from agriculture and forestry, and migration of these to groundwaters and surface waters.

Abstractions and impoundments of water for drinking water supply, industry, agriculture, recreation, and hydropower can lead to pressures on water quantity and flow and can exacerbate existing water quality issues. The introduction and spread of invasive non-native species, including aquatic plants such as floating pennywort and curly waterweed, can impact upon native aquatic biodiversity, and can adversely affect water-based recreational activities. The risk of flooding following heavy rainfall events can be increased by land management

practices that influence water storage potential and run-off, such as in urban areas where impermeable surfaces are common. Flood events can also lead to increased run-off of sediments and pollutants from agricultural lands, with consequences for receiving water quality, while land management practices can have a significant influence on flood risk in downstream areas.

Implementation of the Plan measures, including the potential Wildlife Intervention Options, are unlikely to affect Water at a national or regional level. There may be potential for localised effects e.g., highly localised contamination effects on waterbodies from lead-shot or from TB from badger carcasses which fail to be removed, however the likelihood of such occurrences is low.

3.2.5 Air

Good air quality is vital for human health and wellbeing, for our climate, habitats and built environment. Air pollution is the result of a range of substances that are introduced into the atmosphere from a variety of different sources. On the whole, air quality in Northern Ireland has improved significantly over the past few decades; in particular, concentrations of sulphur dioxide, originating from the combustion of coal and oil, has reduced. However, some pollutants are continuing to exceed air quality objectives. This has consequences on human health.

It is considered that the key issues associated with implementation of the Plan and the potential Wildlife Intervention Options and Air comprise:

- Potential for localised effects on air pollutant emissions arising from vehicle and gun emissions from the implementation of Wildlife Intervention options; and
- Potential for effects of noise on local populations and human health within intervention areas from the use of culling methods.

3.2.5.1 Air Quality in Northern Ireland

Air quality was monitored regularly at 23 stations within Northern Ireland during part or all of 2024. At each of these locations, levels of pollutants including Nitrogen dioxide (NO_2), Nitric oxide (NO), Nitrogen oxides as nitrogen dioxide (NO_X as NO_2), Ozone (O_3), PM_{10} particulate matter, $PM_{2.5}$ particulate matter, benzene, Sulphur dioxide (SO_2), polycyclic aromatic hydrocarbons and Carbon monoxide (CO) are monitored, and measured with regard to EU Air Quality Directives, the Air Quality Standards Regulations (Northern Ireland) 2010, the 2007 UK Air Quality Strategy (AQS) objectives, the Environment Order (NI) 2002 and the Air Quality Regulations (Northern Ireland) 2003. Data is available regarding the pollutants monitored at 19 of these sites, and the latest measured air quality is shown in **Table 3-13** as available on the Air Quality Northern Ireland website.

Table 3-13: Air pollution monitoring sites and pollutants measured in Northern Ireland

Monitoring Site	Pollutants monitored	Latest pollution level*
Derry Dale's Corner	NO_2, NO, NOX as NO_2	Low (NO_2)
Derry Rosemount	O_3, PM_{10}, $PM_{2.5}$, SO_2, NO_2, NO, NOX as NO_2	Low (NO_2, SO_2, O_3, PM_{10}, $PM_{2.5}$)
Ballymena Ballykeel	$PM_{2.5}$, PM_{10}, NO_2, SO_2, NOX as NO_2, NO	Low ($PM_{2.5}$, SO_2, $PM_{2.5}$, PM_{10})
Armagh Lonsdale Road	PM_{10}, NO_2, NOX as NO_2, NO	Low (NO_2,PM_{10})
Newry Canal Street	PM_{10}, NO_2, NOX as NO_2, NO	Low (NO_2, PM_{10})
Downpatrick Roadside	NO_2, NO, NOX as NO_2	No Data

Monitoring Site	Pollutants monitored	Latest pollution level*
Lisburn Dunmurry Seymour Hill	$PM_{2.5}$, PM_{10}, SO_2	Low (All)
Belfast Stockman's Lane	PM_{10}, NO_2, NOX as NO_2, NO	Low (NO_2, PM_{10})
Belfast Westlink Roden Street	NO_2, NOX as NO_2, NO	Low (NO_2)
Enniskillen Bowling Green	$PM_{2.5}$, PM_{10}	Low (All)
Castlederg	$PM_{2.5}$, PM_{10}	Low (All)
Belfast Centre	$PM_{2.5}$, PM_{10}, SO_2, NO_2, O_3, CO, NOX as NO_2, NO	Low ($PM_{2.5}$, PM_{10}, SO_2)
Belfast Newtownards Road	NO_2, NOX as NO_2, NO	Low (NO_2)
Castlereagh Dundonald	NO_2, NOX as NO_2, NO	Low (NO_2)
North Down Holywood A2	$PM_{2.5}$, PM_{10}, NO_2, NOX as NO_2, NO	Low (NO_2, PM_{10}, $PM_{2.5}$)
Newtownabbey Antrim Road	NO_2, NOX as NO_2, NO	Low (NO_2)
Ballymena Antrim Road	NO_2, NO, NOX as NO_2	Low (NO_2)
Strathfoyle Bawnmore Place	$PM_{2.5}$, PM_{10}	Low (All)
Newtownstewart	$PM_{2.5}$, PM_{10}	No Data
Lough Navar	$PM_{2.5}$, PM_{10}, O_3	Low (All)
Strabane Springhill Park	$PM_{2.5}$, PM_{10}, SO_2	No Data
Limavady Dungiven	$PM_{2.5}$, PM_{10}, NO_2, NO, NOX as NO_2,	Low ($PM_{2.5}$, PM_{10}, NO_2)

* https://www.airqualityni.co.uk/ Accessed 27 November 2025

Air quality in Northern Ireland is reported annually by DAERA and is compiled from data supplied by the monitoring stations; the most recent report is for 2024 (DAERA, 2025c). This highlights any exceedances of air quality objectives and highlights any emerging air quality trends. The most significant air pollutants for Northern Ireland and their sources are the following:

- Nitrogen oxides (NO_x, including nitric monoxide NO and nitrogen dioxide NO_2), arising from fuel combustion in transport and energy generation.
- Sulphur dioxide (SO_2), arising from combustion of fuels that contain sulphur, from power generation, industry and domestic solid fuel combustion.
- Particulate matter (PM_{10} and $PM_{2.5}$), arising from road transport and domestic solid fuel combustion, and as a secondary pollutant from ammonia.
- Ground-level ozone (O_3), arising from the interaction of various air pollutants with sunlight.

- Ammonia (NH_3), arising from agricultural activities and handling, storage and spreading of manure. NH_3 reacts with other pollutants (NO_x, S), producing fine particles of ammonium nitrate and ammonium sulphate.
- Polycyclic aromatic hydrocarbons (PAHs), arising from incomplete combustion primarily from domestic sources.

The following pollutants were monitored in Northern Ireland during 2024: carbon monoxide (CO), oxides of nitrogen (NO_x), comprising nitric oxide (NO) and nitrogen dioxide (NO_2), sulphur dioxide (SO_2), particulate matter (as PM_{10}, $PM_{2.5}$ and black carbon), ozone (O_3), benzene, polluting elements (including lead, arsenic, cadmium, nickel, and mercury), polycyclic aromatic hydrocarbons (PAHs) and toxic organic micro pollutants (TOMPs). The Regulations limit values, target values and AQS objectives were met for the following pollutants in Northern Ireland in 2024: PM_{10} and $PM_{2.5}$ particulate matter, NO_2, O_3, CO, benzene, SO_2 and polluting elements (lead; arsenic; cadmium; nickel). Three sites monitored for PAHs exceeded AQS annual mean objectives (0.25 ng m^3), however none of the four sites exceeded the Standards Regulations target value of 1 ng m^{-3}. The exceedance of PAHs standards has potential to decrease, however, as Northern Ireland's Energy Strategy - Path to Net Zero Energy (Northern Ireland Executive, 2021), details restrictions on burning fossil fuels for home heating.

Local Air Quality Management (LAQM) provides the framework under the Environment Order (NI) 2002 within which air quality is managed by Northern Ireland's local authorities (District Councils). LAQM requires the District Councils to review and assess a range of air pollutants against the objectives set by the AQS, using a range of monitoring, modelling, and other methods. For locations where objectives are not expected to be met by the relevant target date, District Councils are required to declare an Air Quality Management Area (AQMA), and to develop an Action Plan to address the problem. There are 18 active AQMAs in Northern Ireland, set for one or more of the pollutants PM_{10} or NO_2; the locations of these AQMAs are shown in **Figure 3-8**.

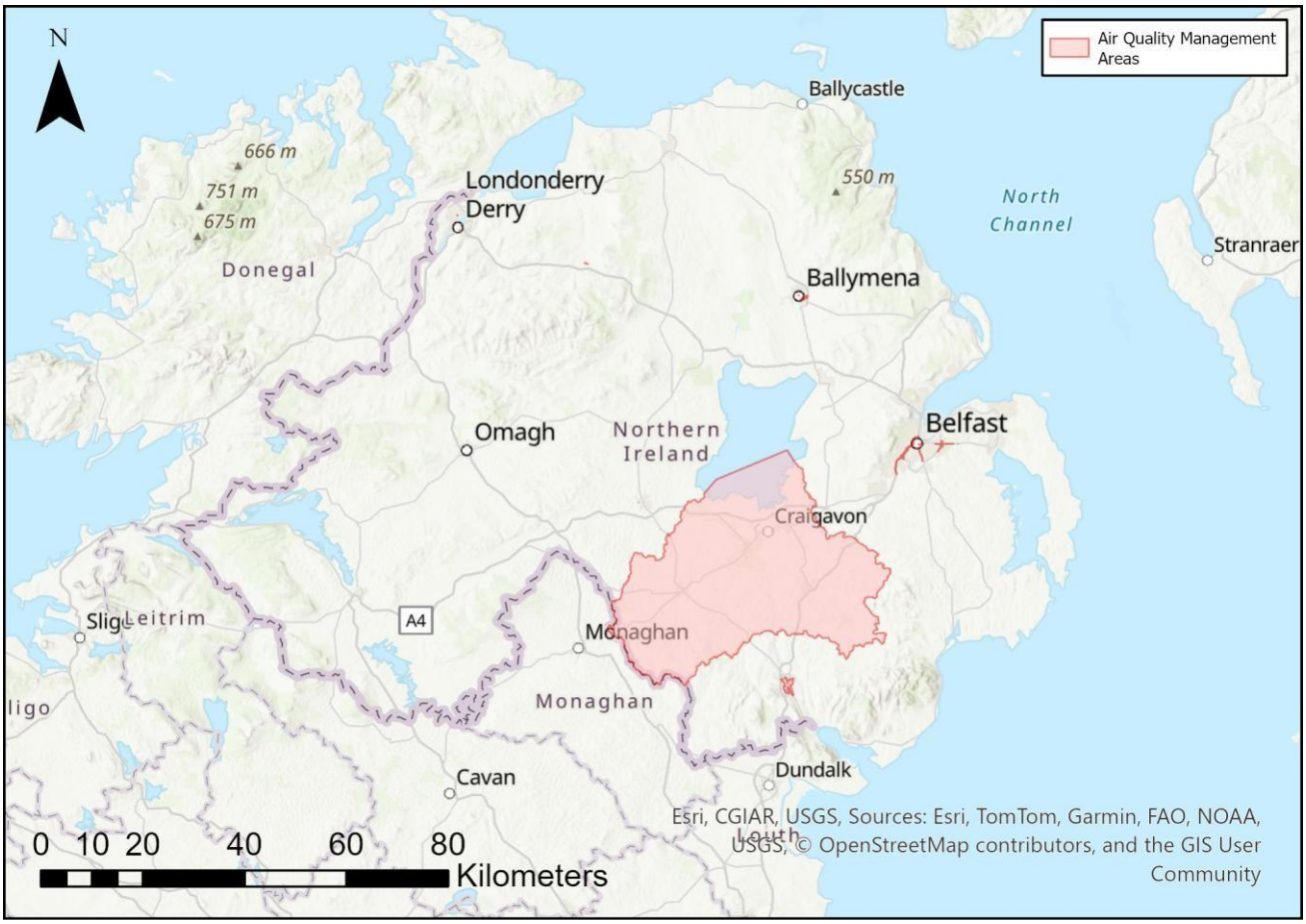

Figure 3-8: Air Quality Management Areas in Northern Ireland

The UK National Atmospheric Emission Inventory (NAEI) is the standard reference air emissions inventory for the UK, and includes emission estimates for England, Scotland, Wales and Northern Ireland for a wide range of

important pollutants including GHGs, regional pollutants leading to acid deposition and photochemical pollution, persistent organic pollutants (POPs) and other toxic pollutants such as heavy metals. The NAEI is compiled annually, when the latest set of data are added, and the full time series updated and reported internationally. The latest report was published in 2025 and covers the period 2005-2023 (Bennett et al., 2025). This summarises emissions in Northern Ireland for the eight priority air pollutants: NH_3, CO, NO_x, non-methane volatile organic compounds (NMVOCs), PM_{10}, $PM_{2.5}$, SO_2 and lead (Pb). The report also details information on PCDD/Fs, B[a]P, and Hg emissions. The report details that most pollutant emission levels were lower in 2023 (aside from NH_3) than they were in 2005. The implementation of the potential Wildlife Intervention Options is likely to result in the use of vehicles to access areas, which may result in localised temporary increases of emissions associated with vehicles. This primarily includes NO_x and $PM_{2.5}$. As noted by the latest NAEI report, there has been a steady decrease in emissions of both NO_x and $PM_{2.5}$ due to more stringent regulations surrounding vehicle exhaust emissions and an increase in the use of electric vehicles. The use of shooting as a culling method can result in the release of emissions such as CO, NH_3 and particulate matter, leading to localised temporary effects on air quality.

3.2.5.2 Effects of air pollutants on Human Health and implementation of the Potential Wildlife Intervention Options

Air pollution can pose a serious risk to human health, from lung irritation and inflammation to acute respiratory illness and exacerbation of heart and lung disease. The implementation of any Wildlife Intervention Option will result in the use of vehicles to access intervention areas and may result in very localised temporary increases of emissions associated with vehicles. This primarily includes NO_x and $PM_{2.5}$. As noted by the latest NAEI report, there has been a steady decrease in emissions of both NO_x and $PM_{2.5}$ due to more stringent regulations surrounding vehicle exhaust emissions and an increase in the use of electric vehicles. The use of shooting as a culling method can result in the release of emissions such as CO, NH_3 and particulate matter, leading to very localised, temporary effects on air quality.

3.2.5.3 Noise Pollution

Noise represents a sound that is unpleasant or that causes disturbance and can have implications for human health and quality of life as outlined in **Section 3.2.2.3**. Noise can be derived from various sources such as road traffic, transport infrastructure, air travel, wind turbines, industrial sites, and leisure and residential activities. Excessive noise is considered a form of air pollution.

3.2.5.3.1 Noise Legislation

The Environmental Noise Directive sets out the remit for assessing and managing noise, requiring member states to produce strategic noise maps at five-yearly intervals that determine the noise exposure of the population. Action plans must be developed from these strategic noise maps, which set out how noise levels will be reduced, where needed, and how to preserve environmental noise in areas that are deemed to be good. The requirements of this Directive are implemented in Northern Ireland through the Environmental Noise Regulations (Northern Ireland) 2006 as amended by the Environmental Noise (Amendment) Regulations (Northern Ireland) 2018.

DAERA has general policy responsibility for managing environmental noise. The Department of the Environment (now DAERA) published the Noise Policy Statement for Northern Ireland (NPSNI) (DoE, 2014), which outlined the underlying principles and aims in existing policy documents, legislation and guidance relating to noise. Through the management of environmental and neighbourhood noise, the NPSNI aims to avoid, mitigate, or minimise adverse impacts on human health and quality of life that may arise from noise. With respect to environmental noise, the statement outlines that the planning system has an important role in preventing and minimising the impact of noise. The Pollution Control and Local Government (NI) Order 1978, provides local councils with the power to regulate environmental pollution including noise.

Local councils have the power to serve Noise Abatement Notices under the remit of Articles 63 and 65 of the Clean Neighbourhood and Environment Act (NI) 2011, where noise is considered to be prejudicial to health or a statutory nuisance. There is no set criterium in this legislation for the level of noise that constitutes a statutory nuisance; as such consideration is given to the volume, duration and source of the noise in establishing this. Generally, rules relating to noise limit targets and permitted hours are outlined at a local council level; however, in general, noisy work should be avoided between the hours of 11 pm and 7 am. Noise limits for outdoor

equipment are provided by the Noise Emission in the Environment by Equipment for use Outdoors (Amendment) (Northern Ireland) Regulations 2025.

3.2.5.3.2 Potential Noise Generation resulting from implementation of Potential Wildlife Intervention Options

The implementation of the Wildlife Intervention Options has potential for disturbance with the use of culling. The use of firearms will generate noise pollution, which can be considered as three components: muzzle blast, projectile noise and the impact noise. The volume of noise generated is dependent on the type of firearm in use. The degree of impact from the generation of noise will likely depend on the distance between the noise generating source and the receiving receptors.

Given the predominant habitats of badgers in agricultural and rural areas, the generation of shooting noise will likely occur predominantly in rural areas. These areas have lower background noise sources, compared to urban areas, potentially amplifying the noise of any shooting. Populations living within these rural areas may have a lower tolerance to noise and an increased sensitivity to the potential for any effects. Furthermore, given the nocturnal nature of badgers, such activities will likely occur at night, increasing the potential for disturbances on local populations and potentially negative impacts on human health through disrupted sleep and/or stress.

The use of shooting within rural areas also has potential for disturbances on other species, as outlined in **Section 3.2.1.4,** which may lead to temporary displacement from habitats or to implications on behaviours such as feeding or reproduction if the disturbance occurs within critical time periods. Furthermore, there may be potential for disturbances to livestock species given the association of badgers with agricultural habitat areas, and this disturbance may lead to stress on animals such as sheep or cattle with potential welfare implications.

3.2.5.4 Summary of Existing Pressures and Issues for Air in Northern Ireland

According to Northern Ireland's most recent state of the environment review (2013), air pollution from domestic combustion and from road transport remain as challenges in the improvement of air quality for the protection of human health (NIEA, 2013), while pollutants can also lead to secondary effects on sensitive habitats. However, air quality has improved significantly over the past few decades, and the most recent air quality monitoring report shows that all pollutants, except for PAHs, met EU limit and target values and AQS objectives.

The Clean Air Strategy for Northern Ireland - Public Discussion Document, 2020 is the first step in the development of a Clean Air Strategy for Northern Ireland. It presents evidence and research on a range of ambient air pollutants and outline policy and legislation currently in place to control air pollution. The first Clean Air Strategy for the Republic of Ireland was published in 2023. It aims to: set appropriate targets and limits to ensure continuous improvements in air quality; ensure that clean air considerations are integrated into policy developments across Government; increase the evidence base regarding pollution sources and health impacts and increase awareness of the importance of clean air for health; enhance regulation and enforcement systems; and develop any additional targeted or specific policy measures in response to national or local air quality issues. The strategy for Northern Ireland, when published, should provide a similar high-level strategic framework to identify and promote integrated measures across government to reduce air pollution.

Implementation of the Plan measures, including the Wildlife Intervention Options, have the potential to affect air, including through very localised temporary increases in emissions from vehicle emissions or emissions from firearms; localised increases in noise pollution and associated disturbance of local populations and local wildlife and livestock species from activities associated with the potential Wildlife Intervention Options.

3.2.6 Climatic Factors

Climate change represents one of the most important threats to our environment, and to our economy, and projections indicate that hotter, drier summers and warmer, wetter, winters will occur over the next century because of climate change. The Paris agreement, signed in 2015, committed to strengthening the global response to the threats of climate change, by holding the global temperature rise to no more than 2°C and preferably below 1.5°C. Key to this agreement is the reduction of GHG emissions fast enough to achieve this temperature goal.

The recent European Green Deal 2019 aims to make significant advances in climate action, providing a more sustainable low-carbon economy for the EU. It plans to boost the efficient use of resources by moving to a clean

circular economy, and to restore biodiversity and cut pollution. The Deal has set a goal of net zero carbon emissions by 2050, and a 50-55% reduction in emissions by 2030. The UK Climate Change Act 2008 introduced a legally binding target for the reduction of GHG emissions in the UK by at least 80% below 1990 baseline levels by 2050. The target for the 2018-2022 period was a reduction in emissions by 37% by 2020 and, for the next period 2022-2025 to reduce emissions by 51%. The Act was amended in 2019 and now commits the UK to reducing emissions by 100% by 2050 from 1990 baseline levels (in line with the EU's 'net zero 2050 target'). The first climate change legislation was passed by the Northern Ireland Assembly in 2022; the Climate Change Act (Northern Ireland) 2022 sets out the legal framework for tackling climate change by reducing GHG emissions in Northern Ireland, with a net zero target by 2050 from baseline levels.

It is considered that the key issues associated with the implementation of the Plan and the potential Wildlife Intervention Options and Climatic Factors comprise:

- Potential for localised release of GHG pollutants from Wildlife Intervention options.

3.2.6.1 Northern Ireland's Climate

Northern Ireland has a moderate climate, due to the effects of the Atlantic Ocean, with relatively mild winters and cool summers. There are localised differences in temperature, cloud and precipitation across the region, introduced by the indented shape of the coastline and the presence of high ground. The mean annual temperature at low altitudes in Northern Ireland varies from about 8.5°C to 10.0°C, with the higher values occurring around or near to the coasts. January and February are usually the coldest months, and July the warmest. Rainfall varies widely across Northern Ireland, with the wettest places being in the Sperrin, Antrim and Mourne Mountains, and the highest areas having average annual totals of about 1600mm. Higher averages occur in the more western counties of Fermanagh, Derry / Londonderry and Tyrone, while the driest places occur further east around Strangford Lough and close to the east coast, and near to the southern and eastern shores of Lough Neagh - where the annual totals are less than 800mm (Met Office, 2025).

3.2.6.2 Culling Activities and Emissions

The implementation of the potential Wildlife Intervention options may lead to the release of very localised emissions of GHG as all approaches will require the use of vehicles to intervention areas. For example, the implementation of culling via trapping, TVR or vaccination only will require the use of vehicles towing trailers to sites to install traps, particularly where the movement of heavy cage traps is required. The use of vehicles will also be required to transport carcasses from culling and TVR options and where vaccination is used, the use of on-board fridges will be required for storage of vaccinations. Vehicle exhausts primarily emit carbon dioxide, nitrogen oxides, particulate matter and carbon monoxide.

The use of shooting activities to implement culling under the Wildlife Intervention Options has the potential to lead to very localised emissions of greenhouse cases from gun firing releasing carbon monoxide, particulate matter, carbon dioxide, ammonia, polycyclic aromatic hydrocarbons and methane (Aurell et al., 2025), however the emissions are expected to be insignificant in quantity.

The implementation of the potential Wildlife Intervention options in combination with cattle intervention measures will help to reduce the incidence and spread of bTB leading to fewer herd incidences and cattle slaughtered. The premature slaughtering of cattle (as an agricultural asset) prior to reaching their full market potential represents an inefficiency in GHG inputs and outputs associated with cattle livestock production. Therefore, reducing bTB incidences will help to improve GHG emissions associated with the livestock sector indirectly.

3.2.6.3 Summary of Existing Pressures and Issues for Climatic Factors in Northern Ireland

Climate change represents a significant challenge internationally. GHG emissions in Northern Ireland have decreased by 31% since 1990, owing to improvements in energy efficiency, switching from coal to natural gas as a fuel source, and improvements in the management of landfills. The agriculture, transport and other change sectors have higher emissions of GHGs currently than they had in 1990. The UK has committed to a target of a 37% reduction in GHGs by 2020 and, through the Climate Change Act (Northern Ireland) 2022, Northern Ireland has committed to a target of 100% reduction by 2050; although in 2020 the UK as a whole had a 49.9% reduction, in Northern Ireland GHG reduction stood at only 23.9%. This has implications for successfully contributing to the UK and Northern Ireland targets for 'net zero emissions' by 2050.

Implementation of the Plan measures, including the potential Wildlife Intervention Options, have the potential to affect Climatic Factors at a very localised level, with any potential increases in GHG emissions confined to localised areas.

3.2.7 Material Assets

The term 'Material Assets' can be considered very broadly within the SEA process, encompassing for example infrastructure, settlements, transport and utilities.

In recognition of the importance of bTB on agriculture and its financial implications, consideration of material assets in the following section predominantly focusses on the number and types of agricultural assets found in Northern Ireland and information on cattle herds within Northern Ireland, as it is considered that the most potential for positive or negative effects on material assets from implementation of the Plan and the potential Wildlife Intervention Options relates to these.

It is considered that the key issues associated with implementation of the Plan and the potential Wildlife Intervention Options and Material Assets comprise:

- Potential for effects on the productivity of agricultural farm holdings with fewer bTB herd breakdowns;
- Potential for increased agricultural output and farm incomes per hectare with fewer bTB herd breakdowns;
- Potential for increased financial expenditure by farmers to comply with biosecurity requirements; and
- Potential for financial implications from amendments to compensation regarding bTB slaughtered cattle.

3.2.7.1 Agricultural Land Holdings in Northern Ireland

3.2.7.1.1 Number and types of Farms in Northern Ireland

Agriculture is very important to Northern Ireland's economy, accounting for approximately 1.9% of Gross Value Added (GVA) and supporting 1.4% of civil employment in 2024 (NISRA, 2024a); making the sector proportionally around three times as important to the local economy than it was for the UK as a whole.

There was a total of 26,190 farms in Northern Ireland in 2024, covering an area of 1,040,392 hectares (this refers to all active farm businesses having at least a hectare of farmed land (NISRA, 2024b)). Although this is an increase of 59 in the total number of farms from the previous year, the number of farms has shown a continuous downward trend from a total of 40,724 in 1981, decreasing by 10% in the 15-year period between 2004 and 2019. The area of land farmed, however, has remained relatively stable since 1981. Four fifths of Northern Ireland farms were classed as very small in 2024 (20,779).

The proportion of the various farm types in Northern Ireland are outlined in **Table 3-14**. Cattle and sheep represent the predominant farm type, with 77% of farms keeping some cattle, and 38% keeping some sheep. This is similar to figures reported for 2023; total numbers of sheep and cattle were consistent, however the number of beef cows decreased by 1%. There were also 4% of farms keeping some poultry and 1.5% having some pigs.

Table 3-14: Farm Business Types in Northern Ireland, 2024

Farm Type	% Farms
Cattle and sheep	79
Dairy	10
Cereals / General Cropping / Horticulture	7
Pigs / Poultry	3
Mixed / Other	2

3.2.7.1.2 Productivity of Northern Ireland Farms

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

There was a total of 51,213 farm workers in Northern Ireland in 2024, 79.3% of which were farmers, partners, directors, or spouses, and the remaining 20.7% other farm workers. This compares to a total workforce of 67,786 in 1981, comprising 76% famers or spouses and 24% other farm workers. This represents a decrease of approximately 24.5% in the total farm workforce between 1981 and 2024, however the breakdown of total farm workers between farmers, directors, partners or spouses and all other farm workers (approximately 79% to 21%) has remained relatively stable since 2004.

The total income attained from farming includes the return to farmers, partners, directors, spouses, etc. for labour, management input and personal capital invested; this increased by 62.5% (56.2% in real terms) from £341 million in 2023 to £766 million in 2024 and is now 71.7% above the average of the last 20 years, after counting for inflation (NISRA, 2024a). This increase has been attributed to higher product prices for most sectors in 2024.

The gross output from farming in 2024 was estimated at £3.19 billion, an increase of 7.5% from 2023. The proportional contribution of sectors to outputs in 2024 are shown in **Table 3-15**. There were increases in the output of the milk, cattle and calves, sheep and lamb, potato and horticultural sectors, but these were partially offset by decreases in output from the pig, poultry and cereal sectors. Milk was the highest valued output, at approximately £1.08 billion with an increase of 21.3% compared to 2023. The annual average dairy cow population in 2024 was 2.8% higher than 2023, at 329,428 head, and the average gross milk yield per cow increased by 0.9%. There was a 16.9% increase in the average gross milk price for 2024. The overall value of output of cattle and calves increased by 14.1% from 2023 to £658 million.

Table 3-15: Gross output of Northern Ireland agriculture, 2024

Output Type	% of Total
Dairy	17.1
Cattle	15.9
Sheep and wool	7.0
Poultry and eggs	13.2
Pigs	16.0
Cereals and other crops	1.0
Potatoes	2.3
Horticulture	1.9
Others	4.7

The gross input to farming in 2024 was estimated at £2.09 billion, a decrease of 2.6% from the previous year. The proportional contribution of inputs in 2024 are shown in **Table 3-16**. The total value of feed consumed in 2024 was £1.18 billion, accounting for 57% of the total expenses. This was an overall 4.4% decrease in cost from the previous year; the average price of feedstuffs increased by 11.6%, while the total purchased volume decreased by 7.5%.

Total machinery expenses decreased by 1.2% to £199 million in 2024. This decrease was mainly due to a 7.8% decrease in the cost of fuel and oils. Agricultural contracting costs remained unchanged at £118 million in 2024, whereas total fertiliser and lime costs decreased by 9.7% to £101 million in 2024.

Changes in the volumes of inputs and outputs combined to give a 1.2% improvement in the total factor productivity (TFP), a measure of the productivity of all resources within the sector. The single factorial terms of trade, a measure of the economic welfare of farmers, also increased by 23.4% from 2023.

Table 3-16: Total expenses of Northern Ireland agriculture, 2024

Input Type	% of Total
Feedstuffs	43.2
Capital consumption	15.0
Machinery	7.3
Labour	3.2
Fertilisers and lime	3.7
Net rent	2.2
Interest	3.0
Other expenses	22.4

3.2.7.2 Cattle Livestock Numbers within Northern Ireland

Cattle livestock comprise a large proportion of the Northern Ireland farming landscape. Total cattle numbers remained stable between 2023 and 2024, with approximately at a total of 1,673,236 animals, across cattle and calves within Northern Ireland. Presently there are 325,325 dairy cows, an increase of 2% since 2023, beef cows are lower at 266,000 a decrease of 4% compared to 2023 (NISRA, 2024b). Over two thirds of cattle are in herds of 100 or more animals.

3.2.7.3 bTB Incidences within Northern Ireland

As discussed in **Section 2.1**, bTB is an infectious disease resulting from *M. bovis*, predominantly affecting the respiratory system of cattle, with symptoms such as coughing, general poor health and weight loss. However, in some infected cattle, the disease progresses slowly, while some cattle may develop a “latent” infection, whereby it does not progress to the point of causing clinical disease (DAERA, 2025d). Transmission occurs through infectious droplets and can be shared to calves via infected colostrum or milk. Indirect contact such as contaminated feed or water can also spread bTB.

3.2.7.3.1 Bovine Tuberculosis (TB) Control Programme

As discussed in **Section 2.2**, in order to ensure that trading of Northern Ireland’s cattle products can continue there has been a programme for the eradication of bTB in place since the 1950s. Several measures are required farmers under this programme, with associated financial outlays.

<u>Annual Testing</u>

All cattle herds within Northern Ireland must be tested annually using the Comparative Intradermal Tuberculin Test (CITT) undertaken by a DAERA approved Veterinary Surgeon. At all times, all herds within Northern Ireland are allocated an official tuberculosis (OT) herd status, a herd status reason and a next test type. The herd status can be three options:

- Officially tuberculosis free status (OTF),
- Officially tuberculosis free status suspended (OTS), or
- Officially tuberculosis free status withdrawn (OTW).

Any cattle which are bTB reactors are removed for immediate slaughter. Should a herd fail to be annually tested, the OTF status is immediately suspended (OTS), and any delays to the testing of a herd will lead to the restriction of herd movements and downgrading of herd status to OTW. The status of OTW is also applied whenever a

bTB infection is disclosed. Where bTB herd outbreaks do occur, further testing of herds nearby or those deemed at-risk may also be required. All cattle slaughtered for human consumption are required to undergo a post mortem examination for the presence of bTB lesions. If a non-negative/inconclusive result occurs at the second CITT, the animal will be removed as a reactor.

Slaughter Requirements

Any cattle which are bTB reactors are removed for immediate slaughter by DAERA subcontracted hauliers. This process may involve removing individual animals from the farm, or, in cases where the number of animals infected is so high, implementing a complete herd depopulation as a necessary measure to control the spread of disease. A total herd depopulation event represents a significant loss of animals for farmers, and several restrictions are then placed upon the farm with associated labour and financial costs to farmers:

- 60 days after depopulation occurs, no animals may move onto the premises. A no stock restricted herd test must be completed to allow the movement restriction to be amended to facilitate the purchase of cattle.
- The premises must be fully cleaned and disinfected after depopulation and must be inspected by a DAERA Veterinary Officer and passed as satisfactory.
- Any existing slurry on the premises may contain bTB, therefore the herd keeper is advised on the control of risk from this source.
- Once restocking occurs, within two months a TB test is required. Should this test occur within a year of the original bTB breakdown, it is classed as a second restricted herd test (RH2). Should this test (RH2) be clear from bTB, the restrictions on the herd are removed. A post restriction test is required within six months, followed by the annual herd tests every twelve months, assuming a clear post restriction test.
- Should the premises be depopulated for more than twelve months, the restrictions are removed and tests following the purchase of cattle are classed as an annual herd test.

Movement Restrictions

All calves born after 1 January 1998 require identification using an ear tag within each ear within 20 days of birth. The identification numbers are authorised by DAERA and are recorded on the Northern Ireland Food Animal Information System (NIFAIS). All cattle movements are controlled by the herd bTB status, as all movements must be recorded on NIFAIS, including those to market and abattoir. Immediate movement control is applied should bTB be detected. Farmers are required to notify DAERA within seven days of the movement of cattle either arriving at, or leaving, a farm since 2000. Livestock markets are required to notify movements to DAERA by the end of the next working day. Where bTB restricted cattle are to be moved, a movement license from DAERA must be granted in advance.

Should an annual test fail to be completed in time, for herds of non-breakdown, movement controls are applied. When it is immediately overdue, no live moves to market, for export or other holdings can occur, and where it is one month overdue, no live moves to market, for export, other holdings or slaughter can occur and no cattle can be moved in aside from one breeding bull on an exceptional licence.

The Bovine Tuberculosis Control Scheme (NI) 2024

This scheme was introduced from 1 January 2024, under which a subsidised service is provided for the costs involved with health checks, tests and other screening measures required for bTB. The scheme aims to prevent and eradicate TB and to provide compensation to farmers whose livestock are slaughtered under DAERA's TB prevention and eradication control programme. Presently, compensation is limited to 100% of the market value for animals slaughtered as a result of bTB, with market value established on the basis of the value of the animal immediately before any suspicion or confirmation of bTB. This scheme is currently open to all farms within Northern Ireland which are active in the primary production of agricultural products (under Article 1 of Commission Regulation (EU) 2022/2472, which declares certain categories of aid in the agricultural and forestry sectors and in rural areas).

3.2.7.3.2 Herd Breakdowns

There were 3,081 herds affected by bTB in Northern Ireland in 2025 compared to 3,270 in 2024. Presently information on monthly statistics of bTB are recorded by DAERA and made available online (DAERA, 2025e). These herd instances are also recorded on an area basis for northern (Ballymena, Coleraine, Mallusk,

Londonderry and Omagh) and southern (Armagh, Dungannon, Enniskillen, Newry and Newtownards) regions. Since 2014, there has been a general increasing trend in the annual bTB herd incidence rate from 6% in 2014 to over 10% from 2022 onwards.

The annual herd incidence rate of bTB in Northern Ireland from September 2024 to September 2025 was 10.66%, an increase of 10.21% from the previous period. There were 18,892 reactor animals confirmed for the whole of 2025 in Northern Ireland. Since the start of 2026, there have been 6,562 bTB reactor animals detected within Northern Ireland. The latest available statistics on bTB cover the period up to March 2026 (DAERA, 2025e), with 1,764,087 animals tested within the latest 12-month period, with these outbreaks primarily in the southern region of Newtownards. The lowest outbreak region was Mallusk at under 8%, likely due to the predominantly urbanised landscape of this area reducing farming density and herd numbers.

Introduction of both cattle measures under the Plan and the Wildlife Intervention Options has the potential to lead to fewer bTB outbreaks and to improve farm productivity as well as to reduce the costs associated with implications of a bTB breakdown. However, there is uncertainty regarding the timescales involved with achieving bTB free status and when positive impacts would be delivered for farmers.

3.2.7.3.3 Costs

The presence of bTB within cattle leads to significant costs for farmers, in terms of testing, the need to cull infected animals and the need for full cleaning and disinfection of premises. Furthermore, the implementation of quarantine measures and restrictions on cattle/herd movements presents further economic challenges for affected farms. The Bovine Tuberculosis Control Scheme (NI) 2024 provides subsidies towards testing requirements and for the compensation for the market value of any cattle slaughtered due to bTB, which is presently limited to 100% of market value of the slaughtered animal. During 2024, there was a 13.6% increase in animal disease compensation payments to farmers compared to 2023, comprising a total of £41.8 million (NISRA, 2024a)

It has been projected that spending on bTB compensation payments by DAERA during the 2025/2026 financial year will reach over £56 million, due partly to the increasing market value of cattle as well as the increase in the number of reactor animals (O'Brien, 2025). The implementation of the Plan regarding Finance and Funding measures aims to reduce the compensation amount paid for bTB slaughtered livestock given the unsustainable nature of this payment for continued government financing. However, this measure remains under review but may have negative financial implications for farmers. The Plan also outlines additional cattle intervention strategies regarding testing and biosecurity, which may present additional costs for compliance should these not be considered under the Bovine Tuberculosis Control Scheme (NI) 2024.

3.2.7.4 Summary of Existing Pressures and Issues for Material Assets in Northern Ireland

The value of inputs and outputs to farming in Northern Ireland is dependent on economic fluctuations at a national and international level. The value of increased outputs can be offset by lower market prices, likewise, a decrease in the volume of inputs required, such as feedstuff, can be offset by price increases in these products. Cattle represent an important agricultural asset within Northern Ireland and are presently negatively impacted by bTB outbreaks due to both culling and the restrictions placed upon affected farms.

Implementation of the Plan measures, including the Wildlife Intervention Options, have the potential to lead to positive and negative effects on agricultural productivity and cattle health. There is also potential for effects on the economics of farm holdings in Northern Ireland from application of these measures, and value of the sector.

3.2.8 Cultural, Architectural and Archaeological Heritage

Cultural heritage, including archaeological heritage and architectural heritage, are places and objects of beauty, cultural, historic, scientific, social or spiritual value. They include archaeological monuments, World Heritage Sites (WHS), protected structures, designed landscapes, place names, language and inherited traditions. Northern Ireland is rich in cultural, archaeological and architectural heritage, with many important archaeological sites, monuments and heritage buildings. It is considered that the key issues associated with the implementation of the Plan and the potential Wildlife Intervention Options and Cultural, Architectural and Archaeological Heritage comprise:

- Potential for localised disturbance or disruption to assets or areas of importance for cultural, architectural and archaeological heritage.

3.2.8.1 Heritage Assets

There are 56,344 recorded heritage assets within Northern Ireland that have been included in the Historic Environment Record of Northern Ireland (HERoNI). This includes:

- 18,450 entries on the Sites and Monuments Record.
- 15,763 recorded historic buildings.
- 15,765 Industrial Heritage Record sites.
- 4,595 Defence Heritage Record sites.
- 324 Battlefield sites.
- 663 Historic Parks and Gardens Record sites.
- 384 identified aircraft wrecks and shipwrecks.
- 400 Historic Nucleated Urban Settlements (including those with identified areas of archaeological potential).

There are also over 12,000 designated heritage assets in Northern Ireland. This includes:

- 190 Monuments in State Care.
- 2,053 Scheduled Historic Monuments.
- 12 protected wrecks (3 shipwrecks which are scheduled under the Historic Monuments and Archaeological Objects Order (Northern Ireland) 1995 (HMS Drake, Lochgarry and Devereux), 1 Shipwreck (La Girona) which is protected under the Protection of Wrecks Act 1973 and 8 military aircraft protected under the Protection of Military Remains Act 1986).
- 9,124 Listed Buildings (Listed Buildings are those designated through listing as being of 'special architectural or historic interest' under Section 80 of the Planning Act (NI) 2011).
- 60 Conservation Areas.

Historic Parks, Gardens and Demesnes form part of the HERoNI, and are identified on the basis of these records for protection in the Local Development Plan (LDP) process; there are 383 of these sites included in the HERoNI. Local Landscape Policy Areas (547 no.), Areas of Significant Archaeological Interest (12 no., representing distinctive areas of the historic landscape in Northern Ireland), and Areas of Townscape / Village Character (177 no.) are LDP designations which may include assets recorded by HERoNI (DoC, 2020). There are also two UNESCO WHS in Northern Ireland. The Giant's Causeway is designated for its unique geological heritage. Gracehill, a Moravian Church Settlement, is Northern Ireland's first cultural heritage WHS. There are 49 scheduled monuments and 1,111 historic buildings and structures also included on the Heritage at Risk Northern Ireland (HARNI) Register. It is important to note that The HERoNI archive is still growing, with new assets added as new information is provided.

Other aspects of the historic environment include historic hedgerows and boundaries, including townland boundaries, and fishponds and historic routeways. Vernacular buildings, including homesteads and agricultural buildings, are particular and unique across Northern Ireland's landscapes. Some heritage assets, such as historic railways, canals, bridges and ancient earthworks are shared across the border with the Republic of Ireland, while others have shared landscape character.

The marine historic environment is located within Northern Ireland's inshore and coastal waters and includes heritage assets such as wrecks, submerged prehistoric landscapes and palaeoenvironmental deposits as noted within the HERoNI archive.

3.2.8.2 Summary of Existing Pressures and Issues for Cultural Heritage in Northern Ireland

According to the most recent State of the Environment report for Northern Ireland (NIEA, 2013), the archaeological resource is at risk from agricultural land use practices, and from urban development. While

archaeology and built heritage in urban areas tends to be most susceptible to impacts associated with development, resources in rural areas are susceptible to impacts associated with agriculture, particularly through cultivation, but also through stock density and machinery use. The erection of large structures and associated infrastructure on farmlands that are exempt from planning requirements can have both direct and indirect impacts on archaeological sites and other heritage assets. Built heritage in Northern Ireland has been adversely affected by population growth and expansion of the agricultural sector since the 18th century, with major landscape changes such as marginal land reclamation and removal of peatland occurring since the UK joined the EU in the 1970s. Heritage assets have specific vulnerabilities to climate changes, which are dependent on their make-up and location.

Environmental protection policies since the 1980s have brought protection to known archaeological sites and have incentivised good management practices; however, protected and unprotected sites are considered to remain at risk from arable practices and urban development. Considering the high proportion of land in Northern Ireland that is in agricultural use, the majority of archaeological and heritage features are found on farmland. The Condition and Management Survey of the Archaeological Resource (CAMSAR) Report (Gormley et al., 2009), recognised prehistoric monuments present within arable and improved grassland as being the most vulnerable. Post medieval vernacular heritage is also considered to be at risk from some practices and development.

Implementation of the Plan measures, including the potential Wildlife Intervention Options may have the potential to affect Cultural, Architectural and Archaeological Heritage assets at a localised level e.g., through highly localised disturbance or disruption to assets or areas of importance for cultural, architectural and archaeological heritage.

3.2.9 Landscape and Visual

‘Landscape’ is defined by the European Landscape Convention as ‘‘an area as perceived by people whose character is the result of the action and interaction of natural and/or human factors’ and ‘it concerns landscapes that might be considered outstanding as well as every day or degraded landscapes’. It aims to promote landscape protection, management and planning, and to organise European co-operation on landscape issues. The UK ratified the Convention in 2006, and it came into effect in 2007. Signatories to the Convention are required to draw up specific and/or sectoral landscape strategies, linked by landscape quality objectives.

The current landscape of Northern Ireland is a product of land use changes and human interventions that have taken place in the *c*. 9,000 years since the area was first settled. Although population growth in the late 20th and early 21st centuries expanded the extent of built-up areas, the Northern Ireland landscape remains predominantly rural, with agriculture the most prevailing land use (NIEA, 2013). It is considered that the key issues associated with the implementation of the Plan and the potential Wildlife Intervention Options and Landscape and Visual Amenity comprise:

- Potential for localised disturbance or disruption with areas of significance for landscape or visual amenity.

3.2.9.1 Designated Landscapes

The value of the landscape present in Northern Ireland is recognised through the designation of eight Areas of Outstanding Natural Beauty (AONB), designated for their distinctive landscape character and high scenic value, as follows:

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

- Sperrin AONB

These areas cover approximately 325,000 hectares, or *c.*20% of the total land area of Northern Ireland.

The Giant's Causeway UNESCO WHS is designated for its unique geological heritage. The Cuilcagh Lakelands UNESCO Global Geopark, formerly Marble Arch Caves UNESCO Global Geopark, is a transnational geopark that straddles the border between Fermanagh in Northern Ireland and Cavan in the Republic of Ireland, while the Mourne, Gullion, Strangford UNESCO Global Geopark is situated along the south-east border of Northern Ireland; these Geoparks are areas of internationally important rocks and landscapes, all of which must be managed responsibly for conservation, education, and sustainable development. The location of AONBs, WHS and Global Geoparks within the study area is shown in **Figure 3-9**.

Country Parks have been established in recognition of landscapes and public amenity; many of these Country Parks are managed by NIEA, including Castle Archdale, Crawfordsburn, Ness, Peatlands Park, Redburn, Roe Valley and Scrabo, while other parks such as Cave Hill, Carnfunnock, Delamont and Castlewellan are run by local councils. There are also sites managed by the National Trust as historic and natural attractions across Northern Ireland, including Causeway Coast, Rathlin Island, Mount Stewart, Castle Ward, Minnowburn, Slieve Donard and Castle Coole. In addition, the Northern Ireland Landscape Character Assessment 2000, described below, identified special landscapes that it termed Areas of Scenic Quality; some of these areas have been included in Local Area Plans, where they may be designated as Areas of High Scenic Value (AoHSV).

'Shared Horizons' (EHS, 2003) is DAERA's Statement of Policy on Protected Landscapes. This Statement sets out the issues associated with the protection and sustainable use of Northern Ireland's finest landscapes, usually recognised by some form of designation that sets them apart from the wider countryside and indicates the way in which DAERA plans to address them.

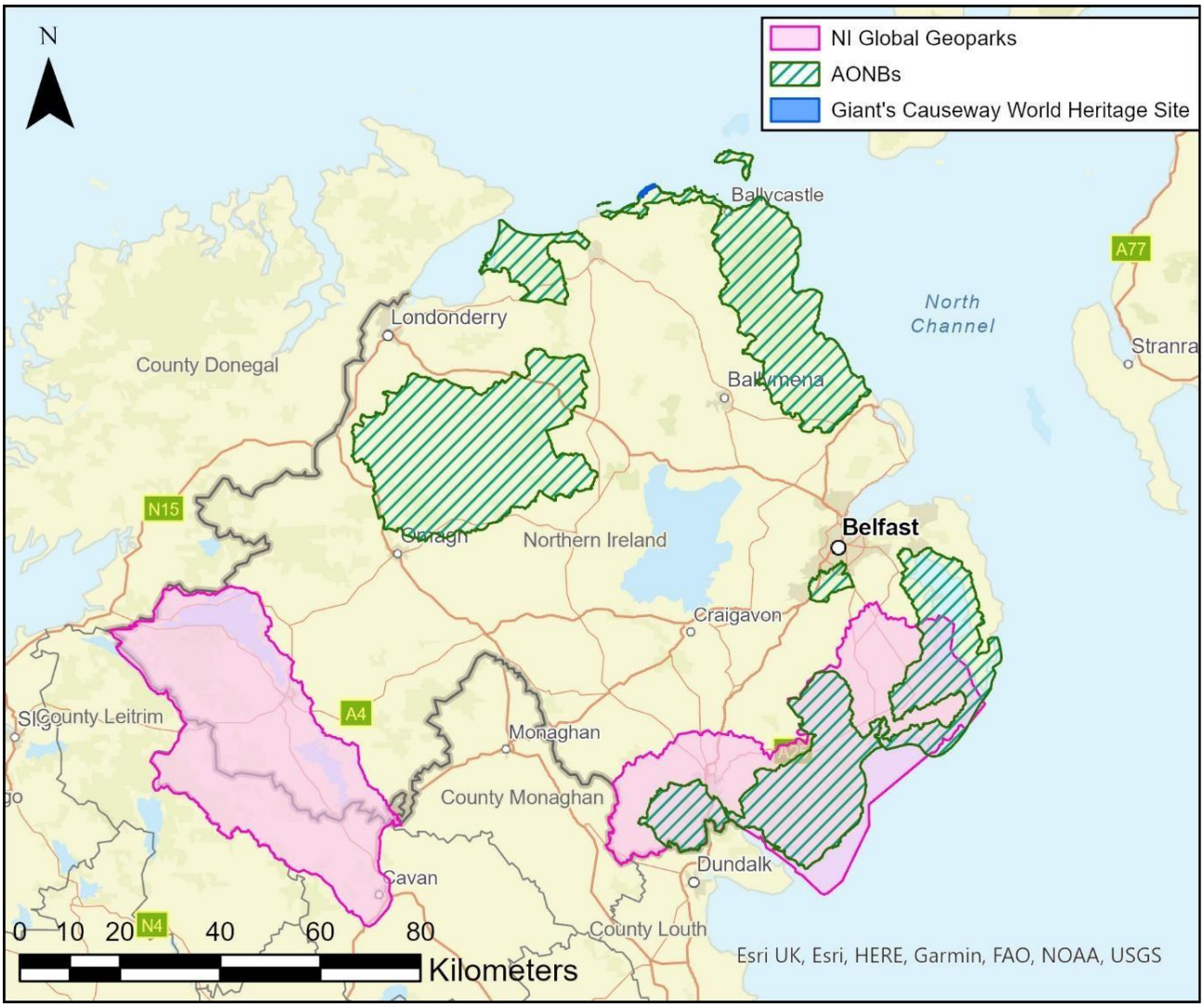

Figure 3-9: Location of AONBs, WHS and Global Geoparks within Northern Ireland

3.2.9.2 Landscape and Seascape Character Assessment

Landscape character assessments are used as a tool to identify the landscape features that give a locality its 'sense of place'. The use of landscape character assessments for this purpose arose in response to the European Landscape Convention of 2000. The Nature Conservation and Amenity Lands Order (NI) 1985 (NALCO) is the current legislative basis for the protection of landscapes. A Landscape Character Assessment of the whole territory of Northern Ireland was carried out in 1999, before the European Landscape Convention was published and became binding. The Northern Ireland Landscape Character Assessment 2000 (NILCA) (NIEA, 2000) subdivided the countryside into 130 Landscape Character Areas (LCAs), each based upon local patterns of geology, landform, landuse, cultural and ecological features. For each LCA, the key characteristics were described and an analysis of landscape condition and its sensitivity to change was made. The land use planning system will generally refer to the NILCA where development might affect the landscape character.

The Northern Ireland Regional Landscape Character Assessment (NIRLCA), developed in 2016, aimed to complement the NILCA by providing a regional framework upon which more detailed local studies could be based. This subdivided the countryside into 26 Regional Character Areas (RCAs), based upon information relating to people and place and the combinations of nature, culture and perception that contribute to local uniqueness. These aim to provide information on which to base plans at a more local level that might affect landscape character. In addition, the Northern Ireland Regional Seascape Character Assessment (DAERA, 2014) identified 24 Regional Seascape Character Areas (RSCAs) along the Northern Ireland coast, describing the key features and characteristics of each area, and relating these to neighbouring terrestrial LCAs. These are: Foyle Estuary RSCA, Lough Foyle RSCA, North Coast Strands and Dunes RSCA, The Skerries and Dunluce Coast RSCA, Causeway Coast RSCA, Ballycastle Coast RSCA, Rathlin RSCA, Torrr Head RSCA, Northern Glens Coast RSCA, Southern Glens Coast RSCA, The Gobbins RSCA, Larne Lough RSCA, Belfast Lough RSCA, Belfast Harbour RSCA, Ards Peninsula RSCA, Strangford Lough RSCA, Lecale Coast RSCA, Dundrum Bay RSCA, Mourne Coast RSCA, Carlingford Lough RSCA, Newry Estuary RSCA, Atlantic RSCA, North Channel RSCA, and Irish Sea (South Down) RSCA. These RSCAs were identified as distinct areas with a unique sense of place, with boundaries tending to represent indicative lines of gentle transition rather than an abrupt change in seascape character.

The NIEA also published Northern Ireland's Landscape Charter in 2014 in response to the European Landscape Convention, with the following affirmations and guiding principles for decision making: landscape is essential; landscape contributes to wellbeing; landscape is part of identity; landscape reflects culture; landscapes matter and each of us has a right to landscape benefit; landscapes are shared and each of us is responsible; landscape is a networked asset whose whole is more than the sum of its parts; landscape change is inevitable but can be managed to enhance value; and transparency engenders awareness and confidence. Those interested in the value of Northern Ireland's landscape can sign the charter, thereby committing to these affirmations and guiding principles through their actions.

3.2.9.3 Summary of Existing Pressures and Issues for Landscape and Visual Amenity in Northern Ireland

The main pressures on Landscape in Northern Ireland, according to the most recent State of the Environment report (2013), are development (including housing, industrial and recreational), infrastructure, extraction industries, agriculture and forestry, and tourism. Land cover and habitats have changed in the past few decades as a result of population increases, changes in household structure and employment patterns and agricultural restructuring. While the economic recession slowed the rate of developments for a period post-2008, actions to stimulate economic growth put continued pressure on urban and rural landscapes (NIEA, 2013).

There is not anticipated to be potential for any significant positive or negative, direct or indirect effects in the short, medium, or long-term to arise on Landscape and Visual Amenity from the implementation of the Plan measures, including the potential Wildlife Intervention Options. Interaction with areas of significance for landscape or visual amenity via disturbance or disruption from implementation of actions within the Wildlife Intervention Option should be limited to a short-term, temporary and localised basis. There is also unlikely to be potential for transboundary impacts on Landscape and Visual Amenity in the Republic of Ireland. Therefore, it is proposed to scope the SEA topic of Landscape and Visual Amenity out of assessment within the SEA Environmental Report.

Implementation of the Plan measures, including the potential Wildlife Intervention Options may have the potential to affect Landscape and Visual Amenity at a very localised level e.g., through disturbance or disruption to areas of significance for landscape or visual amenity.

3.3 Evolution of the Environment in the Absence of the Plan

The Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 require that consideration is given to the likely evolution of the current baseline where implementation of the Plan does not take place.

If the Plan is not implemented, biodiversity, flora and fauna, including protected sites, habitats and species, in Northern Ireland and transboundary areas of the Republic of Ireland would continue to exist in much the same pattern, abundance and density as today and subject to the current regulatory regime and the protections offered by the same. Many elements of biodiversity in Northern Ireland are likely to continue to show declines, through the impact of human activities such as land use change associated with agriculture (land reclamation, drainage, increased production and stocking rates, and subsequent impacts on water and air quality) and development for housing and infrastructure, pollution and fisheries. Priority and protected habitats and species are likely to continue to show an overall decline in status from pressures such as land management practices, water pollution and air pollution. In the absence of the Plan, the current pressures on biodiversity, flora and fauna in Northern Ireland are likely to continue, particularly those related to agriculture in relation to ammonia emissions associated with livestock and fertiliser and water pollution and eutrophication through poor slurry spreading techniques and management. There is potential for some improvements necessitated by other policies and legislation, such as through the requirements of the WFD Regulations and Northern Ireland RBMP, Nutrients Action Programme, Marine Strategy Regulations and Biodiversity Action Plans.

In the absence of the Plan, the population of Northern Ireland is expected to continue to increase followed by a projected decrease with the trend of an ageing population is likely to continue. Human health and wellbeing in Northern Ireland are likely to be affected more in the future by the effects of climate change, biodiversity loss and land degradation, and continue to be affected at a more local level through air quality, water quality effects on drinking water or food quality, or on recreational water-based resources such as bathing waters. Without the implementation of the Plan, bTB infection rates within cattle will likely continue to increase, increasing the risk of bTB exposure for farm workers and the local population, representing a potential health risk.

In the absence of the Plan, groundwater will continue to be most vulnerable to contamination in areas where bedrock outcrops are present or where glacial sands and gravels are present, particularly in areas of higher elevation. Poorly draining or waterlogged soils, which are abundant in Northern Ireland, particularly in areas of lower elevation, will continue to pose a risk to erosion and contaminant runoff, proving the greatest risk to downstream surface water bodies. There is currently little or no legislation relating directly to soils and soil protection in Northern Ireland.

In the absence of the Plan, existing EU Directives and associated measures for the protection of water would continue to be implemented, such as the Bathing Water Directive, Birds Directive, Drinking Water Directive, Seveso Directive, Sewage Sludge Directive, Urban Wastewater Treatment Directive, Nitrates Directive Habitats Directive, Integrated Pollution Prevention Control Directive and the Water Framework Directive. The existing potential point and diffuse source pollution pressures on water quality, including from industry, construction, septic tanks, agricultural and forestry practices are likely to remain, although there is potential for improvement in the status of some waterbodies through actions required by the WFD and Marine Strategy Regulations, including measures outlined in Northern Ireland's RBMP. Achieving improvements in water quality will require co-ordination across several Directives, Strategies and Regulations given the complexity of water management.

For air quality, the levels of many pollutant emissions are likely to continue to improve, while nitrogen dioxide emissions from traffic and ammonia emissions from the agriculture sector are expected to continue to pose a challenge, including in transboundary regions. Legislation aims to ensure that continual improvements occur regarding air quality under EU legislation such as the Clear Air for Europe Directive 2008/50/EC and the Air Quality Directive, the National Emissions Ceiling Regulations (2018), the UK Air Quality Strategy and Northern Ireland legislation such as the Air Quality Standards Regulations (Northern Ireland) 2010 and Air Quality Regulations (NI) 2003. Monitoring of noise and production of strategic noise maps will continue in line with the Environmental Noise Directive on the basis of the Common Noise Assessment Methods Directive for noise modelling. Noise Complaint Statistics for Northern Ireland have shown that noise pollution in Northern Ireland, typically originates from domestic sources, followed by commercial and leisure noise, and construction noise.

Noise complaints across Northern Ireland have continued to increase compared to 2003/04 and primarily relate to domestic noise complaints, it is likely that noise complaints will continue to increase in the absence of the Plan.

In the absence of the Plan, GHG emissions in Northern Ireland are predicted to continue to decrease overall, owing to further improvements in energy efficiency and transport improvements and necessitated by Northern Ireland's commitment to contribute fairly to the legally binding 'net zero' GHG emissions reduction targets set out in the UK Climate Change Act 2008, as amended in 2019.

In the absence of the Plan the overall number of farms in Northern Ireland is likely to continue to decrease, but the overall land area covered by agriculture to remain stable, as has been the trend for the past 30 years. The proportion of farm types is likely to vary somewhat depending on market changes; however, the predominant farm type is expected to remain as cattle and sheep. The total farm workforce in Northern Ireland may continue to show a decline. The total value of inputs and outputs to the agricultural sector in Northern Ireland will continue to be influenced by economic market fluctuations at a national and international level. The total income achieved will remain dependent on both product value and subsidy payments. In the absence of the Plan, agricultural assets such as cattle may experience decreased productivity due to increased risk of and continuation of bTB disease, impacting upon agricultural productivity with respect to cattle as an agricultural asset.

There are unlikely to be any significant changes to cultural, architectural, and archaeological heritage features in the absence of the Plan. Cultural heritage concerns will continue to be addressed as part of the planning process and related environmental assessments at lower planning tiers and at the project level. Some historic or heritage features will continue to be afforded protection under the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995, and from the Planning Act (Northern Ireland) 2011. Archaeology and built heritage will continue to be at risk from impacts associated with development, particularly in urban areas, and those associated with agricultural practices.

In the absence of the Plan, the landscape of Northern Ireland will likely continue to be affected by developments, infrastructure, agriculture, forestry, mineral extraction and tourism, with changes exacerbated by the predicted population increase. Landscape concerns would continue to be dealt with as part of the planning process and related environmental assessments at lower planning tiers and at the project level.

4 Review of Relevant Plans, Programmes and Policies

4.1 Interaction with other relevant Plans and Programmes

As part of the SEA process, the context of the Plan must be established with regard to other plans and programmes that have been adopted at International, National and Regional levels. In particular, the environmental protection objectives (EPOs) and standards included within these plans and programmes that will directly influence, or be influenced by, the Plan, require consideration. These EPOs have been used to create the Strategic Environmental Objectives (SEOs) that have been used for assessment of the Plan.

Table 4-1 identifies the main significant environmental plans, programmes and legislation adopted at International/European level, National/Regional level, or Sub-Regional level, which would be expected to influence, or be influenced by, the Plan. More information on these plans, programmes, and legislation, along with their potential interaction with the Plan, is given in **Appendix B**.

Table 4-1: Summary of Key Plans and Programmes Relevant to the Plan as associated with SEA topics proposed as scoped in within the SEA Environmental Report

Level	Plan / Programme / Policy / Legislation
International / EU Level	*Biodiversity* • UN Convention on Biological Diversity (1992) • Ramsar Convention on Wetlands of International Importance (1971 and amendments) • Bern Convention (Convention on European Wildlife and Natural Habitats) (1982) • Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals) (1983) • EU Biodiversity Strategy to 2030 • EU Birds Directive [2009/147/EC] • EU Habitats Directive [92/43/EEC] • EU Nature Restoration Law 2024 *Air quality* • Stockholm Convention (2004) • WHO Air Quality Guidelines – global update (2005) • The Gothenburg Protocol (1999) • Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive [2008/50/EC] & 4th Daughter Directive of the Air Quality Framework Directive [2004/107/EC] • National Emissions reduction Commitments (NEC) Directive [2016/2284/EU] • The Convention on Long-Range Transboundary Air Pollution (1979) *Noise* • Environmental Noise Directive [2002/49/EC] *Sustainable Development* • Common Agricultural Policy (CAP) (1962) • Seventh Environmental Action Programme to 2020 of the European Community

Level	Plan / Programme / Policy / Legislation
	• UN Convention on Environmental Impact Assessment (ESPOO Convention) 1997 and Kyiv (SEA) Protocol • SEA Directive [2001/42/EC] • UN Sustainable Development Goals (2015) *Waste* • Waste Framework Directive [2008/98/EC] • Use and Disposal of Animal By-products (Commission Regulation 2011/EU142) *Tuberculosis Control* • Animal Health Law [Regulation (EU) 2016/429] • Commission Delegated Regulation supplementing the Animal Health Law Regulation [(EU) 2020/689)
National / Regional Level	*Biodiversity* • Biodiversity Strategy for Northern Ireland to 2020 • UK Biodiversity Framework 2024 • UK National Biodiversity Strategy and Action Plan: Blueprint for halting and reversing biodiversity loss • Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 • The Wildlife (Northern Ireland) Order 1985 and amendment The Wildlife (Amendment) (Northern Ireland) Order 1995 • Wildlife and Natural Environment Act (NI) 2011 • The Environment (Northern Ireland) Order 2002 • DAERA Conservation Management Plans for SACs (in prep.) • Northern Ireland Species and Habitat Action Plans • The Draft NI Peatland Policy • The Environmental Protection (Restriction on Use of Lead Shot) Regulations (NI) 2009 *Air Quality* • UK National Air Pollution Control Programme (NAPCP) 2019 • Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 • Air Quality Standards Regulations (Northern Ireland) 2010 and amendments (2017) • The Pollution Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) 2013 • Clean Air Strategy for Northern Ireland – A Public Discussion Document, 2020 • DAERA Science Strategy Framework 2020-2035 • The Control of Noise at Work Regulations (Northern Ireland) 2006 *Sustainable Development* • Northern Ireland State of the Environment Report 2013

Level	Plan / Programme / Policy / Legislation
	• Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 • Northern Ireland Executive Programme for Government 2024-2027 • The Regional Development Strategy 2035 – Shaping Our Future • UK Sustainable Development Strategy, Agenda 21 • 10X Economy – An Economic Vision • Sustainability for the Future –"DAERA's Plan to 2050" • Draft Green Growth Strategy for Northern Ireland • Northern Ireland Food Strategy Framework • Draft Environment Strategy for Northern Ireland • Draft Rural Policy Framework • Northern Ireland Energy Strategy 2050 • Strategic Planning Policy Statement for Northern Ireland • Planning Policy Statement 2 'Natural Heritage' *Waste* • Northern Ireland Waste Management Strategy, 2012 • Waste Management Plan 2013 – 2020 *Tuberculosis Control* • Tuberculosis Control Order (Northern Ireland) 1999 *Noise* • Environmental Noise Regulations (Northern Ireland) 2006 • Environmental Noise (Amendment) Regulations (Northern Ireland) 2018 • Noise Emission in the Environment by Equipment for use Outdoors (Amendment) (Northern Ireland) Regulations 2025 • The Pollution Control and Local Government (NI) Order 1978 • Clean Neighbourhood and Environment Act (NI) 2011
National Level - Republic of Ireland	• National Biodiversity Action Plan 2023-2030 • Bovine TB Action Plan
Sub-Regional Level	• Local Biodiversity Action Plans (LBAPs)

5 Assessment Methodology

5.1 Approach to SEA assessment of effects

The measures assessed as part of the Plan have been outlined in **Section 2.7**. The measures assessed are categorised under the following sub-themes of the Blueprint:

1. Cattle Intervention
2. Wildlife Actions

The assessment has focussed primarily on the potential Wildlife Intervention Options as a subset of the Wildlife Actions of the Blueprint, considering the additional detail on potential Wildlife Options that is provided in the consultation document 'Consultation on the Department's Potential Wildlife Intervention Options for the control of Bovine Tuberculosis in Northern Ireland'.

A review of the baseline information and proposed measures within the Plan has indicated that the following topics are unlikely to lead to significant positive or negative, direct or indirect effects in the short, medium or long-term at the strategic national scale:

- Geology, Soils & Land Use (GSL);
- Water (W);
- Climatic Factors (CF);
- Cultural, Architectural and Archaeological Heritage (CH); and
- Landscape & Visual Amenity (L).

There may be potential for several highly localised effects on these topics from the implementation of the Plan as outlined in **Section 3**; however, these are not expected to be significant at a strategic national level, and it is also not expected that transboundary impacts will arise on these topics. At the SEA scoping stage, it was proposed that these topics were 'scoped out' i.e., not brought forward to the assessment stage. However, in their role as statutory SEA consultee, DAERA recommended that, although significant impacts are not anticipated, these topics should be considered within the assessment. Therefore, these SEA topics have been included within the environmental assessment in **Section 7** of this Environmental Report

Assessment of the Plan is relatively strategic, with the aim of reporting likely impacts at the national and regional level to reflect the scale at which the measures are applied. Assessment of the Plan comprised an assessment of the baseline environmental information available against the high-level objectives and potential issues. This method involved an assessment of each measure of the Plan against the following SEA topics:

- Biodiversity, Flora & Fauna (BFF);
- Population & Human Health (PHH);
- Geology, Soils & Land Use (GSL);
- Water (W);
- Air (A);
- Climatic Factors (CF);
- Material Assets (MA);
- Cultural, Architectural and Archaeological Heritage (CH); and
- Landscape & Visual Amenity (L).

The purpose of this was to predict and evaluate, as far as possible, the environmental effects of the Plan with a focus on the potential Wildlife Intervention Options, highlighting any environmental problems and/or benefits that are likely to arise from its implementation.

The proposed measures of the Plan were assessed in terms of their potential effects, and the significance of these effects, on the environment against a set of Strategic Environmental Objectives (SEOs). These SEOs were developed in the context of broader environmental protection objectives set at both international and national levels (outlined in **Section 4**) and also take into account the context of potential for effects associated with the Plan. Each of the environmental topics described in **Section 3** was assigned at least one high-level

SEO, specifying a desired outcome, against which the measures comprising the Plan were assessed. Each high-level SEO was paired with a specific target(s), as well as indicator(s) that can be used to measure the progress towards the achievement of these targets. These SEOs, Indicators and Targets are given in **Table 5-1**. **Table 5-2** indicates the inter-relationships present between the SEA topics assessed.

The assessment examined the likely significant effects of the measures comprising the Plan and how their implementation could contribute to achieving these SEOs. In line with the SEA Directive, measures were assessed in the short, medium and long term for likely effects (both direct and indirect effects), the significance of the effects, and whether they are positive or negative effects. For the purposes of this assessment:

- Plus (+) indicates a potential positive environmental effect;
- Minus (-) indicates a potential negative environmental effect;
- Plus/minus (+/-) indicates that both positive and negative environmental effects are likely or that, in the absence of further detail, the potential effects are unclear. If a situation arises whereby positive impacts out way negative effects, or *vice versa*, an additional + or – will be used (++/- or +/--); and
- Zero (0) indicates neutral or no environmental effect.
- Short term – 0 – 2 years (Immediate);
- Medium term – 2 – 4 years; and
- Long term – beyond 4 years.

Other effects that have been assessed for significance are secondary effects, cumulative effects, synergistic effects, temporary and permanent effects, and the inter-relationship of effects.

All potential positive and negative effects were presented individually, with a text description, and a summary table. Under each measure, a discussion was presented to support the assessment outcomes. Some actions were not suitable for detailed assessment, such as those relating to administration issues, coordination or data gathering; in these cases, a qualitative statement has been made to describe how the action might support the overall approach

Table 5-1: Strategic Environmental Objectives, Targets and Indicators

SEA Topic	Objective	Objective Description	Indicators	Targets
Biodiversity, Flora & Fauna	Avoid damage to, and where possible enhance, biodiversity, flora and fauna.	Preserve, protect, maintain and, where possible, enhance biodiversity and ecosystems within NI, including internationally, nationally, and locally protected sites, habitats and species, and other known species of conservation concern.	• Conservation status of designated habitats and species within International/ European and national designated sites (SACs, SPAs, Ramsar sites, MCZs, ASSIs). • Status of protected and priority habitats and species (e.g., Annex I habitats, Annex II species and Annex IV species, NI Priority Habitats and Species, OSPAR Threatened or Declining Habitats and Species). • Population dynamics, status and abundance of species	• No negative change, or a positive change, in the conservation status of designated habitats and species within International, European and National designated sites. • No negative change, or a positive change, in the status of protected or priority species and habitats outside designated sites, or to areas of known importance. • No negative long-term change in the status of species protected through the Wildlife (NI) Order 1985 and amendment The Wildlife (Amendment) (Northern

SEA Topic	Objective	Objective Description	Indicators	Targets
			protected through the Wildlife (NI) Order 1985 and amendment The Wildlife (Amendment) (Northern Ireland) Order 1995, including badgers.	Ireland) Order 1995 at a national level.
Population & Human Health	Reduce rate of TB incidence in the population and avoid generation of noise disturbances.	Reduction in the occurrence of bTB in humans and avoidance of significant noise disturbance.	• bTB incidence rates in the population. • Local council noise disturbance rates.	• No negative change, or a positive change, in the bTB incident rates in the population. • No negative change in local council noise disturbance rates/incidents because of culling activities.
Geology, Soils and Land Use	Protect soils from pollution and prevent degradation or loss of the soil resource.	Protect against physical damage to, or loss of, the soil resource.	• Soil health and quality of agricultural land. • Soil resource within the agriculture sector.	• No negative change, or a positive change, in soil health and land quality. • No loss of the soil resource.
Water	Avoid impacts on, and where possible enhance, the status or quality of waterbodies.	Protect and restore water quality from pollution.	• WFD status of surface and groundwater bodies, including Protected Areas.	• No negative change, or a positive change, in the status of surface water and groundwater bodies, including Protected Areas, and potential to contribute to the achievement of water body objectives under the WFD Regulations.
Air	Avoid, prevent or reduce harmful effects on human health and the environment resulting from emissions and noise pollution to air.	Avoid air quality and noise impacts.	• Quantity and trends of air emissions. • Local council noise disturbance rates.	• No negative change in the quantity of emissions to air arising from the potential Wildlife Intervention Options. • No negative change in local council noise disturbance rates/incidents as a result of potential Wildlife Intervention Options.

SEA Topic	Objective	Objective Description	Indicators	Targets
Climatic Factors	Avoid, prevent or reduce GHG emissions.	Avoid or reduce impacts to GHG emissions.	• Quantity and trends of GHG emissions.	• No negative change in the quantity of GHG emissions to air arising from the potential Wildlife Intervention Options.
Material Assets & Infrastructure	Support economic agricultural activities and productivity through reduction in bTB incidence and herd breakdowns.	Support agriculture industries focused on cattle production through fewer bTB incidents and herd breakdowns with improvements in livestock health and biosecurity.	• Agricultural outputs and productivity. • bTB incident rates in livestock. • bTB herd breakdown rates. • Quality of animal products available for consumption	• Sustainable increase in agricultural productivity, i.e., a more efficient use of resources with fewer bTB affected cattle slaughtered. • Decrease in the occurrence of bTB affected cattle numbers and herd breakdowns. • No negative change, or a positive change in the quality of animal products.
Cultural, Architectural and Archaeological Heritage	Protect, conserve, and enhance designated and nondesignated heritage assets and their settings	Protect, conserve, and enhance designated and non-designated heritage assets and their settings.	• Number, condition and setting of international, national and local heritage designations.	• No loss or negative change to the condition or setting of international, national and local heritage designations.
Landscape and Visual Amenity	Protect, and where possible enhance, the character and quality of landscapes, riverscapes, and lakescapes.	Protect and enhance the character and quality of landscapes, riverscapes, and lakescapes.	• Landscape/ Seascape Character Assessments. • Local Development Plan scenic views and Areas of High Scenic Value.	• No negative change, or a positive change, in visual amenity or landscape / seascape character and local views.

Table 5-2: Potential Inter-Relationships between SEA topics

Environmental Topic	Air	Biodiversity, Flora & Fauna	Climatic Factors	Cultural Heritage	Geology, Soils & Land use	Landscape & Visual Amenity	Material Assets & Infrastructure	Population & Human Health	Water
Air									
Biodiversity, Flora & Fauna	Y								
Climatic Factors	Y	Y							
Cultural Heritage	N	Y	N						
Geology, Soils & Land Use	Y	Y	Y	Y					
Landscape & Visual Amenity	N	Y	N	Y	Y				
Material Assets & Infrastructure	Y	Y	Y	Y	Y	Y			
Population & Human Health	Y	Y	Y	Y	Y	Y	Y		
Water	N	Y	Y	Y	Y	Y	Y	Y	

5.2 Difficulties and Data Gaps

The proposed measures of the Plan are at different stages of planning and development; some are administrative in nature and unlikely to have significant effects on the environment and were thus scoped out of assessment as noted in **Section 2.7.1**. Some proposed measures consist of a general statement, whereas others provide more specific details for measures to be implemented. Measures can only be assessed at the level at which they are set. Those measures for which a greater level of detail has been provided in the Plan are easier to assess than those with less, making it difficult to give an assessment that is level across all measures.

The majority of the proposed measures will be applicable over a large geographic scale such as those relating to cattle health and biosecurity, covering farms across Northern Ireland. Some measures, such as the proposed potential Wildlife Intervention Options will be implemented only within specific intervention areas on a smaller spatial scale. At a strategic level of assessment, there is some difficulty and uncertainty in assessing the implications of the implementation of the Plan measures at these differing levels.

Some of the proposed measures aim to focus on reviewing and developing proposals for the management of bTB, evaluating the effectiveness of these and incorporating lessons learned into future strategies; there will be a level of uncertainty regarding the long-term effects of implementing these measures, which may require further research and monitoring to assess any potential implications.

These differences present some difficulties in the level at which the measures can be assessed; assessments have been made at a high level across all measures taking the assumption that all measures will be subject to appropriate implementation while also highlighting where uncertainty exists. Where difficulties or uncertainties such as described above have been identified during assessment, recommendations and mitigation have been provided.

6 Consideration of Alternatives

6.1 Consideration of Alternatives

The purpose of this section is to outline the reasons for choosing the Plan as the preferred alternative in light of other reasonable alternatives considered. The consideration of alternatives is a requirement of the SEA Directive (2001/42/EC). Article 5(1) states that: '*where an environmental assessment is required under Article 3(1), an environmental report shall be prepared in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated.*' The Directive does not state at what stage consideration of alternatives should occur, however, to present a useful input into the policy/plan making process, all guidance points to considering alternatives as early as possible.

The consideration of alternatives has been informed by the following guidance documents;

- A Practical Guide to the Strategic Environmental Assessment Directive. September 2005. Office of the Deputy Prime Minister (ODPM). Appendix 6 Developing and Assessing Alternatives; and
- Development and Assessing Alternatives in Strategic Environmental Assessment, EPA 2015.

ODPM (2005) recommends that only reasonable, realistic, and relevant alternatives need to be put forward, and that these should be sufficiently distinct to enable meaningful comparisons between them. These may be discrete broad options, that involve a choice between one alternative and another and alternatives that can be combined in various ways. There may be a hierarchy of alternatives for key plan/programme issues such as exploring the mode/type, location, and implementation/timing. EPA (2015) also recommends that alternatives should be realistic, reasonable, viable, and implementable, and sets out the types of alternatives that may be appropriate to consider as follows:

- *Strategic*: high-level options that achieve a given objective
- *Value-oriented*: alternatives that address policy priorities, cultural values or safety issues.
- *Effects oriented*: alternatives that address issues identified during scoping. Such alternatives are effective at mitigating potential significant effects.
- *Sectoral prioritisation*: alternatives that look at sectoral feasibility and needs, e.g., to promote one sector versus another.
- *Spatial*: alternative locations for the implementation of planning objectives, particularly relevant at the local level.
- *Modal*: different technical/mode alternatives to achieve the same objective.
- *Temporal*: alternatives for the timing of implementation of plan/programme measures, most suitable at the local level for addressing infrastructure development.

The SEA team discussed the potential alternatives under consideration during the development of the Plan with the DAERA programme development team and suggested the potential types of alternatives that could be considered. Following this consideration, the following strategic-level alternatives were considered:

- Alternative 1 – Do nothing. No new measures for the control of bTB are introduced in Northern Ireland.
- Alternative 2 – Strategy option: no inclusion within the Plan of the further developed potential Wildlife Intervention Options and only implementation of the Blueprint measures.
- Alternative 3 – Preparation and adherence to the measures within the Plan, which includes further developed potential Wildlife Intervention Options.

The following sections provide a comparative evaluation of the likely environmental effects of implementing these strategic-level alternatives and determine the likely positive or negative effects against the SEOs.

The potential Wildlife Intervention Options comprise three potential options which may be implemented. i.e. nonselective culling; test and vaccinate and remove; and vaccination only. These options can be considered as alternatives for the implementation of the potential Wildlife Intervention Options and are assessed fully in **Section 7.2**.

6.1.1 Strategic Alternative 1

This strategic-level alternative considers the option of no programme, or the do-nothing scenario.

EPA (2015) considers that a “do-nothing” alternative should be included for sectoral plans/programmes or their components, to assess the future baseline without implementation of the plan/programme, and to test whether the plan/programme is needed at all.

In this alternative, the current bTB control programme of the Bovine Tuberculosis Control Scheme (NI) 2024 (DAERA, 2026) will continue whereby herds are subject to annual testing by DAERA approved Veterinary Surgeons using the CITT. All cattle slaughtered for human consumption undergo Post Mortem Examination for the presence of bTB lesions. All cattle herds within Northern Ireland are also allocated an official tuberculosis (OT) herd status, herd status reason and a next test type. The herd status may be officially tuberculosis free status (OTF), officially tuberculosis free status suspended (OTS) or officially tuberculosis free status withdrawn (OTW); a failure to test herds annually results in an immediate OTS with any further delays leading to downgrading to OTW. Should an animal result in two non-negative/inconclusive tests for the second consecutive skin test for TB, this will result in the mandatory removal of the animal as a reactor. Any cattle found to be bTB reactors are removed by DAERA subcontracted hauliers for immediate slaughter. Slaughter may also require full herd depopulation if this is deemed as necessary to prevent the spread of the disease. Total herd depopulation will also result in further movement restrictions on herds and a requirement to undertaken disinfection, slurry control measures and future bTB tests following re-stocking at required intervals. Movement controls on cattle from existing herds is controlled by the herd OT status. Movement controls are recorded with respect to both market and abattoir as well as herd movements. Herds of OTS and OTW status are subject to an immediate movement restriction. Presently compensation for animals slaughtered due to bTB is paid by DAERA at 100% of the market value of the animal(s).

In this alternative there will be no introduction of any further cattle intervention, any wildlife intervention measures and the current situation regarding financial compensation will continue. DAERA has indicated that the current expenditure on the bTB eradication programme is unsustainable and disease trends are continuing to increase. Without addressing both cattle intervention and the wildlife reservoir of disease, DAERA has indicated that it is of the view that no improvements in bTB will be achieved with continued disease prevalence, herd breakdowns and high associated costs for compensation of bTB slaughtered cattle. This will result in continued slaughter of cattle and herd restrictions with negative implications for herd owners. Monthly bTB statistics are published by DAERA for cattle, and data published between January 2014 to October 2025 has indicated increases in confirmed herd prevalence of the disease, with a continued increasing trend. In January 2014, confirmed herd prevalence was approximately 7%, and a general increasing trend has occurred since, with confirmed herd prevalence at c. 14.5% in October 2025. The failure to introduce new measures to address bTB prevalence amongst cattle herds suggests that disease rates will fail to significantly decrease.

6.1.2 Strategic Alternative 2

In this alternative, no potential Wildlife Intervention Options will be introduced with only measures proposed within the Blueprint with regard to Cattle Intervention, Finance and administration measures under People, Partnership and Science introduced. The introduction of Cattle Intervention measures is expected to lead to improvements in farm biosecurity, improved testing (of both bovines and non-bovines), and improved controls on herd movements, with a reduction in bTB infections and herd breakdowns. Addressing Finance measures should enable improvements to be made regarding the presently high and unsustainable levels of expenditure associated with bTB eradication, particularly with regard to compensation payments for bTB slaughtered cattle.

As described for strategic alternative 1, monthly bTB statistics published by DAERA has indicated increases in confirmed herd prevalence of the disease, with a continued increasing trend between 2014 and 2025. In general, this suite of measures has potential for positive effects on the SEOs, through a reduction in bTB infection incidences. There is potential for positive direct effects on the farming population and the SEO for MA (with respect to cattle as an agricultural asset) through improved biosecurity and overall cattle health through greater testing and controls on cattle movement reducing the risk of bTB infections and herd breakdowns. There is potential for positive indirect effects on the SEO for PHH through reduced disease prevalence of bTB within cattle reducing the risk of bTB infection amongst farm workers and the general population. The significance of the positive effects on MA will be dependent on the level of compliance and adherence achieved to the measures. However, the timescales associated with achieving reduced bTB rates may be greater due to the continued presence of bTB infection within the wildlife reservoir, as no wildlife intervention measures will be

implemented under this alternative. There is therefore potential for bTB infection transmission to continue in this manner.

6.1.3 Strategic Alternative 3

This alternative is the implementation of the measures outlined in the Plan with the inclusion of the potential Wildlife Intervention Options. The Plan has been developed based on a consideration of the previous Bovine Tuberculosis Eradication Strategy for Northern Ireland measures published by DAERA in 2022, and with a review of the approach on the eradication and control of bTB undertaken by the CVO.

The development of the plan has also considered the previous wildlife intervention element of the Eradication Strategy, which was subject to judicial review in 2022, and which was overturned in 2023. In April 2025, the TBPSG produced the Bovine TB in Northern Ireland: Blueprint for Eradication, taking into account the CVO's review of bTB within Northern Ireland and building upon the DAERA Bovine Tuberculosis Eradication Strategy for Northern Ireland 2022. The proposed potential Wildlife Intervention Options have been developed based on the Department's view of what are viable, and evidence-based and which could make a significant and positive impact on disease levels. This has involved input from NIEA, VSAHG and the Department's Chief Scientific Adviser.

A comprehensive assessment of implementing the Plan has been undertaken in detail in **Section 7.1** and **Section 7.2**. The overall potential for positive and negative effects on SEOs from implementing the combined measures proposed from the Plan has been assessed comparatively with Strategic Alternative 2, as illustrated below. There is greater potential for positive effects in the medium to long-term across most SEOs from implementing the proposed measures included within the Plan.

The proposed measures include the Cattle Intervention measures designed to reduce bTB infections and herd breakdowns through improvements in biosecurity, increased testing and movement restrictions with potential for positive environmental effects on the SEOs for MA and BFF. With the introduction of the potential Wildlife Intervention Options, there is potential for negative environmental effects on the SEO for BFF from the use of culling on local badger populations. However, where measures will use vaccination, there is potential for positive environmental effects on the SEO for BFF through reduced bTB disease within the badger population with improvements in badger health. The potential Wildlife Intervention Options have potential for positive environmental effects on the SEOs for PHH and MA, through addressing the wildlife reservoir of bTB infection; there is reduced potential for infection within cattle (as an agricultural asset) and thus a reduced potential risk for farm workers and the local population to contract bTB.

The implementation of the proposed measures has potential for negative effects on the SEOs for A and PHH, through the potential use of shooting as a culling means owing to the introduction of shooting noise. This may impact human health in the short-term through potential night-time disturbances to local populations; however, in the long-term, there is potential for greater health benefits through reduced potential for the occurrence of bTB infections and improvement in the quality of agricultural products produced for human consumption.

6.2 Preferred Alternative

The preferred strategic alternative considered is Strategic Alternative 3: Preparation and adherence to the measures within the Plan which includes the potential Wildlife Intervention Options. Strategic Alternative 3 is expected to provide a greater potential for positive effects across the SEOs for BFF, PHH, A and MA.

The assessment of the proposed measures of the Plan detailed in **Section 7.1** and **Section 7.2** indicate the potential for some negative and uncertain effects on SEOs. However, with the continued increases in bTB infection rates and herd breakdowns, it is necessary to implement the Plan to achieve reductions in disease rates. There is potential for negative effects on BFF through badger culling under the potential Wildlife Intervention Options and, if this option if progresses, there will be a requirement for monitoring to ensure that adverse population effects on badgers do not emerge within intervention areas as a result of the Plan that could contravene the objectives of the Bern Convention. As noted in the assessment in **Section 7,** the proposed measures would benefit from additional information and clarification from DAERA. The preferred alternative is to move forward with Strategic Alternative 3. The SEA has provided an assessment of the proposed measures within the Plan and recommended additional information which should be included within the Plan to minimise the potential effects arising from the implementation of the measures.

7 Environmental Assessment of the Plan

The purpose of this section of the Environmental Report is to evaluate as far as possible the environmental effects of implementing the Plan.

7.1 Assessment of measures within the Blueprint

The Blueprint describes 34 measures, with various timeframes for delivery that are included under five subthemes. **Section 2.7.1** described these measures and those that would be included in the assessment, with potential for strategic level effects on SEA topics. This includes certain measures under two of the five subthemes, Cattle Intervention, and Wildlife; the assessment of these measures is included, by sub-theme in **Table 7-1**, and **Table 7-2**, respectively.

It should be noted that Wildlife measures included in the Blueprint and assessed in **Table 7-2** are high-level in their description; as detailed in **Section 2**, the Wildlife Intervention subset of these measures have been further developed and a greater level of detail is provided for these in the 'Consultation on the Department's Potential Wildlife Intervention Options for the control of Bovine Tuberculosis in Northern Ireland', which is assessed in **Section 7.2**.

Table 7-1: Assessment of Blueprint measures under the Sub-Theme of Cattle Intervention

Measure	Description of Measure	Potential Outcomes for SEA Topics								
Cattle Intervention										
Field Surveillance and Testing	*Short-term:* Develop enhanced training for all vets involved in the bTB testing process, including awareness of the need for compliance with proper cold storage and transport of tuberculin. Review criteria used to monitor testing performance and roll out increased surveillance. *Medium-term:* Review the effectiveness of enhanced training, learning from feedback to increase its effectiveness. Review effectiveness of enhanced monitoring and supervision of tests and incorporate lessons learned to increase effectiveness.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		0	+	0	0	0	0	+/-	0	0
Abattoir Surveillance	*Short-term:* Deliver refresher training for all staff to ensure abattoir surveillance is vigorously applied.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		0	+	0	0	0	0	+/-	0	0
Interferon Gamma (IFNg) Testing	*Short-term:* Review criteria for IFNg testing and evaluate possibility of introducing compulsory IFNg testing, with initial target of 24,000 tests per annum to protect herds from future risk of bTB breakdowns. Deliver pilot that extends testing window from 8 hours to 24 hours.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		0	+	0	0	0	0	+/-	0	0

Measure	Description of Measure	Potential Outcomes for SEA Topics								
	Medium-term: Evaluate potential for introduction of a compulsory target to at least 36,000 tests per annum. *Long-term:* Evaluate potential for introduction of a compulsory target to at least 45,000 tests per annum.									
Criteria for Officially Tuberculosis Free (OTF) Status	*Short-term:* Undertake preliminary work to consider the criteria for suspending or withdrawing OTF status, including legal advice as appropriate. *Medium-term:* Continue to develop proposals, incorporating legal advice, on the feasibility of further restricting herds.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		0	0	0	0	0	0	+/-	0	0
Inconclusive Skin Reactors (ICs)	*Short-term:* Develop and deliver proposals for managing inconclusive skin reactors.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		0	0	0	0	0	0	+/-	0	0
Full and Partial Depopulations	*Short-term:* Review depopulation policy, evaluate and implement proposals for restocking following depopulation. *Medium-term:* Review effectiveness of earlier proposals for restocking following depopulation, incorporating lessons learned to make improvements.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		0	0	0	0	0	0	+/-	0	0
Restocking after bTB Breakdown and Application of Severe Breakdown status	*Short-term:* Review criteria for the application of severe herd restrictions and associated impacts as regards to restocking. Evaluate and implement risk-based options for restocking breakdown herds. *Medium-term:* Review effectiveness of earlier proposals for restocking breakdown herds, incorporating lessons learned to make improvements.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		0	0	0	0	0	0	+/-	0	0
	Short-term: Establish Taskforce to conduct an in-depth	BFF	PHH	GSL	W	A	CF	MA	CH	L

Measure	Description of Measure	Potential Outcomes for SEA Topics								
Herds with prolonged and recurring breakdowns	epidemiological investigation in herds with prolonged and recurring breakdowns and develop bespoke interventions and advice. Develop and implement pilot based on advice from the Taskforce. *Medium-term:* Review effectiveness, incorporate lessons learned and consider further roll out of Taskforce support service.	0	+	0	0	0	0	+	0	0
Whole Genome Sequencing	*Short-term:* Work with the Agri-Food and Biosciences Institute to expand and make greater use of data to better understand transmission pathways and support breakdown case management. Explore possibility for pilot projects to drive this forward. *Medium-term:* Integrate whole genome sequencing into case management and epidemiological investigations. Review any possible pilot project. *Long-term:* Consider further advances in genetic analysis to ensure bTB programme has available the full range of epidemiological information to make informed decisions on existing and future disease intervention strategies.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		0	+	0	0	0	0	+	0	0
Legislative powers to test non-bovines for bTB	*Short-term:* Draft legislation to extend non-bovine testing powers to farms with no cattle present (e.g. those contiguous to cattle farms). *Medium-term:* Subject to consultation, progress the necessary legislative amendments.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		0	0	0	0	0	0	+/-	0	0
		BFF	PHH	GSL	W	A	CF	MA	CH	L

Measure	Description of Measure	Potential Outcomes for SEA Topics								
Restrictions and risk-based trading	*Short-term:* Evaluate options for pre & post movement testing and develop proposals to ensure compliance with legislative requirements. Develop & commence implementation of proposals for informed purchasing, including information sharing and mapping requirements. *Medium-term:* Evaluate effectiveness of earlier proposals, incorporating lessons learned to improve approach. Explore options for further sharing of information on bTB herd classification. *Long-term:* Consider potential for the introduction of additional restrictions. Continue to evaluate effectiveness of earlier proposals, incorporating lessons learned to improve approach.	0	0	0	0	0	0	+/-	0	0
Herd Health Management & Biosecurity Advice	*Short-term:* Develop proposals for providing biosecurity advice by/to industry and aligning herd health & biosecurity with other DAERA animal health programmes & wider programmes. Implement a fit for purpose biosecurity assessment protocol. *Medium-term:* Review effectiveness of earlier proposals, incorporating lessons learned to improve approach. Consider proposals that align herd health & biosecurity with other DAERA programmes and industry programmes and priorities.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		+	+	0	0	0	0	+	0	0
Capital grants for safe and effective on farm testing facilities and biosecurity improvements	*Short-term:* Explore options for providing grant aid to improve animal handling/testing facilities and to undertake works aimed at improving biosecurity as part of the wider DAERA sustainable agriculture programme *Medium-term:* Subject to finance availability, implement scheme	BFF	PHH	GSL	W	A	CF	MA	CH	L
		+/-	+/-	0	0	0	0	+	0	0

Measure	Description of Measure	Potential Outcomes for SEA Topics

These measures aim to reduce the incidences of bTB outbreaks within cattle herds through enhancing herd health with improved biosecurity. If effectively implemented, these should have positive implications for the environment over the baseline scenario where no such protections exist.

Field Surveillance and Testing

This measure sets out the development of enhanced training for vets involved in testing for bTB particularly regarding compliance with cold storage and the transport of tuberculin and review of the criteria used to monitor the performance of testing and increasing surveillance (accuracy) in the short-term. In the medium term, this measure aims to review the effectiveness of the enhanced training and associated monitoring/supervision of tests and incorporate this information to increase the effectiveness of the measure.

There is potential for both positive and negative effects on the SEO for MA from the implementation of this measure. There is potential for short-term direct negative effects on the SEO for MA should improved testing lead to increased detection of bTB leading to further cattle culling with the loss of cattle as an agricultural asset and associated financial implications for the herd owner. There is potential for medium to long-term indirect positive effects on the SEO for MA with improved testing standards and accuracy leading to improved detection of bTB addressing biosecurity and disease spread amongst herds helping to reduce overall incidences of bTB and therefore reduce negative health impacts on cattle as an agricultural asset and reduce financial implications for the herd owner in the long-term. There may also be potential for indirect secondary slight positive effects in the medium to long-term on PHH through improved testing standards leading to reduced potential for TB infection amongst farm workers.

The SEOs for BFF, GSL, W, A, CF, CH and L are scored as neutral as there is not considered to be any pathway for strategic-level positive or negative effects from the implementation of this measure.

Abattoir Surveillance

This measure sets out the delivery of refresher training for all staff to ensure that abattoir surveillance is vigorously applied in the short-term. In Northern Ireland, the use of post-mortem examinations is an important surveillance measure used for detecting bTB lesions within slaughtered animals and can detect herd breakdowns. Pascual-Linaza et al. (2016) indicate that, within Northern Ireland, it is estimated that between 18-28% of new bTB herd breakdowns have been detected in this manner.

There is potential for both positive and negative effects on the SEO for MA from the implementation of this measure. There is potential for short-term direct negative effects on the SEO for MA should improved abattoir surveillance increase the detection of bTB lesions and by consequence identify new bTB herd breakdowns leading to further cattle culling and/or herd restrictions with financial implications for the herd owner through the loss of cattle as an agricultural asset. There is potential for medium to long-term indirect positive effects on the SEO for MA with improved bTB lesion detection leading to improved detection of bTB herd breakdowns addressing biosecurity and disease spread amongst herds helping to reduce overall incidences of bTB and therefore reducing negative health impacts on cattle as an agricultural asset and financial implications for the herd owner in the long-term. There may be slight potential for indirect secondary positive effects in the medium to long-term on PHH through improved testing standards leading to reduced potential for TB infection amongst farm workers.

The SEOs for BFF, GSL, W, A, CF, CH and L are scored as neutral as there is not considered to be any pathway for strategic-level positive or negative effects from the implementation of this measure.

Interferon Gamma (IFNg) Testing

This measure sets out the reviewing of the criteria for IFNg testing and an evaluation of the possibility of introducing compulsory IFNg testing, with a short-term initial target of 24,000 tests per annum to protect against future bTB breakdowns. It also includes delivering a pilot that extends testing windows from 8 hours to 24 hours in the short-term to alleviate pressures associated with herd testing located at a distance from the testing laboratory at Stormont. In the medium-term, this measure aims to evaluate the potential for the introduction of a compulsory target of at least 36,000 tests per annum. In the long-term, this measure aims to evaluate the potential for the introduction of a compulsory target of at least 45,000 tests per annum.

Measure	Description of Measure	Potential Outcomes for SEA Topics

There is potential for both positive and negative effects on the SEO for MA from the implementation of this measure. The IFNg test is a supplementary blood test used alongside the tuberculin skin test to maximise the probability of detecting bTB infections amongst cattle, with the use of this test aiming to shorten the duration of a herd bTB breakdown and reduce the risk of undetected infected animals leaving cattle herds following the removal of movement restrictions. Presently, the testing window for IFNg requires blood sample processing to commence within 8 hours of sample collection. A research project has indicated that this window can increase to 24 hours with the use of temperature-controlled boxes. Extension of the testing window would alleviate the time pressure associated with the testing of larger herds located at a distance from the processing laboratory at Stormont.

There is potential for short term direct negative effects on the SEO for MA should increased testing lead to an increased detection of bTB requiring further cattle slaughter and/or herd restrictions with financial implications for the herd owner through the loss of cattle as an agricultural asset. There is potential for medium to long-term indirect positive effects on the SEO for MA with improved bTB detection leading to improved detection of bTB herd breakdowns addressing biosecurity and disease spread amongst herds helping to reduce overall incidences of bTB and therefore reduce financial implications for the herd owner in the long term through reducing implications on cattle health as an agricultural asset. There may be potential for slight indirect secondary positive effects in the medium to long-term on PHH through improved testing standards leading to reduced potential for TB infection amongst farm workers.

There is uncertainty regarding the costs associated with increased testing targets and if this will be funded directly by herd owners or through government schemes, with negative effects should this financial responsibility fall to herd owners as this may represent increased financial expenditure in the medium to long-term particularly when combined with the loss of cattle as an agricultural asset through increased slaughter or movement restrictions, and impact on agricultural productivity.

The SEOs for BFF, GSL, W, A, CF, CH and L are scored as neutral as there is not considered to be any pathway for strategic-level positive or negative effects from the implementation of this measure.

Criteria for Officially Tuberculosis Free (OTF) Status

This measure sets out undertaking preliminary work to consider the criteria used for suspending or withdrawing OTF status in the short-term. In the medium-term, this measure aims to continue to develop proposals on the feasibility of further restriction of herds, subject to legal advice.

In the short-term, the potential for effects on the SEO for MA are uncertain, as it is unclear if the criteria surrounding OTF status may become stricter or more relaxed. In the medium to long-term, there is potential for both negative and positive effects on the SEO for MA. The measure suggests that there is potential for increased restriction on herds, which may lead to direct negative effects on MA through impacts on cattle movements and effects on farm productivity with respect to cattle as an agricultural asset, however further restrictions on the movement of TB-infected herds would improve biosecurity and prevent further bTB outbreaks/infection spread.

The SEOs for BFF, PHH, GSL, W, A, CF, CH and L are scored as neutral as there is not considered to be any pathway for strategic-level positive or negative effects from the implementation of this measure.

Inconclusive Skin Reactors (ICs)

This measure aims to develop and deliver proposals for managing inconclusive skin reactors in the short term. In the short-term, it is uncertain regarding the potential for effects on the SEO for MA, as the measure is unclear on what the specific proposals will involve and how this may impact on cattle which present as inconclusive skin reactors for potential bTB infections. This measure is scored as neutral across all other SEO topics.

Full and Partial Depopulations

This measure aims to review existing depopulation policy and evaluate and implement proposals for restocking following depopulation in the short-term. In the medium-term, this measure aims to review the effectiveness of the short-term actions and incorporate improvements. Existing herd depopulation is

Measure	Description of Measure	Potential Outcomes for SEA Topics

considered when 30% of the herd has tested positive for bTB; should 50% test positive, herd depopulation must be considered immediately.

In the short and medium-term, the potential for effects on the SEO for MA is uncertain, as the measure is unclear on what the specific review, evaluation and implementation may result in for depopulation and restocking policy, and how this may impact a herd owner being able to re-establish a herd following a depopulation to enable agricultural productivity and outputs to commence with respect to cattle as an agricultural asset. This measure is scored as neutral across all other SEO topics.

Restocking after bTB Breakdown and Application of Severe Breakdown status

This measure aims to review the criteria for the application of severe herd restrictions and associated impacts with regard to restocking, and to evaluate and implement risk-based options for restocking breakdown herds in the short-term. In the medium-term, this measure aims to review the effectiveness of the short-term actions and incorporate improvements.

In the short and medium-term, the potential for effects on the SEO for MA is uncertain, as the measure is unclear on how the criteria may be reviewed regarding a severe herd breakdown, and how restocking may be affected, with the outcomes of this influencing how a herd owner may be able to re-establish a herd following a severe herd breakdown and the need for restocking to enable agricultural productivity and outputs to commence with respect to cattle as an agricultural asset. This measure is scored as neutral across all other SEO topics.

Herds with prolonged and recurring breakdowns

This measure aims to establish a taskforce to undertake epidemiological investigations into herds which suffer recurring and prolonged breakdowns, with the development of bespoke interventions and advice and the implementation of a pilot based on advice from the taskforce in the short-term. In the medium-term, this measure aims to review the effectiveness of the taskforce and implement the services offered on a further roll-basis.

In the short-term there is potential for positive effects on the SEO for MA at a localised level for the herds on which the taskforce is focused. By addressing bTB outbreaks on a bespoke basis, the taskforce may help to reduce bTB breakdowns and support the continuation or resumption of cattle-related agricultural activities. In the medium to long-term, the implementation and wider roll-out of the taskforce's advice has the potential to deliver further positive effects for MA; it may help to reduce bTB outbreaks and herd breakdowns, improve biosecurity, and lessen the financial impacts associated with cattle health as a result of bTB. There may be slight potential for indirect secondary positive effects in the medium to long-term on PHH, with reduced bTB infection rates among herds leading to reduced potential for TB infection amongst farm workers.

The SEOs for BFF, GSL, W, A, CF, CH and L are scored as neutral as there is not considered to be any pathway for strategic-level positive or negative effects from the implementation of this measure.

Whole Genome Sequencing

This measure aims to work with the Agri Food and Biosciences Institute to expand and use data to understand bTB transmission pathways and support breakdown case management, with the potential for a pilot project to be implemented in the short-term. In the medium-term, this measure aims to integrate whole genome sequencing into case management and epidemiological investigations as well as to review any possible pilot projects. In the long-term, this measure aims to consider any future advances in genetic analysis to allow informed decisions to be made regarding existing and future disease intervention strategies with respect to epidemiological data.

Genome sequencing is used to identify the particular strain of bacterium (TBHub, 2020) and can determine the source of infection, such as whether it has arisen from cattle introduced into a herd or from the local area. It can also help determine whether further herd breakdowns are due to cattle movements or to residual infection remaining within the herd.

Measure	Description of Measure	Potential Outcomes for SEA Topics
In the short to long-term, there is potential for positive effects on MA, through the integration of data to investigate transmission pathways, improve understanding of herd breakdowns, and help address bTB infections within the cattle population. This could reduce the occurrence of bTB outbreaks, as well as the associated slaughter of cattle and/or herd movement restrictions. However, the potential introduction of a pilot project remains uncertain in terms of effects on SEOs, as the measure does not commit to this taking place. There may be slight potential for indirect secondary positive effects in the medium to long-term on PHH, with reduced bTB infection rates among herds leading to reduced potential for TB infection amongst farm workers. The SEOs for BFF, GSL, W, A, CF, CH and L are scored as neutral as there is not considered to be any pathway for strategic-level positive or negative effects from the implementation of this measure. **Legislative powers to test non-bovines for bTB** This measure aims to introduce draft legislation to extend bTB testing to non-bovine animals, including on farms where no cattle are present, in the short-term. In the medium-term, and subject to consultation, the necessary legislative amendments would be taken forward. In the short-term, this measure is likely to have indirect positive effects on MA by improving the detection of bTB in non-bovine animals, supporting better biosecurity, and helping to reduce the spread of disease between farms. However, the medium to long-term effects of this measure on the SEO for MA is uncertain, as the measure does not make clear how bTB-positive non-bovine animals or herd breakdowns would be managed. For example, if slaughter were required, this could have negative effects on MA for other farmers through reduced agricultural productivity and output. The position on compensation for such impacts is also unclear. The SEOs for BFF, GSL, W, A, CF, CH and L are scored as neutral as there is not considered to be any pathway for strategic-level positive or negative effects from the implementation of this measure. **Restrictions and risk-based trading** This measure aims to evaluate options for pre- and post-movement testing, and to develop proposals in the short term to support compliance with legislation and enable informed purchasing, for example through information sharing and mapping. In the medium term, it will review the effectiveness of these proposals and explore further options for sharing information on bTB herd classification. In the long term, it will consider whether additional restrictions may be introduced and assess the effectiveness of the earlier measures. There is potential for both positive and negative effects on the SEO for MA from the implementation of this measure in relation to cattle movements. In the short to long-term, there is potential for indirect positive effects on MA by supporting informed purchasing and reducing the risk of buying cattle infected with bTB. This could help prevent bTB outbreaks, reduce the need for cattle slaughter or movement restrictions, and allow agricultural productivity and outputs associated with cattle to continue. However, in the long-term, there is also the potential for direct negative effects on MA if further restrictions are introduced for herd experiencing bTB breakdowns, resulting in reduced agricultural productivity. The SEOs for BFF, GSL, W, A, CF, CH and L are scored as neutral as there is not considered to be any pathway for strategic-level positive or negative effects from the implementation of this measure. **Herd Health Management and Biosecurity Advice** This measure aims to develop proposals in the short-term for providing biosecurity advice to and from industry, aligning herd health and biosecurity with other DAERA animal health programmes and wider programmes, and implementing a fit-for-purpose biosecurity assessment protocol. In the medium-term, it aims to review the effectiveness of these short-term proposals and consider proposals which will align with other DAERA animal health programmes, wider programmes, and industry priorities. There is potential for positive effects on the SEOs for MA, PHH and BFF from implementation of this measure. In the short to long-term, improvements in biosecurity could have direct positive effects on MA by reducing incidences of bTB infection and herd breakdowns, which would in turn reduce cattle slaughter and herd movement restrictions and help maintain agricultural productivity and outputs associated with cattle as an	

Measure	Description of Measure	Potential Outcomes for SEA Topics
agricultural asset. In the medium to long term, improved biosecurity may also have indirect positive effects on BFF and PHH by reducing the transmission of bTB to wildlife and lowering infection rates in herds, thereby reducing the risk of TB exposure for farm workers. The SEOs of GSL, W, A, CF, CH and L are scored as neutral as there is not considered to be any pathway for strategic-level positive or negative effects from the implementation of this measure. **Capital grants for safe and effective on farm testing facilities and biosecurity improvements** This measure aims to explore options for providing grant aid to improve animal handling and testing facilities, and to undertake works that improve biosecurity, as part of DAERA's wider sustainable agriculture programme in the short-term. In the medium-term, subject to the availability of funding, the scheme would be implemented. In the short-term, there is potential for direct positive effects on MA, as improvements in biosecurity could reduce bTB infections and herd breakdowns, thereby reducing cattle slaughter and movement restrictions and allowing agricultural productivity and outputs associated with cattle as an agricultural asset to continue. However, as it is unclear whether grant aid will be implemented, the potential medium- to long-term effects on the SEOs for BFF, PHH, and MA remain uncertain. The SEOs of GSL, W, A, CF, CH and L are scored as neutral as there is not considered to be any pathway for strategic-level positive or negative effects from the implementation of this measure.		
Cumulative and Synergistic Effects All cattle intervention measures have the potential to deliver cumulative positive effects on the SEO for MA, through improving biosecurity, reducing bTB infection, addressing herd transmission patterns and rates, and reducing herd breakdowns, with benefits for cattle health and cattle as an agricultural asset. The measures relating to Field Surveillance and Testing, Abattoir Surveillance, Interferon Gamma (IFNg) Testing, Criteria for Officially Tuberculosis Free (OTF) Status, Herds with prolonged and recurring breakdowns, legislative powers to test non-bovines for bTB, Herd Health Management and Biosecurity Advice, and Capital grants for safe and effective on farm testing facilities and biosecurity improvements, also have the potential to deliver cumulative positive effects on the SEO for MA, through improvements in biosecurity. In addition, they may have indirect secondary positive effects on the SEO for BFF by reducing the potential for transmission of bTB to wildlife. Through improved biosecurity and reduced bTB infection and herd breakdowns in cattle, these measures may also have cumulative positive effects on the SEO for PHH, by reducing the potential for exposure to bTB, particularly for farm workers, and lowering the risk of infection for the general population.		
SEA Mitigation Measures **Field Surveillance and Testing** It is recommended that an appropriate Standard Operating Procedure (SOP) be produced to provide guidance on the safe handling and transport of samples, including, for example, specifying the required cold storage temperature. It is also recommended that DAERA includes information on the performance assessment process that will be used to review the effectiveness of the enhanced training and monitoring/supervision of tests, including whether this will be based on the number of tests undertaken, compliance information, or veterinary competence testing. **Abattoir Surveillance** It is recommended that an appropriate SOP is produced to provide guidance on abattoir surveillance measures to be undertaken, and that consideration is given to competency checks on abattoir staff to ensure that training has been delivered in an appropriate manner. **Interferon Gamma (IFNg) Testing** It is recommended that an appropriate SOP be produced to set out the process for increased testing numbers, such as a standardised sampling procedure and the use of biohazard control measures. These could include ensuring that samples are sealed in leak-free environments and that staff receive training to minimise contamination risks, such as spill management and disinfection. It is also unclear from the measure whether		

Measure	Description of Measure	Potential Outcomes for SEA Topics
extending the testing window to 24 hours would require the use of cold storage, and the provisions for this should be considered further. It is also recommended that DAERA provide information on the costs associated with increased testing targets, including whether these costs would be met through government-based schemes or by herd owners, given the proposed large increase in testing targets. **Criteria for Officially Tuberculosis Free (OTF) Status** It is recommended that further information is provided by DAERA on how the criteria on OTF status may be altered by this measure, as it is currently unclear whether the criteria surrounding OTF status would become stricter or more relaxed. **Inconclusive Skin Reactors (ICs)** It is recommended that further information is provided by DAERA on how the proposals for managing inconclusive skin reactors may be formulated, as it is currently unclear how these proposals would impact on bTB management. **Full and Partial Depopulations** It is recommended that further information is provided by DAERA on how this measure would affect depopulation and restocking policy, as it is currently unclear what impact these proposals would have on depopulation and restocking arrangements. **Restocking after bTB Breakdown and Application of Severe Breakdown status** It is recommended that DAERA provides further information on how this measure would affect the criteria for bTB restocking and the application of severe breakdown status, as it is currently unclear how the review of these criteria would impact restocking arrangements and the application of a severe breakdown status. **Herds with prolonged and recurring breakdowns** It is recommended that DAERA provides further information on the proposed pilot scheme, such as its spatial and temporal scope, and the criteria that would be used to determine which herds qualify as having prolonged and recurring breakdowns. It is also recommended that further information be provided on the composition of the taskforce, the interventions and advice that may be used, and the criteria that would be applied to assess the effectiveness of the pilot. **Whole Genome Sequencing** It is recommended that DAERA provides further information on the pilot project, as it is not currently committed to. This could include details of its spatial and temporal scope, as the effects of the measure currently remain uncertain. **Legislative powers to test non-bovines for bTB** It is recommended that DAERA provides further information on which non-bovine species this measure may be applied to, and whether the legislation would be limited to farms contiguous to bovine farms. This may be important as bTB has also been found in non-livestock species, such as cats and dogs. Further information should also be provided on the possible actions to be taken if bTB is detected in non-bovine animals, e.g., whether slaughter, biosecurity measures such as premises disinfection, or movement restrictions could be required. **Restrictions and risk-based trading** It is recommended that DAERA provides further information on the potential alterations to pre- and post-movement testing, and how these may affect bTB management for cattle herd owners. Information should also be provided on how information sharing will be undertaken, including the format this would take and how data confidentiality would be ensured. **Herd Health Management and Biosecurity Advice** It is recommended that DAERA provides information on its animal health programmes, and wider programmes, which would be used to align biosecurity measures for bTB control. It is also recommended that information is provided on the biosecurity assessment protocol to be implemented, such as the information required on biological agents, data, and equipment.		

Measure	Description of Measure	Potential Outcomes for SEA Topics
Capital grants for safe and effective on farm testing facilities and biosecurity improvements		
It is recommended that DAERA provides further information on the grant aid and how this may extend toward testing facilities and biosecurity improvements. It is also recommended that DAERA makes a clear commitment to the grant aid, as its implementation remains uncertain.		

Table 7-2: Assessment of Blueprint measures under the Sub-Theme of Wildlife

Measure	Description of Measure	Potential Outcomes for SEA Topics								
Wildlife										
Wildlife Intervention	*Short-term:* Bring forward proposals for effective, evidence based wildlife interventions and TBPSG views for consideration by Minister. Consult on proposals as agreed by the Minister and taking into account requirements from the judicial review decision of October 2023. Following Ministerial consideration, progress any possible necessary legislation to give effect to preferred approach and commence implementation. *Medium-term:* Continue to implement and operationalise any agreed measures. *Long-term:* Continue to implement and operationalise any agreed measures.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		-	+/-	0	0	-	0	+	0	0
Badger RTA Survey	*Short-term:* Develop strategies and policies to optimise use of data arising from badger RTA survey to enable evidence-based decision making. *Medium-term:* Implement any agreed policy.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		0	0	0	0	0	0	0	0	0
Badger Sett App	*Short-term:* Develop and launch a secure, user-friendly App that enables farmers and the public to record badger setts.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		0	0	0	0	0	0	0	0	0
Role of Deer	*Short-term:* Develop proposals to evaluate further the role of deer in the transmission and persistence of bTB. *Medium-term:* Consider and agree proposals and commence preparation for implementation.	BFF	PHH	GSL	W	A	CF	MA	CH	L
		0	0	0	0	0	0	0	0	0

Measure	Description of Measure	Potential Outcomes for SEA Topics

These measures aim to reduce the occurrence of exchanges in infection of *M. bovis* between cattle and wildlife, particularly badgers, by addressing the reservoir of *M. bovis* infection. If effectively implemented, they should have positive implications for the environment compared with the baseline scenario, in which no such protections are in place, with respect to the SEO for MA.

Wildlife Intervention

This measure outlines that, in the short-term, proposals for wildlife intervention options will be brought forward, with consultation taking place alongside the introduction of the necessary legislation to commence implementation of the preferred approach. In the medium and long-term, the measure will involve the continued implementation and operation of any agreed wildlife intervention options.

As the Blueprint does not provide further detail on the specific nature of the wildlife intervention options, the SEO scoring set out below is based on the information contained in 'Consultation on the Department's Potential Wildlife Intervention Options for the control of Bovine Tuberculosis in Northern Ireland' which is detailed further in **Section 7.2**.

The implementation of the potential wildlife intervention options has the potential for short, medium and long term direct negative effects on BFF through the culling of badgers, whether by shooting alone or through TVR methods. These effects on BFF are likely to be greater if the shooting-only is implemented, as this would involve the widespread culling of around 70% of the local badger population, including healthy badgers that are not infected with bTB. Badgers are a protected species under the Bern Convention and NI legislation. The measure does not clearly specify when culling would end in the long-term, which creates the potential for prolonged long-term negative effects on badger populations. There is also potential for secondary indirect negative medium to long-term effects on BFF due to the loss of badger populations and the associated ecological impacts, given the species' role in promoting habitat heterogeneity and biodiversity (Badger Trust, 2024).

The implementation of the potential wildlife intervention options has potential for short to long-term direct negative effects on the SEO for A through the use of shooting as a culling method, which would introduce noise emissions. The measure does not clearly specify when culling would end in relation to the use of shooting, creating the potential for prolonged noise impacts. There is also potential for indirect negative effects on the SEO for BFF, as noise from shooting could disturb other species within the intervention areas. Depending on the timing of culling by shooting, this may impact on breeding and feeding patterns, with possible negative effects on designated sites within the proposed intervention areas, including migratory species and those that are qualifying interest features of those sites.

There is potential for short to long-term direct negative effects on the SEO for PHH arising from the use of shooting as a culling method and the associated noise disturbance to local populations within the intervention areas. The measure does not clearly specify when culling would end in relation to shooting, which creates the potential for prolonged noise impacts. There is also potential for negative effects on PHH if accidental discharge were to result in damage to property or injury or death to persons. Appropriate health and safety measures would therefore be required. DAERA notes that this would include training, marksmanship standards, equipment, and operating distances.

There is potential for medium to long-term secondary indirect positive effects on the SEO for PHH through the implementation of wildlife intervention options, which aim to address the reservoir of infection present within wildlife. By reducing bTB incidence, these measures may reduce the risk of infection for farm workers and the general population.

There is potential for medium to long-term secondary indirect positive effects on the SEO for MA through reduced potential for transmission of *M. bovis* between badgers and cattle, arising from the implementation of wildlife intervention options to address the reservoir of infection present within wildlife. This could reduce bTB infections and herd breakdowns, as well as reduce cattle losses through slaughter or movement restrictions, supporting cattle as an agricultural asset.

The SEOs of GSL, W, CF, CH and L are assessed as neutral as there is not considered to be any pathway for strategic-level effects from the implementation of this measure.

Measure	Description of Measure	Potential Outcomes for SEA Topics
Badger RTA Survey This measure aims to develop strategies and policies to optimise the use of data from badger road traffic accident surveys, with the aim of supporting evidence-based decision making in the short-term. In the medium-term it would involve implementing any agreed policy. However, it is unclear from the wording of the measure how the data would be used, so its potential effects on SEOs is uncertain. it is, therefore, assessed as neutral across the SEOs for BFF, PHH, A and MA. The SEOs for GSL, W, CF, CH and L are also assessed as neutral, as there is not considered to be any pathway for strategic-level effects from the implementation of this measure. **Badger Sett App** This measure aims to develop and launch a secure, user-friendly app that allows farmers and members of the public to record badger setts. However, it is unclear from the wording of the measure how the data would be used, so its potential effects on the SEOs is uncertain. It is therefore assessed as neutral for the SEOs for BFF, PHH, A and MA. The SEOs for GSL, W, CF, CH and L are also assessed as neutral, as there is not considered to be any pathway for strategic-level effects from the implementation of this measure. It should be noted, however, that if badger sett locations were made publicly available, or were to become available through a data breach or leak, this could have negative effects on BFF, particularly if the information were used to support illegal activities such as badger baiting. **Role of Deer** This measure aims to develop proposals to further evaluate the role of deer in contributing to the transmission and persistence of bTB in the short-term. In the medium-term, it seeks to consider and agree those proposals, and to commence preparations for implementation of any resulting measures. It is unclear from the wording of the measure how it would be used, so its potential effects on the SEOs is uncertain. It is therefore assessed as neutral for BFF, PHH, A and MA. The SEOs for GSL, W, CF, CH and L are also assessed as neutral, as there is not considered to be any pathway for strategic-level effects from the implementation of this measure. However, if the measure were to involve culling, it could have negative effects on BFF. Conversely, addressing deer as a potential reservoir of *M. bovis* may have indirect positive effects on MA by reducing infection risk for cattle herds.		
Cumulative and Synergistic Effects In-combination with the cattle intervention measures, the implementation of the wildlife intervention methods has the potential for positive effects on the SEO of MA through reduced disease reservoir of *M. bovis* from wildlife, with improved biosecurity and reduced risk of bTB spread, with fewer bTB infections and herd breakdowns within cattle as an agricultural asset. In-combination with the cattle intervention measures, there is potential for indirect positive effects on BFF in the medium to long-term through addressing the reservoir of *M. bovis* present through the wildlife intervention methods and from improved biosecurity. In-combination with the cattle intervention measures, there is potential for cumulative indirect positive effects on PHH through addressing the addressing the reservoir of *M. bovis* present through the wildlife intervention methods and from improved biosecurity with fewer bTB infections within cattle herds, reducing the potential risk of potential infection for farm workers and local populations.		
SEA Mitigation Measures **Wildlife Intervention** There is potential for negative impacts on BFF and the local badger population from the introduction of potential wildlife intervention options. If culling by shooting is to be used to remove 70% of the population, the information currently available does not explain how this target will be determined or monitored. It is noted that culling may be followed by vaccination as an exit strategy, potentially after an initial five-year intervention		

Measure	Description of Measure	Potential Outcomes for SEA Topics
period, although this would depend on the local disease situation and whether intervention continues. Further information should therefore be provided on how interim monitoring and review will ensure that culling does not have adverse long-term effects on badger population viability within the intervention area. Further information should be provided on the location of the traps, and whether these may be located in exposed areas where trapped animals could be subject to adverse weather conditions Information should be provided regarding how designated sites present within intervention areas will be accessed and if an exclusion zone around these sites may be implemented to prevent disturbance to species and habitats within these areas. Any zone of influence or exclusion should consider the species present within the designated site and their respective sensitivities to the implementation of the proposed wildlife intervention options. Further information should also be given regarding the disposal of any culled badgers and how the culled badger carcasses will be transported and disposed of should the badger possess bTB, to prevent cross-contamination and infection occurring. **Badger RTA Survey** It is recommended that DAERA provides further information on the potential strategies and policies which may be used to optimise the use of data from badger RTA surveys as it is presently unclear from the measure how this information will be used. **Badger Sett App** It is recommended that DAERA provides further information on how publicly recorded data on the location of badger setts will be kept secure as should data become publicly available on the location of badger setts, or potentially become available e.g. through a data breach or leak that this may result in negative effects on badgers through sett locations being used for illegal activities such as badger baiting with ethical and welfare issues arising. **Role of Deer** It is recommended that DAERA provides further information regarding the proposals on the management of deer as it is presently unclear from the measure how this may be used to address tuberculosis as to whether this may involve vaccination and/or culling measures as part of a strategy approach.		

7.2 Assessment of measures within the Potential Wildlife Intervention Options

Further detail on the potential Wildlife Intervention Options identified in the DAERA consultation paper 'Consultation on the Department's Potential Wildlife Intervention Options for the control of Bovine Tuberculosis in Northern Ireland' is set out below. This section provides additional information on the potential options that may be considered as part of the potential wildlife intervention measures for bTB control.

As noted in **Section 2**, the delivery and funding arrangements for these options are expected to be either industry-led through private companies or delivered by farmer-led not for profit organisations. In both cases, As DAERA would retain an oversight role to ensure that implementation of the intervention occurs in line with the required protocols and standards, monitoring performance and ensuring best practice is adhered to. On this basis, it is considered that the options would be implemented to the same standards regarding welfare and deployment methods.

Table 7-3: Assessment of Wildlife Intervention Options

Measure	Description of Measure	Potential Outcomes for SEA Topics								
Wildlife Intervention										
Non-Selective Culling:	Culling involves the non-selective removal of badgers by shooting within an identified intervention area of at least 100km^2. This approach aims to decrease the overall infection burden in the badger population through population reduction, with the intention of lowering the incidence of bTB in cattle. This may involve decreasing the local badger population within the intervention area by up to 70%. There is no testing of badgers prior to culling, and all individuals are subject to removal, irrespective of infection status.	BFF	PHH	GSL	W	A	CF	MA	CH	L
Non-Selective Culling using controlled shooting of free roaming badgers (supplemented by cage trapping)	This intervention approach is detailed in **Section 2.7.2.4.1.**	-	+/-	0	0	-	0	+	0	0
Non-Selective Culling using cage trapping.	This intervention approach is detailed in **Section 2.7.2.4.2.**	-	+/-	0	0	-	0	+	0	0
Non-selective culling using stopped restraints.	This intervention approach is detailed in **Section 2.7.2.4.3.**	-	+/-	0	0	-	0	+	0	0
Test and Vaccinate or Remove:	The Test and Vaccinate or Remove (TVR) approach involves the live capture of badgers within an intervention area of at least 100km^2. The TVR method removes individual badgers that have tested positive to the trap side test from within the population while simultaneously promoting herd immunity among the remaining badgers through vaccination with the BCG vaccine. This dual approach aims to reduce future disease transmission and improve the health and immunity of the badger population within the intervention area. Once captured, badgers are anaesthetised to enable a blood sample to be safely obtained. This sample is then tested for bTB using a trap-side diagnostic tool, the DPP test. The test provides results within 20 minutes and has an estimated whole blood sensitivity of 70%, specificity of 97% (Arnold et al., 2021). Badgers that test negative for bTB are vaccinated and released back into their habitat. In contrast, badgers that test positive for bTB are humanely culled through lethal injection.	BFF	PHH	GSL	W	A	CF	MA	CH	L
TVR using baited cages.	This intervention approach is detailed in **Section 2.7.2.5.1.**	+/-	+/-	0	0	0	0	+	0	0

Measure	Description of Measure	Potential Outcomes for SEA Topics								
TVR using stopped restraints. This intervention approach is detailed in **Section 2.7.2.5.2.**		+/-	+/-	0	0	0	0	+	0	0
Vaccination Only: A vaccination only approach relies exclusively on vaccination as the mechanism for reducing disease transmission and does not include any lethal measures. Under this approach, all badgers that are captured within the intervention area are vaccinated without any testing taking place and are subsequently released back into the local environment. As a result, both uninfected and potentially infected badgers remain within the population following capture, vaccination and release.		BFF	PHH	GSL	W	A	CF	MA	CH	L
Vaccination Only using baited cages. This intervention approach is detailed in **Section 2.7.2.6.1**.		+/-	+	0	0	0	0	+	0	0
Vaccination Only using stopped restraints. This intervention approach is detailed in **Section 2.7.2.6.2**.		+/-	+	0	0	0	0	+	0	0
Lay Vaccinators		BFF	PHH	GSL	W	A	CF	MA	CH	L
Vaccinating badgers is one of the potential tools available to help reduce the spread of bTB. This proposal is detailed in **Section 2.7.2.9**.		0	0	0	0	0	0	0	0	0

These measures aim to reduce the transmission of *M. bovis* between cattle and wildlife, particularly badgers, by addressing the existing reservoir of infection. If effectively implemented, they are expected to have positive environment effects compared with the baseline scenario, in relation to the SEO for MA, where no such protection is in place.

Non-Selective Culling

This wildlife intervention option involves the non-selective culling of up to 70% of badgers within an intervention area. This may be carried out using the following methods:

- Controlled shooting of free-roaming badgers, supplemented by cage trapping and shooting, where required;
- Shooting following capture by cage trapping; or
- Shooting following capture using stopped restraints.

The implementation of non-selective culling has the potential for short, medium and long-term direct negative effects on BFF through the culling of badgers by shooting, via controlled shooting of free-roaming badgers, or shooting of badgers that have been captured using cages or stopped restraints. There is potential for direct negative effects on BFF, as this approach could involve the removal of up to 70% of the local badger population, including healthy badgers that are not infected with bTB, while the use of cages and stopped restraints for trapping also raises welfare concerns. Badgers are a protected species under the Bern Convention and Northern Ireland legislation. The measure does not clearly specify when culling would end in the long-term, which creates the potential for long-term negative effects on badger populations. There is also potential for secondary indirect negative medium to long-term effects on BFF due to the ecological consequences of losing badger populations, given the species' role in supporting habitat heterogeneity and biodiversity (Badger Trust, 2024).

Measure	Description of Measure	Potential Outcomes for SEA Topics
The implementation of culling has potential for short to long-term direct negative effects on the SEO for A through the use of shooting as a culling method, which would generate noise pollution. The measure does not clearly specify when culling would end in relation to shooting, creating the potential for prolonged noise impacts. There is also potential for indirect negative effects on the SEO for BFF, as noise from shooting could disturb other species within the intervention areas. Depending on the timing of culling, this may affect breeding and feeding behaviour, with potential for negative effects on designated sites within the proposed intervention areas, including migratory species and species that are qualifying interest features of those sites. There is potential for short to long-term direct negative effects on the SEO for PHH arising from the use of shooting as a culling method and the associated noise disturbance to local populations within the intervention areas. The measure does not clearly specify when culling would end in relation to shooting, which creates the potential for long-term noise impacts. There is also potential for negative effects on PHH if accidental discharge were to result in damage to property or injury or death to persons. Appropriate health and safety measures would therefore be required. There is potential for medium to long-term secondary indirect positive effects on the SEO for PHH through the implementation of non-selective culling to address the reservoir of infection present within wildlife. By reducing TB incidence, this may reduce the risk of infection for farm workers and the general population. There is potential for medium to long-term secondary indirect positive effects on the SEO for MA through reduced potential for transmission of *M. bovis* between badgers and cattle, arising from non-selective culling to address the wildlife reservoir of infection. This could reduce bTB infections and herd breakdowns, and reduce cattle losses through slaughter or movement restrictions, supporting cattle as an agricultural asset. The SEOs of GSL, W, CF, CH and L are assessed as neutral as there is not considered to be any pathway for strategic-level effects from the implementation of this measure. **Test and Vaccinate or Remove** This wildlife intervention option involves trapping badgers within an intervention area, after which they are anesthetised and blood-tested for bTB using the sett-side Dual Platform test. Badgers that test negative are vaccinated, microchipped and released, while those that test positive are culled. Trapping may be carried out using either baited cages or stopped restraints. Trained lay persons may trap the badgers, but anaesthetisation, testing, vaccination, microchipping and euthanasia by lethal injection will be carried out by a veterinary surgeon. The implementation of this option has potential for both positive and negative effects on BFF. There is potential for direct negative effects on BFF through the culling of badgers that test positive for bTB, while the use of cage trapping or stopped restraints raises welfare concerns. There is also the potential for accidental by-catch of other species. Badgers are a protected species under the Bern Convention and Northern Ireland legislation. The measure does not clearly specify when the TVR approach would end, which creates the potential for prolonged negative effects on badger populations if culling of bTB-infected badgers continues indefinitely. There is also potential for secondary indirect negative effects on BFF in the medium to long term due to the loss of badger populations and the associated ecological impacts, given the species' role in promoting habitat heterogeneity and biodiversity (Badger Trust, 2024). The measure estimates that approximately 55% of the local badger population will be trapped in the first year; however, as the intervention areas will be selected on a bespoke basis, it is unclear what proportion of the badger population may be infected with bTB and therefore subject to trapping and culling. There is also potential for direct positive effects on BFF through the vaccination of badgers that test negative for bTB, which would help address the wildlife reservoir of *M. bovis* and improve long-term badger health. As badgers would be culled by lethal injection, this option is expected to have neutral effects on the SEO for A in relation to noise disturbance, as no shooting is involved. There is potential for medium to long-term secondary indirect positive effects on the SEO for PHH through the implementation of TVR to address the reservoir of infection present within wildlife. By reducing bTB incidence, this may reduce the risk of infection for farm workers and the general population. The TVR approach also facilitates the monitoring of disease prevalence within the badger population and as a result the impact of th intervention.		

Measure	Description of Measure	Potential Outcomes for SEA Topics
There is potential for medium to long-term secondary indirect positive effects on the SEO for MA through reduced transmission of *M. bovis* between badgers and cattle, arising from the implementation of TVR to address the wildlife reservoir of infection. This could reduce bTB infections and herd breakdowns, and lessen cattle losses through slaughter or movement restrictions, supporting cattle as an agricultural asset. The SEOs of GSL, W, CF, CH and L are assessed as neutral as there is not considered to be any pathway for strategic-level effects from the implementation of this measure. **Vaccination Only** This wildlife intervention option involves the trapping and vaccination of badgers within the intervention area, with no culling taking place. Trapping may be carried out using either cage traps or stopped restraints. The implementation of the vaccination-only option has the potential for both positive and negative effects on the SEO for BFF. There is potential for direct negative effects on BFF through the use of cage trapping or stopped restraints, which may cause short-term welfare impacts. There is also the potential for accidental by-catch of other species. Badgers are a protected species under the Bern Convention and Northern Ireland legislation. The potential for negative effects on BFF is expected to be lower for the vaccination-only option, as the badger population within intervention areas would not be reduced. However, there is also potential for direct positive effects on BFF through the vaccination of badgers, which would help address the wildlife reservoir of *M. bovis* and improve long-term badger health. There is potential for long-term secondary indirect positive effects on the SEO for PHH through vaccination, as reducing TB incidence in wildlife may reduce the risk of infection for farm workers and the general population. There is also potential for long-term secondary indirect positive effects on the SEO for MA through reduced transmission of *M. bovis* between badgers and cattle. By addressing the wildlife reservoir of infection, vaccination may reduce bTB infections and herd breakdowns, and in turn reduce cattle losses through slaughter or movement restrictions, supporting cattle as an agricultural asset. There are neutral effects on the SEO for A, as this option does not involve culling or the use of shooting, and therefore would not introduce noise from shooting. The SEOs of GSL, W, CF, CH and L are assessed as neutral as there is not considered to be any pathway for strategic-level effects from the implementation of this measure. **Lay-Vaccinators** This proposal outlines DAERA's intention to seek an amendment to The Veterinary Surgery (Vaccination of Badgers against Tuberculosis) Order 2010, to permit trained lay persons who have completed an approved training course to trap badgers and administer an authorised BCG vaccine under veterinary prescription and clinical direction. This proposal is not expected to have any direct or indirect effects on the SEOs for BFF, PHH, MA or A. However, it may help support the wider delivery and implementation of any badger vaccination programmes and is therefore assessed as neutral. The SEOs of GSL, W, CF, CH and L are also scored as neutral as there is not considered to be any pathway for strategic-level effects from the implementation of this measure.		
Cumulative and Synergistic Effects In-combination with the cattle intervention measures, the implementation of the three potential wildlife intervention methods has the potential for positive effects on the SEO for MA by reducing the wildlife reservoir of *M. bovis*, improving biosecurity, and reducing the risk of bTB spread. This could result in fewer bTB infections and herd breakdowns within cattle as an agricultural asset. It should be noted that the timeframe for achieving these positive effects would be longer where vaccination alone is used.		

Measure	Description of Measure	Potential Outcomes for SEA Topics
In-combination with the cattle intervention measures, the wildlife intervention methods also have the potential for indirect positive effects on BFF in the medium to long-term by addressing the existing reservoir of *M. bovis* in wildlife, alongside improvements in biosecurity from the cattle intervention measures. Similarly, there is potential for cumulative indirect positive effects on PHH through reduced *M. bovis* reservoirs in wildlife and improved biosecurity, which may lead to fewer bTB infections in cattle herds and a reduced risk of exposure for farm workers and local populations.		
SEA Mitigation Measures **Non-selective Culling Approaches** There is potential for negative impacts on BFF and the local badger population from the introduction of potential wildlife intervention options. If non-selective culling by shooting is used to reduce the badger population by 70%, further information should be provided on how interim monitoring and review will ensure that culling does not have negative population consequences for the long-term persistence of badgers within the intervention area, or any wider ecological implications. Further information should be provided on the location of the traps, including cage traps and stopped restraints, and whether these may be located in exposed areas where trapped animals could be subject to adverse weather conditions. Further information should be provided on who will be responsible for carrying out the wildlife intervention methods, with the use of culling via shooting, information on the specific training received by those undertaking the intervention methods should be given. Overall monitoring of the welfare implications of the non-selective culling is also recommended such as an overseeing veterinary surgeon to ensure no undue suffering occurs. Information should also be provided on the health and safety measures that will be taken during shooting to ensure that no accidental discharge occurs to property or persons. Information should be provided regarding how designated sites present within intervention areas will be accessed and if an exclusion zone around these sites may be implemented to prevent disturbance to species and habitats within these areas. Any zone of influence or exclusion should consider the species present within the designated site and their respective sensitivities to the implementation of the proposed wildlife intervention options. Further information should also be given regarding the disposal of any culled badgers and how the culled badger carcasses will be transported and disposed of should the badger possess bTB, to prevent cross contamination and infection occurring. **Test and Vaccinate or Remove Approaches** There is potential for negative impacts on BFF and local badger population from the introduction of potential wildlife intervention options. Information should be provided on how the badgers will be anesthetised, for example by injection or other means, and how any test-negative badgers will be monitored to ensure that they recover from anaesthesia before being released back into the wild. This should also include the steps that will be taken should an anaesthetised badger show adverse effects e.g. recovery time allowed and any veterinary intervention that may be required. Further information should be provided on the location of the traps, including cage traps and stopped restraints, and whether these may be located in exposed areas where trapped animals could be subject to adverse weather conditions. Further information should also be provided on the proportion of the badger population within the intervention area that may be vaccinated or culled. The potential effects of culling on badger population dynamics and the long-term survival of the population within the area are currently unclear. Monitoring is therefore recommended to determine culling rates and assess how these may affect population viability. Information should be provided regarding how designated sites present within intervention areas will be accessed and if an exclusion zone around these sites may be implemented to prevent disturbance to species and habitats within these areas. Any zone of influence or exclusion should consider the species present within		

Measure	Description of Measure	Potential Outcomes for SEA Topics
the designated site and their respective sensitivities to the implementation of the proposed wildlife intervention options. Further information should also be given regarding the disposal of any culled badgers and how the culled badger carcasses will be transported and disposed of should the badger possess bTB, to prevent cross contamination and infection occurring. **Vaccination Only Approaches** There is potential for negative effects on BFF on badger welfare from the deployment of cage trapping or stopped restraints to facilitate vaccination. Further information should be provided on the location of the traps, including cage traps and stopped restraints, and whether these may be located in exposed areas where trapped animals could be subject to adverse weather conditions. It is recommended that information is provided on the proportion of the local badger population that would need to be vaccinated in order to achieve the aims of the programme, as well as the likely timescales involved in implementing this potential wildlife intervention option. This should include how long cage traps or stopped restraints may need to be deployed, given the potential for other species to become accidentally trapped by these methods. **Lay Vaccinators** As this proposal has been assessed as neutral on the SEO topics, no specific mitigation measures are recommended.		

7.3 Cumulative, Synergistic and Inter-relationship of Effects

At the Plan level, the potential for cumulative or synergistic effects on the environment may arise in the following instances:

- Interaction of the proposed measures with each other; and
- Interaction of measures with policies or proposals in related plans or programmes.

7.3.1 Interaction of the Proposed Measures within the Plan

The proposed measures of the Plan aim to address bTB through measures focused on cattle intervention, and wildlife intervention. These measures have the potential for positive cumulative and synergistic effects for the environment, with limited capacity for conflict. The cumulative and synergistic effects on SEOs that are anticipated between the proposed measures are detailed in **Table 7-4**.

Table 7-4: Cumulative / Synergistic Interactions between proposed measures of the Plan

Measure	Cumulative / Synergistic Effects
All Cattle Intervention Measures	All cattle intervention measures have the potential for cumulative positive effects on the SEO for MA, through improved biosecurity, reduced bTB infection, addressing herd transmission patterns and rates, and reducing herd breakdowns. This would benefit cattle health and support cattle as an agricultural asset. By improving biosecurity and reducing bTB infection and herd breakdowns in cattle, these measures may also have the potential for cumulative positive effects on the SEO for PHH, by reducing the potential for exposure to bTB among farm workers and lowering the risk of infection to the general population.
Field Surveillance and Testing, Abattoir Surveillance, Interferon Gamma (IFNg) Testing, Criteria for Officially Tuberculosis Free (OTF) Status, Herds with prolonged and recurring breakdowns, legislative powers to test non-bovines for bTB, Herd Health Management and Biosecurity Advice, and Capital grants for safe and effective on farm testing facilities and biosecurity improvements	These measures have the potential for cumulative positive effects on the SEO for MA through improved biosecurity, as well as for indirect secondary positive effects on the SEO for BFF by reducing the potential for transmission of TB to wildlife.
All Wildlife Intervention Measures with all Cattle Intervention Measures	In-combination with the cattle intervention measures, the implementation of wildlife intervention methods has the potential for positive effects on the SEO for MA by reducing the wildlife reservoir of *M. bovis*, with improved biosecurity and reduced risk of bTB spread, leading to fewer bTB infections and herd breakdowns in cattle as an agricultural asset. In-combination with the cattle intervention measures, there is potential for indirect positive effects on BFF in the medium to long-term by addressing the wildlife reservoir of *M. bovis* through the wildlife intervention methods, and from improved biosecurity. In-combination with the cattle intervention measures, there is potential for cumulative indirect positive effects on PHH by addressing the wildlife reservoir of *M. bovis* through the wildlife intervention methods and from improved biosecurity, with fewer bTB infections in cattle herds, reducing the potential for exposure to bTB among farm workers and lowering the risk of infection to the general population.

7.3.2 Interaction of measures with policies or proposals in related plans or programmes

There are several key international regulations which the Plan should have regard for, and which may have the potential to result in cumulative impacts (both positive and negative) on the receiving environment with the implementation of the Plan.

The potential wildlife intervention options must have regard for the international biodiversity legislation of the Bern Convention (Convention on European Wildlife and Natural Habitats) (1982), under which badgers are listed as an Annex III species. This means that actions must be taken to ensure that the badger populations are not endangered or seriously disturbed, including at a local level. Although the proposed intervention options would have negative effects on badger populations and therefore on BFF, they may still be permissible under the Bern Convention, provided that appropriate monitoring is undertaken to demonstrate compliance with Article 7 and to ensure that the local badger population is not placed at risk.

The Environmental Noise Directive [2002/49/EC] is EU legislation on the assessment and management of environmental noise, with the aim of avoiding, preventing or reducing harmful effects arising on human health. The use of shooting as a wildlife intervention method of culling should therefore have regard for this Directive, given the noise this activity may generate and the potential for negative effects due to disturbance of local populations within the intervention area. As badger culling activities are likely to take place at night, they may disturb receptors during this period, impacting on sleep quality and potentially leading to negative health effects.

The proposed measures of the Plan should have regard for the international regulations of the Animal Health Law [Regulation (EU) 2016/429] and the Commission Delegated Regulation supplementing the Animal Health Law Regulation [(EU) 2020/689) for Tuberculosis control to ensure that bovine animals must fulfil the animal health requirements laid down in these Regulations. The proposed measures of the Plan aim to progress towards good animal health for bovines, therefore there is no risk of adverse in-combination effects with the Plan.

There are also national regulations which the Plan should have regard for, and which may have the potential to result in cumulative impacts (both positive and negative) on the receiving environment with the implementation of the Plan.

In Northern Ireland, badgers and their setts are protected under the Wildlife Order (Northern Ireland) 1985 (listed as a protected species under Schedule 5), as amended. Under this legislation, it is a criminal offence to harm or disturb these animals, obstruct access to their place or refuge or to destroy or damage anything which conceals or provides protection to their place of refuge. Unless suitable legislation or amendments to the existing legislation are made, the implementation of the Plan with respect to the potential wildlife intervention options will contravene this legislation, with negative effects on BFF through badger culling and from actions of disturbance on badgers through trapping to enable vaccination to take place.

The Environmental Protection (Restriction on Use of Lead Shot) Regulations (NI) 2009 restricts the use of lead shot for the purpose of shooting with a shot gun on or over wetlands. The introduction of the potential wildlife intervention options, which may include culling, should consider the location of wetlands within any of the proposed intervention areas to ensure that these activities do not contravene these Regulations.

The Northern Ireland Food Strategy Framework aims to transform the Northern Ireland food system into an innovative one which enhances natural resources and provides safe, nutritionally balanced, accessible food for all. The Plan aims to reduce bTB infections amongst cattle herds, improving food safety and reducing potential risks of bTB infections from animal products sourced from cattle. However, it should be noted that DEFRA has stated that the Food Standards Agency has confirmed that there are no known cases of TB infection from eating infected meat, as the meat from cattle slaughtered due to bTB undergoes rigorous food safety checks regarding the number of lesions present (TB Free England, 2026). The proposed measures of the Plan aim to progress towards good animal health for bovines, therefore there is no risk of adverse in-combination effects with the Plan.

The legislation for the control of TB in Northern Ireland is the Tuberculosis Control Order (Northern Ireland) 1999. As the implementation of the Plan aims to reduce bTB infection through improvements in cattle health, biosecurity, addressing the reservoir of infection present within wildlife, and financial considerations, there is potential for cumulative positive impacts with the successful implementation of the Plan’s measures.

The Environmental Noise Regulations (Northern Ireland) 2006 as amended by Environmental Noise (Amendment) Regulations (Northern Ireland) 2018 determine the noise exposure of the population through strategic noise maps at five-yearly intervals. DAERA has general policy responsibilities for managing environmental noise. This led to the publishing of the Noise Policy Statement for Northern Ireland, which outlined the avoidance, mitigation and minimisation of adverse impacts on human health and quality of life which arise from noise. Consideration should be given to the location of the strategic noise map areas with regard to the proposed intervention areas for the potential wildlife intervention options should the action of culling through shooting with potential noise generation during nighttime coincide with these areas and disturb receptors during

typical sleeping periods. The Pollution Control and Local Government (NI) Order 1978 provides local councils with the power to regulate noise pollution under the Clean Neighbourhood and Environment Act (NI) 2011 through serving Noise Abatement Notices and where noisy work should be avoided between the hours of 11pm and 7am. Noise limits for outdoor equipment are provided by Noise Emission in the Environment by Equipment for use Outdoors (Amendment) (Northern Ireland) Regulations 2025. The use of shooting as a culling method, if introduced, should have consideration for the limits established by these Regulations.

Consideration should also be given to the Bovine TB Action Plan in place as national regulations within the Republic of Ireland. The Plan should have regard for this, and the potential for actions to result in cumulative impacts (both positive and negative) on the receiving environment with the implementation of the Plan. The Bovine TB Action Plan aims to address bTB in the Republic of Ireland through implementing actions such as targeting bTB infections within herds, addressing the impact of wildlife on the spread of bTB, and improving biosecurity measures. There is potential for positive cumulative effects on MA with the implementation of the Plan through addressing bTB infection across the island of Ireland with respect to wildlife reservoir of infection present and from improved cattle biosecurity. However, there is potential for negative cumulative effects on BFF through use of badger culling should potential wildlife intervention options implemented under the Plan include culling, and consideration should be given to badger population dynamics and impacts on ecology within cross border intervention areas.

Section 4 and **Appendix B** outline other relevant plans, programmes, and legislation that could have cumulative effects with the programme of measures proposed for the Plan.

8 Mitigation and Monitoring

8.1 Iterative Development of the Plan and the SEA

The iterative development of the Plan involved the consideration of the measures included in the previous Bovine Tuberculosis Eradication Strategy for Northern Ireland, which was published by DAERA in 2022, with a review of the approach on the eradication and control of bTB undertaken by the CVO. The development of the plan has also considered the previous wildlife intervention element of the Eradication Strategy, which was subject to judicial review in 2022, and which was overturned in 2023. In response to this a new stakeholder group, the TBPSG, was formed in 2025 with the vision to introduce transformative, effective and evidence based solutions to address bTB. In April 2025, the TBPSG produced the Bovine TB in Northern Ireland: Blueprint for Eradication, taking into account the CVO's review of bTB within Northern Ireland, and building upon the DAERA Bovine Tuberculosis Eradication Strategy for Northern Ireland 2022.

The proposed potential wildlife intervention options have been developed based on the Department's view of what are viable, evidence-based and science-informed options that could make a significant and positive impact on disease levels. This has involved input from NIEA, VSAHG and the Department's Chief Scientific Adviser.

The SEA team has provided feedback to DAERA where the potential for adverse environmental effects was identified, and recommended omissions and changes to strengthen measures. Many of these recommendations have been applied by DAERA.

8.2 SEA Mitigation

The outcomes of the assessment of the Plan are provided in **Section 7.1** and **Section 7.2**. It is an overarching aim of the Plan to develop measures that support eradication of bTB by addressing the three pillars of people, cattle and wildlife. Overall, the proposed measures are expected to have positive effects on the SEO for MA by improving biosecurity, reducing bTB outbreaks, and improving cattle health. This should lead to fewer infections, fewer herd breakdowns and fewer cattle needing to be culled, thereby protecting cattle as an agricultural asset. The Plan may also have indirect positive effects on PHH by reducing the risk of bTB exposure from cattle and/or wildlife sources.

However, the introduction of the potential wildlife intervention options may have negative effects on the SEO for BFF, due to the culling of, and disturbance to, badger populations within the intervention areas. A series of SEA mitigation measures are recommended to address the negative or uncertain effects identified in the assessment of the Plan; these are set out in **Section 8.2.1** for the Blueprint and **Section 8.2.2** for the potential Wildlife Intervention Options.

8.2.1 Recommended amendments to the proposed measures of the Blueprint

An assessment of the proposed measures of the Plan as detailed within the Blueprint is provided in **Section 7.1**. Mitigation measures have been recommended where the potential for negative or uncertain effects on the SEOs from the implementation of these measures has been identified. These mitigation measures aim to prevent, reduce, and as fully as possible offset negative or uncertain effects on the environment that have been identified from the implementation of the proposed measures of the Plan. These are summarised in **Table 8-1**.

Table 8-1: Recommended amendments to proposed measures of the Plan as included in the Blueprint

Measure	Recommended Mitigation
Cattle Intervention	
Field Surveillance and Testing	It is recommended that an appropriate Standard Operating Procedure (SOP) be produced to provide guidance on the safe handling and transport of samples, including, for example, specifying the required cold storage temperature. It is also recommended that DAERA includes information on the performance assessment process that will be used to review the effectiveness of the enhanced training and monitoring/supervision of tests, including whether this

Measure	Recommended Mitigation
	will be based on the number of tests undertaken, compliance information, or veterinary competence testing.
Abattoir Surveillance	It is recommended that an appropriate SOP is produced to provide guidance on abattoir surveillance measures to be undertaken, and that consideration is given to competency checks on abattoir staff to ensure that training has been delivered in an appropriate manner.
Interferon Gamma (IFNg) Testing	It is recommended that an appropriate SOP be produced to set out the process for increased testing numbers, such as a standardised sampling procedure and the use of biohazard control measures. These could include ensuring that samples are sealed in leak-free environments and that staff receive training to minimise contamination risks, such as spill management and disinfection. It is also unclear from the measure whether extending the testing window to 24 hours would require the use of cold storage, and the provisions for this should be considered further. It is also recommended that DAERA provide information on the costs associated with increased testing targets, including whether these costs would be met through government-based schemes or by herd owners, given the proposed large increase in testing targets.
Criteria for Officially Tuberculosis Free (OTF) Status	It is recommended that further information is provided by DAERA on how the criteria on OTF status may be altered by this measure, as it is currently unclear whether the criteria surrounding OTF status would become stricter or more relaxed.
Inconclusive Skin Reactors (ICs)	It is recommended that further information is provided by DAERA on how the proposals for managing inconclusive skin reactors may be formulated, as it is currently unclear how these proposals would impact on bTB management.
Full and Partial Depopulations	It is recommended that further information is provided by DAERA on how this measure would affect depopulation and restocking policy, as it is currently unclear what impact these proposals would have on depopulation and restocking arrangements.
Restocking after bTB Breakdown and Application of Severe Breakdown status	It is recommended that DAERA provides further information on how this measure would affect the criteria for bTB restocking and the application of severe breakdown status, as it is currently unclear how the review of these criteria would impact restocking arrangements and the application of a severe breakdown status.
Herds with prolonged and recurring breakdowns	It is recommended that DAERA provides further information on the proposed pilot scheme, such as its spatial and temporal scope, and the criteria that would be used to determine which herds qualify as having prolonged and recurring breakdowns. It is also recommended that further information be provided on the composition of the taskforce, the interventions and advice that may be used, and the criteria that would be applied to assess the effectiveness of the pilot.
Whole Genome Sequencing	It is recommended that DAERA provides further information on the pilot project, as it is not currently committed to. This could include

Measure	Recommended Mitigation
	details of its spatial and temporal scope, as the effects of the measure currently remain uncertain.
Legislative powers to test non-bovines for bTB	It is recommended that DAERA provides further information on which non-bovine species this measure may be applied to, and whether the legislation would be limited to farms contiguous to bovine farms. This may be important as bTB has also been found in non-livestock species, such as cats and dogs. Further information should also be provided on the possible actions to be taken if bTB is detected in non-bovine animals, e.g., whether slaughter, biosecurity measures such as premises disinfection, or movement restrictions could be required.
Restrictions and risk-based trading	It is recommended that DAERA provides further information on the potential alterations to pre- and post-movement testing, and how these may affect bTB management for cattle herd owners. Information should also be provided on how information sharing will be undertaken, including the format this would take and how data confidentiality would be ensured.
Herd Health Management and Biosecurity Advice	It is recommended that DAERA provides information on its animal health programmes, and wider programmes, which would be used to align biosecurity measures for bTB control. It is also recommended that information is provided on the biosecurity assessment protocol to be implemented, such as the information required on biological agents, data, and equipment.
Capital grants for safe and effective on farm testing facilities and biosecurity improvements	It is recommended that DAERA provides further information on the grant aid and how this may extend toward testing facilities and biosecurity improvements. It is also recommended that DAERA makes a clear commitment to the grant aid, as its implementation remains uncertain.
Wildlife Intervention	
Wildlife Intervention	There is potential for negative impacts on BFF and the local badger population from the introduction of potential wildlife intervention options. If culling by shooting is to be used to remove 70% of the population, the information currently available does not explain how this target will be determined or monitored. It is noted that culling may be followed by vaccination as an exit strategy, potentially after an initial five-year intervention period, although this would depend on the local disease situation and whether intervention continues. Further information should therefore be provided on how interim monitoring and review will ensure that culling does not have adverse long-term effects on badger population viability within the intervention area. Further information should be provided on the location of the traps, and whether these may be located in exposed areas where trapped animals could be subject to adverse weather conditions Information should be provided regarding how designated sites present within intervention areas will be accessed and if an exclusion zone around these sites may be implemented to prevent disturbance to species and habitats within these areas. Any zone of influence or exclusion should consider the species present within the designated

Measure	Recommended Mitigation
	site and their respective sensitivities to the implementation of the proposed wildlife intervention options. Further information should also be given regarding the disposal of any culled badgers and how the culled badger carcasses will be transported and disposed of should the badger possess bTB, to prevent cross-contamination and infection occurring.
Badger RTA Survey	It is recommended that DAERA provides further information on the potential strategies and policies which may be used to optimise the use of data from badger RTA surveys as it is presently unclear from the measure how this information will be used.
Badger Sett App	It is recommended that DAERA provides further information on how publicly recorded data on the location of badger setts will be kept secure as should data become publicly available on the location of badger setts, or potentially become available e.g. through a data breach or leak that this may result in negative effects on badgers through sett locations being used for illegal activities such as badger baiting with ethical and welfare issues arising.
Role of Deer	It is recommended that DAERA provides further information regarding the proposals on the management of deer as it is presently unclear from the measure how this may be used to address tuberculosis as to whether this may involve vaccination and/or culling measures as part of a strategy approach.

8.2.2 Recommended amendments to the proposed measures of the potential Wildlife Intervention options

An assessment of the proposed measures of the Plan, as detailed within the potential Wildlife Intervention Options consultation document, is provided in **Section 7.2**. Mitigation measures have been recommended where the potential for negative or uncertain effects on the SEOs from the implementation of the measures has been identified. These mitigation measures aim to prevent, reduce, and as fully as possible offset negative or uncertain effects on the environment that have been identified from the implementation of the proposed measures of the Plan. These are summarised in **Table 8-2**.

Should an amendment be made to the proposed open season dates of the potential wildlife intervention options, it is recommended that consideration should be given to the potential culling of pregnant or nursing female badgers with cubs located underground within setts. This will include the need to include mitigation measures to ensure that no negative welfare implications occur for badger cubs potentially left located underground should a nursing female badger be culled or for population reproduction dynamics of badgers should a large number of pregnant female badgers are culled.

Table 8-2: Recommended amendments to proposed measures of the Plan, as included in the potential Wildlife Intervention Options consultation document

Measure	Recommended Mitigation
Wildlife Intervention	
Non-Selective Culling Approaches	There is potential for negative impacts on BFF and the local badger population from the introduction of potential wildlife intervention options. If non-selective culling by shooting is used to reduce the badger population by 70%, further information should be provided on how interim monitoring and review will ensure that culling does not have negative population consequences for the long-term persistence

Measure	Recommended Mitigation
	of badgers within the intervention area, or any wider ecological implications. Further information should be provided on the location of the traps, including cage traps and stopped restraints, and whether these may be located in exposed areas where trapped animals could be subject to adverse weather conditions. Further information should be provided on who will be responsible for carrying out the wildlife intervention methods, with the use of culling via shooting, information on the specific training received by those undertaking the intervention methods should be given. Overall monitoring of the welfare implications of the non-selective culling is also recommended such as an overseeing veterinary surgeon to ensure no undue suffering occurs. Information should also be provided on the health and safety measures that will be taken during shooting to ensure that no accidental discharge occurs to property or persons. Information should be provided regarding how designated sites present within intervention areas will be accessed and if an exclusion zone around these sites may be implemented to prevent disturbance to species and habitats within these areas. Any zone of influence or exclusion should consider the species present within the designated site and their respective sensitivities to the implementation of the proposed wildlife intervention options. Further information should also be given regarding the disposal of any culled badgers and how the culled badger carcasses will be transported and disposed of should the badger possess bTB, to prevent cross-contamination and infection occurring.
Test and Vaccinate or Remove Approaches	There is potential for negative impacts on BFF and local badger population from the introduction of potential wildlife intervention options. Information should be provided on how the badgers will be anesthetized, for example by injection or other means, and how any test-negative badgers will be monitored to ensure that they recover from anaesthesia before being released back into the wild. This should also include the steps that will be taken should an anaesthetised badger show adverse effects e.g. recovery time allowed and any veterinary intervention that may be required. Further information should be provided on the location of the traps, including cage traps and stopped restraints, and whether these may be located in exposed areas where trapped animals could be subject to adverse weather conditions. Further information should also be provided on the proportion of the badger population within the intervention area that may be vaccinated or culled. The potential effects of culling on badger population dynamics and the long-term survival of the population within the area are currently unclear. Monitoring is therefore recommended to determine culling rates and assess how these may affect population viability. Information should be provided regarding how designated sites present within intervention areas will be accessed and if an exclusion zone around these sites may be implemented to prevent disturbance to species and habitats within these areas. Any zone of influence or exclusion should consider the species present within the designated

Measure	Recommended Mitigation
	site and their respective sensitivities to the implementation of the proposed wildlife intervention options. Further information should also be given regarding the disposal of any culled badgers and how the culled badger carcasses will be transported and disposed of should the badger possess bTB, to prevent cross-contamination and infection occurring.
Vaccination Only Approaches	There is potential for negative effects on BFF on badger welfare from the deployment of cage trapping or stopped restraints to facilitate vaccination. Further information should be provided on the location of the traps, including cage traps and stopped restraints, and whether these may be located in exposed areas where trapped animals could be subject to adverse weather conditions. It is recommended that information is provided on the proportion of the local badger population that would need to be vaccinated in order to achieve the aims of the programme, as well as the likely timescales involved in implementing this potential wildlife intervention option. This should include how long cage traps or stopped restraints may need to be deployed, given the potential for other species to become accidentally trapped by these methods.
Lay Vaccinators	As this proposal has been assessed as neutral on the SEO topics, no specific mitigation measures are recommended.

The total area over which intervention would take place would not conflict with the protection afforded to protected species under the Bern Convention. Therefore, the total intervention area would not at any one time exceed 30% of the total agricultural land area in Northern Ireland. Badgers can be found across a range of habitats including grasslands, heathland and moorlands, farmland, orchard, woodland, as well as urban areas of towns and garden. However, the preferred habitat comprises coniferous, deciduous or mixed woodlands, often favouring areas adjacent to open fields. Therefore, the proposed intervention areas have potential to cover a variety of habitats and may interact with areas of local settlement and population as well as heritage assets. Consideration should be given to the need to undertake site-level screening and appropriate mitigation to ensure any local settlements are aware of the ongoing activities and the need for suitable health and safety measure implementation. Furthermore, heritage assets may be designated as scheduled monuments with an associated regulatory framework for protection; appropriate consultation and consent should be obtained prior to the undertaking of activities within these areas, as such activities could constitute criminal behaviour without the requisite consents under the Historic Monuments and Archaeological Objects (NI) Order 1995 to prevent damage to heritage assets.

8.3 HRA Mitigation

A screening for appropriate assessment was undertaken to establish whether or not the Plan is likely to have a significant negative effect upon the integrity of any European site (either alone or in combination with other plans and projects) in view of the site's Conservation Objectives. This appraisal considered the potential effects of habitat loss, degradation and fragmentation, changes in badger ranging behaviour and associated predation effects, accidental bycatch of other Annex II species under capture methods and the European Sites present throughout Northern Ireland. No pathway of effect was identified which could result in a Likely Significant Effect on any European Site. As no effects beyond a potentially *de minimis* level were identified, the screening determined that there was no prospect that Likely Significant Effects could occur in combination with any other plan or project. On the basis of this screening appraisal, it was determined that there is no requirement for the Plan to undergo Appropriate Assessment. Therefore, no mitigation measures are required.

8.4 Monitoring

8.4.1 DAERA Programme Monitoring

The Blueprint notes that delivery of the proposed measures will be subject to regular review, with DAERA publishing an annual report and update. This report will set out the bTB disease situation in the preceding year alongside recording progress with implementation of the Blueprint. DAERA's programme management structures are also in place to oversee the implementation of the Blueprint, with a Programme Board meeting quarterly and a Project Lead Group meeting monthly. In addition, the TBPSG meets every six weeks to track progress on the Blueprint and to facilitate discussion of policy developments with key stakeholders. Disease monitoring has also been strengthened to track overall progress towards bTB eradication and assess disease trend impacts through regular analysis and reporting on DAERA's website. DAERA publishes monthly TB disease statistics, including herd incidence, animal incidence, and confirmed herd and animal prevalence. With regard to the potential Wildlife Intervention Options consultation document, it is noted that the introduction of the intervention options intends to support the long-term eradication of bTB. In the short term, the objective is to reduce the number of bTB herd breakdowns and reverse the recent upward disease trend through the introduction of wildlife measures within fifteen years of commencement.

The consultation document outlines that DAERA will put in place proportionate arrangements to monitor the deployment of any chosen wildlife intervention option. This includes oversight of the operational activity to ensure compliance with the agreed protocols, welfare, licensing and regulatory requirements, as well as the collection of data and review to assess implementation. Monitoring will be a combination of field information, surveillance and epidemiological data, and reporting from delivery partners. These findings will be used to inform the ongoing management of the intervention options, contribute to periodic review and support the wider evaluation of progress within the bTB eradication strategy. It is recommended that the specific monitoring parameters which may be used to measure the effectiveness and success of the introduced measures is included in the consultation document. It is recommended that DAERA consider the use of information such as details on the number of badgers culled (to monitor intervention area population dynamics), the number of badgers vaccinated, information on herd breakdowns, reactors found during testing, and bTB infection rates, to monitor the performance of the introduced measures on an annual basis and to inform adjustments to approaches taken.

8.4.2 SEA Monitoring

Separate to the monitoring and reporting to be undertaken by DAERA as outlined above in **Section 8.4.1**, where a plan or programme has been subject to SEA, the SEA Directive requires that significant environmental effects arising from its implementation are monitored into to identify, at an early stage, any unforeseen adverse effects and in order to undertake appropriate remedial action.

SEA monitoring should be undertaken in conjunction with the plan reviews, to enable monitoring outcomes to influence the development, amendment and implementation of the measures. The SEA monitoring programme in **Table 8-3** is based on the Indicators and Targets established in the SEOs (given in **Section 5**) and is formulated for the SEOs where potential for effects has been determined.

The environmental monitoring proposed can be collated from existing information gathered regarding bTB disease outbreaks, however information in relation to badgers will require new monitoring to be established. Other data in relation to designated sites and species, human health and air quality can be obtained from environmental monitoring undertaken by bodies such as DAERA, AFBI, Public Health Agency and NISRA. Some of the indicators and data proposed for the monitoring of the Plan implementation are at a strategic level, to match the SEOs, e.g. information on bTB disease outbreaks, designated sites and species. The data sources for monitoring of effects are mostly at a strategic level, are nationally consistent and all are freely available, as is typical for SEA monitoring. However, indicators and data proposed for monitoring of badgers will be required on a bespoke, local basis subject to the intervention areas proposed for implementation of the potential wildlife intervention options.

Table 8-3: SEA Monitoring of the Plan

SEO	Indicator	Target	Proposed Data Source(s)
Biodiversity, Flora and Fauna Avoid damage to, and where possible enhance, biodiversity, flora and fauna.	• Conservation condition of designated habitats and species within International/European and national designated sites (SACs, SPAs, Ramsar sites, MCZs, ASSIs). • Status of protected and priority habitats and species (Annex I habitats, Annex II species and Annex IV species, NI Priority Habitats and Species, OSPAR Threatened or Declining Habitats and Species). • Population dynamics, status and abundance of species protected through the Wildlife (NI) Order 1985 and amendment The Wildlife (Amendment) (Northern Ireland) Order 1995 including badgers.	• No negative change, or a positive change, in the conservation status of designated habitats and species within International, European and National designated sites. • No negative change, or a positive change, in the status of protected or priority species and habitats outside designated sites, or to areas of known importance. • No negative long term change in the status of species protected through the Wildlife (NI) Order 1985 and amendment The Wildlife (Amendment) (Northern Ireland) Order 1995 at a national level.	• Plan monitoring data on badger populations within intervention areas, e.g. number present, numbers culled/vaccinated, bTB infection information. • DAERA National Site Network reporting (every 6 years) for European sites / Article 17 Habitats Directive reporting and Article 12 Bird Directive reporting for the Republic of Ireland. • DAERA Condition Assessment reporting for ASSIs. • NPWS and National Biodiversity Data Centre information with routine monitoring programmes in place for specific species/habitats in the Republic of Ireland.
Population and Human Health Reduce rate of TB incidence in the population and avoidance of generation of noise disturbances	• bTB incidence rates in the population. • Local council noise disturbance rates.	• No negative change, or a positive change, in the bTB incident rates in the population. • No negative change in local council noise disturbance rates/incidents because of culling activities.	• Public Health Agency data for TB infection rates. • Strategic noise maps. • Local council noise complaint information within intervention areas to monitor potential effects of the use of shooting as a culling method on local populations. • DAERA Noise Complaint Statistics Reports.
Air Avoid, prevent or reduce harmful effects on human	• Quantity and trends of air emissions.	• No negative change in the quantity of emissions to air	• National Atmospheric Emissions Inventory (NAEI) reporting.

SEO	Indicator	Target	Proposed Data Source(s)
health and the environment resulting from emissions and noise pollution to air.	• Local council noise disturbance rates.	arising from the potential Wildlife Intervention Options. • No negative change in local council noise disturbance rates/incidents as a result of culling activities.	• Air Pollution in Northern Ireland reporting by DAERA. • Air Pollution Information System (APIS) pollutant monitoring. • Local council noise complaint information within intervention areas to monitor potential effects of the use of shooting as a culling method on local populations.
Material Assets and Infrastructure Support economic agricultural activities and productivity through reduction in bTB incidence and herd breakdowns.	• Agricultural outputs and productivity. • bTB incident rates in livestock. • bTB herd breakdown rates. • Quality of animal products available for consumption	• Sustainable increase in agricultural productivity, i.e. a more efficient use of resources with fewer bTB affected cattle slaughtered. • Decrease in the occurrence of bTB affected cattle numbers and herd breakdowns. • No negative change, or a positive change in the quality of animal products.	• NISRA statistics • Statistical review of NI agriculture (DAERA). • Agricultural Census in Northern Ireland (DAERA). • Tuberculosis Disease Statistics in Northern Ireland (DAERA). • Food Quality Assurance schemes of products from the agri-food industry.

9 Summary and Conclusions

An SEA was undertaken of the Plan for the eradication of bTB. The SEA Environmental Report has identified the potential positive and negative effects on the wider environment from implementing the measures proposed for inclusion in the Plan, along with highlighting the potential cumulative or synergistic effects of measures. This report is designed to help support the further consideration of these measures and the implementation of the Plan by DAERA.

In general, the Plan aims to introduce measures to address the prevalence of bTB infection through targeting Cattle, Wildlife, People and Governance. The Plan includes measures listed within the Blueprint and within the separate consultation document for the potential Wildlife Intervention Options. These measures were assessed in terms of their potential for positive and negative effects, and the significance of these effects on the environment against a set of SEOs covering the breadth of environmental topics considered by the SEA; these were developed in the context of the broader environmental protection objectives set at both international and national level. The purpose of this was to predict and evaluate as far as possible, the environmental effects of the Plan, highlighting any significant environmental problems and/or benefits that are likely to arise from its implementation. The implementation of the Plan is unlikely to lead to significant positive or negative, direct or indirect effects in the short, medium or long-term at the strategic national scale on the SEA topics of Geology, Soils and Land Use, Water, Climatic Factors, Cultural, Architectural and Archaeological Heritage and Landscape and Visual Amenity, with only a number of highly localised potential effects identified within these SEA topics, and these topics were therefore assessed as neutral in the environmental assessment.

For the most part, the measures proposed for cattle intervention will have potential for positive effects on the SEOs for Material Assets and for Population and Human Health, provided they are effectively implemented and enforced. The measures proposed for the wildlife intervention options generally have the potential for negative effects on the SEOs for Air, Population and Human Health and Biodiversity, Flora and Fauna. An exception to this is the identification of the potential for positive effects from the implementation of the vaccination options of the wildlife intervention, as this method would help to address bTB infection within badger populations and improve overall badger health without a requirement for a large population reduction within intervention areas. However, it should be noted under the vaccination only approach, that bTB infected badgers will remain in the badger population, over time the prevalence of the disease will reduce with vaccination but this may involve long timescales to achieve eradication.

Consideration of the environmental baseline conditions indicates that bTB incidences and infections have continued to increase in Northern Ireland, with associated high expenditure by government on eradication and compensation and therefore action is required to address this. The introduction of measures of cattle intervention, and wildlife intervention, are expected to contribute to a positive direction change regarding the prevalence of bTB. However, key consideration should be given to the implementation of the potential wildlife intervention options regarding the importance of badgers to ecology and biodiversity. Specific mitigation has been proposed for the Plan, where the potential for negative and/or uncertain effects on SEOs from the implementation of measures has been identified in the assessments.

A screening appraisal for appropriate assessment was undertaken regarding the Plan to establish whether or not the Plan is likely to have a significant negative effect upon the integrity of any European site (either alone or in combination with other plans and projects) in view of the site's Conservation Objectives. This appraisal considered the potential effects of habitat loss, degradation and fragmentation, changes in badger ranging behaviour and associated predation effects, accidental bycatch of other Annex II species under capture methods and the European Sites present throughout Northern Ireland. No pathway of effect was identified which can result in a Likely Significant Effect on any European. As no effects beyond a potentially *de minimis* level were identified, the screening determined that there was no prospect that Likely Significant Effects could occur in combination with any other plan or project. On the basis of this screening appraisal, it was determined that there is no requirement for the Plan to undergo Appropriate Assessment.

10 Next Steps

Consultations on the Plan, SEA Environmental Report and screening for appropriate assessment will commence in July 2026 and will run for 12 weeks. These documents will be made available for viewing digitally via the DAERA website - https://www.daera-ni.gov.uk/consultations

Following completion of the consultation period, all comments will be collated, and the Plan, SEA Environmental Report and screening for appropriate assessment will be reviewed and revised as necessary. Provided there are no objections or comments that will significantly alter the Plan, the final version of the Plan can be drafted and adopted. This is anticipated to be in Q4 2026. Following release of the adopted Plan, an SEA statement will be drafted to summarise the process undertaken and identify the manner by which environmental considerations and consultations were integrated into the final Plan. **Table 10-1** demonstrates the proposed upcoming time stages for the Plan, SEA and HRA.

Table 10-1: Anticipated Milestones

Stage	Dates	SEA / HRA
Development of the Plan	November 2025 – May 2026	Strategic Environmental Assessment and Appropriate Assessment. Writing of SEA Environmental Report and HRA.
Public and statutory consultation on the Plan	July – September 2026	Statutory, Non-Statutory and Public Consultation on Environmental Report and HRA.
Release of Plan	Q4 2026	SEA Environmental Statement

Following adoption of the final Plan, the next stage of the Programme is the development of the Plan legislation, incorporating the advice and mitigation measures proposed in these environmental reports.

The contact for any information regarding the SEA of the Plan is as follows:

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References

Chapter 1 Introduction

No references

Chapter 2 Description of the Potential Wildlife Intervention Options as part of the Bovine Tuberculosis in Northern Ireland Blueprint for Eradication

Courcier, E. A., Menzies, F. D., Strain, S. A. J., Skuce, R. A., Robinson, P. A., Patterson, I. A. P., McBride, K. R., McCormick, C. M., Walton, E., McDowell, S. W. J. and Abernethy, D. A. (2018). Monitoring *Mycobacteruim bovis* in Eurasian badgers (*Meles meles*) killed by vehicles in Northern Ireland between 1998 and 2011. VetRecord, 182, 9, pp. 259. https://doi.org/10.1136/vr.103934

DAERA. (2024). Review of Bovine Tuberculosis in Northern Ireland. Chief Veterinary Officer. Available online at: https://www.daera-ni.gov.uk/sites/default/files/2024-12/24.25.141%20CVO%20Review%20of%20Bovine%20Tuberculosis%20in%20NI.pdf

Smith, G. C. and Cheeseman, C. L. (2007). Efficacy of trapping during the initial proactive culls in the randomized badger culling trial. Veterinary Record, 160(21), 723-726. https://doi.org/10.1136/vr.160.21.723

Smith, G. C. and Budgey, R. (2025). Bovine tuberculosis model validation against a field study of badger vaccination with selective culling. PLOS. One. 20(7), https://doi.org/10.1371/journal.pone.0320830

Smith, G. C. and Delahay, R. J. (2018). Modeling as a Decision Support Tool for Bovine TB Control Programs in Wildlife. Frontiers in Veterinary Science. 5, 276. https://doi.org/10.3389/fvets.2018.00276

Robertson, A., Chambers, M. A., Smith, G. C., Delahay, R. J., McDonald, R. A. and Brotherton, P. N. M. (2025). Can badger vaccination contribute to bovine TB control? A narrative review of the evidence. Preventive Veterinary Medicine. 238. https://doi.org/10.1016/j.prevetmed.2025.106464

Arnold, M. E., Courcier, E. A., Stringer, L. A., McCormick, C. M., Pascual-Linaza, A. V., Collins, S. F., Trimble, N. A., Ford, T., Thompson, S., Corbett, D. and Menzies, F. D. (2021). A Bayesian analysis of Test and Vaccinate or Remove study to control bovine tuberculosis in badgers tuberculosis in badgers *(Meles meles)*. PLOS. One. 16(1). https://doi.org/10.1371/journal.pone.0246141

Byrne, A. W., O'Keeffe, J., Green, S., Sleeman, D. P., Corner, L. A. L., Gormley, E., Murphy, D., Martin, S. W. and Davenport, J. (2012). Population Estimation and Trappability of the European Badger *(Meles meles)*: Implications for Tuberculosis Management. PLOS. One. 7(12). https://doi.org/10.1371/journal.pone.0050807

Menzies, F. D., McCormick, C. M., O'Hagan, M. J. H., Collins, S. F., McEwan, J., McGeown, C. F., McHugh, G. E., Hart, C. D., Stringer, L. A., Molloy, C., Burns, G., McBride, S. J., Doyle, L. P., Courcier, E. A., McBride, K. R., McNair, J., Thompson, S., Corbett, D. M., Harwood, R. G. and Trimble, N. A. (2021). Test and vaccinate or remove: Methodology and preliminary results from a badger intervention research project. VetRecord. 248. https://doi.org/10.1002/vetr.248

IEP. (2014). Pilot Badger Culls in Somerset and Gloucestershire, Report by the Independent Expert Panel. Available online at: https://assets.publishing.service.gov.uk/media/5a7ebd49ed915d74e33f21d5/independentexpert-panel-report.pdf

Byrne, A. W., O'Keffe, J., Fogerty, U., Rooney, P. and Martin, S. W. (2014). Monitoring trap-related injury status during large-scale wildlife management programmes: an adaptive management approach. European Journal of Wildlife Research. 61(3). https://doi.org/ 10.1007/s10344-015-0916-6

DEFRA. (2022b). Cage-trapping and dispatch of badgers under licence to prevent the spread of bovine TB in cattle. Department for Environment, Food and Rural Affairs. Available online at: https://www.gov.uk/government/publications/cage-trapping-and-dispatch-of-badgers-under-licence-to-preventthe-spread-of-bovine-tb-in-cattle

DEFRA. (2022a). Controlled shooting of badgers in the field under licence to prevent the spread of bovine TB in cattle. Department for Environment, Food and Rural Affairs. Available online at:

https://assets.publishing.service.gov.uk/media/630e1f72e90e0729dcbd7ed1/Controlled_Shooting_of_Freeranging_Badgers_BPG_-_August_2022.pdf

Smith, G. C., Budgey, R. and Delahay, R. J. (2013). A simulation model to support a study of test and vaccinate or remove (TVR) in Northern Ireland. Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daera-ni.gov.uk/sites/default/files/publications/dard/fera-tvr-modelling-report.pdf

Chapter 3 Baseline and Environmental Issues

Allen, A. R., Ford, T. and Skuce, R. A. (2021). Does *Mycobacterium tuberculosis* var. *bovis* Survival in the Environment Confound Bovine Tuberculosis Control and Eradication? A Literature Review. Veterinary Medicine International. https://doi.org/10.1155/2021/8812898

Allen, A. R., Skuce, R. A. and Byrne, A. W. (2019). Bovine Tuberculosis in Britain and Ireland – A Perfect Storm? The Confluence of Potential Ecological and Epidemiological Impediments to Controlling Chronic Infectious Disease. Frontiers in Veterinary Science. 6. https://doi.org/10.3389/fvets.2019.00213

ASC. (2016). UK Climate Change Risk Assessment 2017 Evidence Report – Summary for Northern Ireland. Adaption Sub-Committee of the Committee on Climate Change, London. Available online at: https://www.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Northern-Ireland-NationalSummary.pdf

Aurell, J., Holder, A . L., Gullett, B. K., Sowers, T. D., Weinstein, J., Kariher, P. McNesby, K., Ho Kim, Y. and Gilmour, M. I. (2025). Gas and Particle Emissions from Rifle and Pistol firing. Journal of Hazardous Materials, 476. https://doi.org/10.1016/j.jhazmat.2024.135196

Badger Trust. (2017). Give Badgers a Brake. Badger Trust. Available online at: https://www.badgertrust.org.uk/gbab

Badgerland. (2025). Badger Setts. Badgerland. Available online at: https://badgerland.co.uk/animals/sett

Bennett, L., Blannin, L., Cottey, R., Miles, J., Mitchell, J., Putnam, S., Shams, F., Richmond, B. and Willis, D. (2025). Air Pollutant Inventories for England, Scotland, Wales and Northern Ireland: 2005-2023. National Atmospheric Emissions Inventory. Available online at: https://naei.energysecurity.gov.uk/sites/default/files/2025-09/DG_AP_Inventory_20052023_Report_FINAL_for_publication.pdf

DAERA. (2005). Northern Ireland Species Action Plan Freshwater Pearl Mussel *Margaritifera margaritifera.* Department for Agriculture, Environment and Rural Affairs. Available online at: https://www.daerani.gov.uk/sites/default/files/publications/doe/Natural-plan-species-action-freshwater-pearl-mussel.pdf

DAERA. (2013a). Delivering Resource Efficiency – The Northern Ireland Waste Management Strategy 2013. Department for Agriculture, Environment and Rural Affairs. Available online at: https://library2.nics.gov.uk/pdf/dof/2022/PDF220064.pdf

DAERA. (2013b). Habitats Directive Annexes of Habitats and Species. Department for Agriculture, Environment and Rural Affairs. Available online at: https://www.daera-ni.gov.uk/sites/default/files/publications/doe/naturalinformation-ni-habitats-and-species-2013.pdf

DAERA. (2014). Northern Ireland Regional Seascape Character Assessment. Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daera-ni.gov.uk/publications/northern-irelandregional-seascape-character-assessment

DAERA. (2015). Northern Ireland list of priority habitats. Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daerani.gov.uk/sites/default/files/publications/doe/ni_priority_habitats_april__10.pdf

DAERA. (2018). UK Climate Projections (UKCP18). Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daera-ni.gov.uk/articles/uk-climate-change-projections

DAERA. (2019a). Planning for the third cycle River Basin Plan 2021-2027. Consultation on Significant Water

Management Issues, North Western, Neagh Bann and North Eastern River Basin Districts. Department for Agriculture, Environment and Rural Affairs. Available online at: https://www.daerani.gov.uk/sites/default/files/consultations/daera/Consultation%20on%20Significant%20Water%20Management%20Issues%20December%202019.PDF

DAERA. (2019b). Pine marten (Martes martes). Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daera-ni.gov.uk/articles/pine-marten-martes-martes

DAERA. (2019c). Test and vaccinate or remove (TVT) wildlife intervention research. Department of Agriculture, Environment and Rural Affairs. Available online at: Test and vaccinate or remove (TVR) wildlife intervention research | Department of Agriculture, Environment and Rural Affairs

DAERA. (2020). Clean Air Strategy for Northern Ireland, A Public Discussion Document, November 2020. Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daerani.gov.uk/sites/default/files/consultations/daera/20.21.066%20Draft%20Clean%20Air%20Strategy%20for%20 NI%20-%20Public%20Discussion%20Doc%20Final%20V6.PDF

DAERA. (2021). Water Framework Directive Statistics Report. December 2021. Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daera-ni.gov.uk/sites/default/files/publications/daera/NI%20Water%20Framework%20Directive%20Statistics%20Report%202021.pdf

DAERA. (2023). Northern Ireland list of priority species. Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daera-ni.gov.uk/publications/list-northern-ireland-priority-species-2023

DAERA. (2024). Badger road traffic accident (RTA) survey. Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daera-ni.gov.uk/articles/badger-road-traffic-accident-rta-survey

DAERA. (2025a). Draft 3rd cycle River Basin Management Plan: For the North Western, Neagh Bann and North Eastern River Basin Districts (2021-2027). Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.northernireland.gov.uk/sites/default/files/publications/daera/Draft%203rd%20cycle%20River%20Basin%20Management%20Plan%202021-2027.PDF

DAERA. (2025b). Water Classification Statistics Report 2024. Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daera-ni.gov.uk/sites/default/files/2025-02/NIEA%20%20WMU%20-%20ICP%20-%20NI%20Water%20Classification%20Statistics%20Report%202024.pdf

DAERA. (2025c). Air Pollution in Northern Ireland 2024. Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daera-ni.gov.uk/sites/default/files/202511/Air%20Pollution%20in%20Northern_Ireland%202024%20-Screen%20Version.pdf

DAERA. (2025d). TB Background Information. Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daera-ni.gov.uk/articles/tb-background-information

DAERA. (2025e). Tuberculosis Disease Statistics in Northern Ireland 2025. Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daera-ni.gov.uk/publications/tuberculosisdisease-statistics-northern-ireland-2025

DoC. (2020). NI Heritage Statistics. As recorded on 31 March 2019. Department for Communities. Available online at: https://www.communities-ni.gov.uk/sites/default/files/publications/communities/ni-heritage-statistics310319.pdf

DoE. (2014). Noise Policy Statement for Northern Ireland. Department of the Environment. Available online at: https://www.daera-ni.gov.uk/sites/default/files/publications/doe/noise-policy-statement-ni.PDF

DoH. (2024). Life Expectancy in Northern Ireland 2021-23: Headline Figures. Department of Health. Available online at: https://www.health-ni.gov.uk/news/life-expectancy-northern-ireland-2021-23-headline-figures

EHS. (2003). Shared Horizons. Environment and Heritage Service. Available online at: https://www.daerani.gov.uk/sites/default/files/publications/doe/shared-horizons.pdf

Fine, A. E., Bolin, C. A., Gardiner, J. C. and Kaneen, J. B. (2011). A Study of the Persistence of *Mycobacterium bovis* in the Environment under Natural Weather Conditions in Michigan, USA. Veterinary Medicine International. https://doi.org/10.4061/2011/765430

Goodman, P., Jahanshahi, B., McVicar, D. and Rowland, N. (2023). Air Pollution and Mortality on the Island of Ireland: Estimating Local All-Cause and Circulatory Mortality Burdens Associated with Fine Particulate Matter Pollution in Northern Ireland and the Republic of Ireland. Available online at: https://irishheart.ie/wpcontent/uploads/2023/03/Air-Pollution-and-Mortality-on-the-Island-of-Ireland-Report.pdf

Gormley, S., Donnelly, C., Bell, J. and Hartwell, B. (2009). Condition and Management Survey of the Archaeological Resource in Northern Ireland (CAMSAR). Northern Ireland Environment Agency. Available online at: https://pureadmin.qub.ac.uk/ws/files/6377687/CAMSAR_Report.pdf

Griffin, J., Aznar, I., Breslin, P., Good, M., Gordon, S., Gormley, E., McAloon, C., Menzies, F., More, S., Ring, S. and Wiseman, J. (2023). What is the proportional contribution of cattle-to-cattle, badger-to-cattle, and deer-to-cattle TB transmission to bovine TB in Ireland? Food Risk Assess Europe. 1, 2. https://doi.org/10.2903/fr.efsa.2023.FR-0009

Ham, C., Donnelly, C. A., Astley, K. L., Jackson, S. Y. B. and Woodroofe, R. (2019). Effect of culling on individual badger *Meles meles* behaviour: Potential implications for bovine tuberculosis transmission. Journal of Applied Ecology. 56, 2390-2399. https://doi.org/10.1111/1365-2664.13512

HSC NI. (2025a). Epidemiology of Tuberculosis in Northern Ireland. Annual Surveillance Report 2025. Health and Social Care Northern Ireland. Public Health Agency. Available online at: https://www.publichealth.hscni.net/sites/default/files/2025-08/Tuberculosis%20%28TB%29%20Surveillance%20Report%202025.pdf

HSC NI. (2025b). TB still on increase in Northern Ireland. Health and Social Care Northern Ireland. Public Health Agency. Available online at: https://www.publichealth.hscni.net/news/tb-still-increase-northern-ireland

JNCC. (2019). UK General Implementation Report for period 2013-2018. The 4th UK Habitats Directive Report. Joint Nature Conservation Committee. Available online at: https://data.jncc.gov.uk/data/49d215d2-3780-40dca777-dd956f3b9c7a/Article17-AnnexA-2019-A.pdf

JNCC. (2019b). European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC). Fourth Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2013 to December 2018. Supporting documentation for the conservation status assessment for the species: S1029 – Freshwater pearl mussel (*Margaritifera margaritifera*) Northern Ireland. Available online at: https://jncc.gov.uk/jncc-assets/Art17/S1029-NI-Habitats-Directive-Art17-2019.pdf

Kurek, P. and Cykowska-Marzencka, B. (2016). Badger *Meles meles* setts and bryophyte diversity: A newly found role for the game animal in European temperate forests. Forest Ecology and Management. 372, 199-205. https://doi.org/10.1016/j.foreco.2016.04.021

Met Office. (2025). UK Regional Climates. Meteorological Office. Available online at: https://www.metoffice.gov.uk/research/climate/maps-and-data/regional-climates/index#rainfall

Mitchell-Jones, A. J. (2020). Badger impacts on biodiversity and agriculture in Scotland: a literature review. NatureScot Research Report No. 1205. Available online at: https://www.nature.scot/sites/default/files/2020-08/Publication%202020%20-%20NatureScot%20Research%20Report%201205%20%20Badger%20impacts%20on%20biodiversity%20and%20agriculture%20in%20Scotland%20%20a%20literature%20review.pdf

Mori, E. and Menchetti, M. (2019). Living with roommates in a shared den: Spatial and temporary segregation among semifossorial mammals. Behavioural Processes. 164, 48-53. https://doi.org/10.1016/j.beproc.2019.04.013

National Museums Northern Ireland. (2018). *Margaritifera margaritifera* – freshwater pearl mussel. Northern Ireland Priority Species. Available online at: https://www.habitas.org.uk/priority/species.asp?item=6779

Ní Bhuachalla, D. N., Corner, L. A. L., More, S. J. and Gormley, E. (2014). The role of badgers in the epidemiology of *Mycobacterium bovis* infection (tuberculosis) in cattle in the United Kingdom and the Republic of Ireland: current perspectives on control strategies. Veterinary Medicine: Research and Reports, 6, pp 27-38. https://doi.org/10.2147/VMRR.S53643

NI Direct. (2025). Noise nuisance and neighbours. NI Direct. Available online at: https://www.nidirect.gov.uk/articles/noise-nuisance-and-neighbours#:~:text=Night%20hours%20are%2011.00%20pm,neighbour%20or%20other%20noise%20source

NIEA. (2000). Landscape Character of Northern Ireland. Northern Ireland Environment Agency. Available online at: https://www.daera-ni.gov.uk/articles/landscape-character-northern-ireland

NIEA. (2013). From Evidence to Opportunity, A Second Assessment of the State of Northern Ireland's Environment. Northern Ireland Environment Agency. Available online at: https://www.daerani.gov.uk/sites/default/files/publications/doe/corporate-report-from-evidence-to-opportunity-secondassessment-of-state-of-ni-environment-2013.pdf

NISRA. (2021). Long-term International Migration Statistics for Northern Ireland (2020). Northern Ireland Statistics and Research Agency. Available online at: https://www.nisra.gov.uk/publications/long-terminternational-migration-statistics-northern-ireland-2020

NISRA. (2022). Census 2021, Main Statistics for Northern Ireland, Phase 2. Northern Ireland Statistics and Research Agency. Available online at: https://www.nisra.gov.uk/system/files/statistics/census-2021-mainstatistics-for-northern-ireland-phase-2-report.pdf

NISRA. (2024a). Statistical Review of Northern Ireland Agriculture 2024. Northern Ireland Statistics and Research Agency. Available online at: https://www.daera-ni.gov.uk/sites/default/files/2025-11/25.26.108%20Stats%20Review%202024_1.pdf

NISRA. (2024b). The Agricultural Census in Northern Ireland. Northern Ireland Statistics and Research Agency. Available online at: https://datavis.nisra.gov.uk/daera/ni-agricultural-census-2024.html

NISRA. (2025a). Northern Ireland Environmental Statistics Report. May 2025. Northern Ireland Statistics and Research Agency. Available online at: https://www.daera-ni.gov.uk/sites/default/files/2025-06/NI%20Environmental%20Statistics%20Report%202025_1.pdf

NISRA. (2025b). 2024 Mid-Year Population Estimates for Northern Ireland. Northern Ireland Statistics and Research Agency. Available online at: https://datavis.nisra.gov.uk/population/2024-mid-year-estimates-fornorthern-ireland.html

NISRA. (2025c). 2022-based Population Projections for Northern Ireland. Northern Ireland Statistics and Research Agency Statistical Bulletin. Available online at: https://www.nisra.gov.uk/system/files/statistics/2025-04/Statistical%20Bulletin%20-%202022-based%20Population%20Projections%20for%20Northern%20Ireland_1.pdf

NISRA. (2025d). Business Register and Employment Survey, 2023. Northern Ireland Statistics and Research Agency. Available online at: https://www.nisra.gov.uk/system/files/statistics/2025-10/BRES-2023Publication.pdf

NISRA. (2025e). Registrar General Northern Ireland Annual Report 2024. Northern Ireland Statistics and Research Agency. Available online at: https://www.nisra.gov.uk/system/files/statistics/202511/RG%20Annual%20Report%202024.pdf

NISRA. (2025f). NI Greenhouse Gas Inventory 1990-2023. Northern Ireland Statistics and Research Agency. Available online at: https://datavis.nisra.gov.uk/daera/northern-ireland-greenhouse-gas-inventory-1990-2023statistical-bulletin.html

NISRA. (2025g). PfG Wellbeing Framework Greenhouse Gas Emissions. Available online at: https://datavis.nisra.gov.uk/executiveofficeni/pfg_wellbeing_dashboard.html?indicator=greenhouse+gas+emissions

Northern Ireland Executive. (2021). The Path to Net Zero Energy. Northern Ireland Executive. Available online at: https://www.economy-ni.gov.uk/sites/default/files/publications/economy/Energy-Strategy-for-NorthernIreland-path-to-net-zero.pdf

O'Brien, A. (2025). DAERA forecasts £56.3m bovine TB compensation spend in NI. Agriland. Available online at: https://www.agriland.ie/farming-news/daera-forecasts-56-3m-bovine-tb-compensation-spend-in-ni/

O'Hagan, M. J. H., McCormick, C. M., McBride, K. R., Kirke, R. W. and Menzies, F. D. (2023). Visits to badger (*Meles meles*) setts by other animals. The Irish Naturalists' Journal, 40, pp. 45-49. https://www.jstor.org/stable/48773483

ONS. (2025). Greenhouse gas emissions, UK: provisional estimates, 2024. Office for National Statistics. Available online at: https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/greenhousegasintensityprovisionalestimateuk/latest

PAW NI. (2020). Badger Persecution Report Northern Ireland 2016-18. Partnership for Action against Wildlife Crime, Northern Ireland. Badger Subgroup November 2020, Issue 1. Available online at: https://80fb1992-445140d0-9d4a-ceb85ee8bb71.filesusr.com/ugd/259455_f23311309c644e91a95e0c782101feff.pdf

Public Health England. (2014). Estimation Local Mortality Burdens associated with Particulate Air Pollution. Gowers, A. M., Miller, B. G. and Stedman, J. R. Public Health England, UK Government. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/332854/PHE_CRCE_010.pdf

Radioactive Waste Management. (2025). Northern Ireland Regional Geology. Available online at: https://assets.publishing.service.gov.uk/media/5d8c8904ed915d0364ba00c3/Northern_ireland_Regional_Geology_V1.0a.pdf

Razai, M. S. and Majeed, A. (2025). The impact of noise pollution on health. BMJ. 391. https://doi.org/10.1136/bmj-2024-081193

Reid, N., Etherington, T. R., Wilson, G. J. Montgomery, W. I. and McDonald, R. A. (2012). Monitoring and population estimation of the European badger *Meles meles* in Northern Ireland. Wildlife Biology. 18(1), 46-57. https://doi.org/10.2981/11-016

Scottish Badgers. (2023). Badgers, Ecosystem Services. Available online at: https://www.scottishbadgers.org.uk/infographics/4-ecosystem-services-2/

Scottish Badgers. (2025). Badger Biology and Ecology. Scottish Badgers. Available online at: https://www.scottishbadgers.org.uk/information-hub/badger-ecology/

Smal, C. (1995). The Badger and Habitat Survey of Ireland. Unpublished Report to the Department of Agriculture and the National Parks and Wildlife Service

State of Nature. (2023). State of Nature Northern Ireland. State of Nature Partnership. Available online at: https://stateofnature.org.uk/wp-content/uploads/2023/09/TP26055-SoN-N_Ireland-summary-report-v4-1.pdf

TB Hub. (2020a). What impact do badgers have on other wildlife? TB Hub funded by NERC Knowledge Exchange. Available online at:https://tbhub.co.uk/wp-content/uploads/2020/02/AR-factsheet-the-effect-ofbadger-culling-on-other-species-151118b.pdf

TB Hub. (2020b). Effects of TB infection in badgers. TB Hub. Available online at: https://tbhub.co.uk/tb-inwildlife/tb-in-badgers/effects-of-tb-infection-in-badgers/

The Wildlife Trust. (2025). European Badger. Available online at: https://www.wildlifetrusts.org/wildlifeexplorer/mammals/european-badger

UK Health Security Agency. (2026). Tuberculosis (TB): diagnosis, screening, management and data. UK Health Security Agency, UK Government. Available online at: https://www.gov.uk/government/collections/tuberculosisand-other-mycobacterial-diseases-diagnosis-screening-management-and-data#treatment,-management-andvaccination

UK Health Security Agency. (2026). Tuberculosis incidence and epidemiology, England, 2024. UK Health Security Agency, UK Government. Available online at: https://www.gov.uk/government/publications/tuberculosis-in-england-2025-report/1-tuberculosis-incidenceand-epidemiology-england-2024

UKSO. (2016). The soils of Northern Ireland. UK Soil Observatory. Available online at: https://www.ukso.org/static-maps/soils-of-northern-ireland.html

USPCA. (2023). Badger Baiting Report. Ulster Society for the Prevention of Cruelty to Animals. Available online at: https://uspca.co.uk/news/uspca-launches-badger-baiting-report

Wilson, M., Dochartaigh, B. Ó., Cooper, M. and Chonchubhair, R. N. (2023). Northern Ireland's Groundwater Environment. Geological Survey of Northern Ireland. Available online at: https://nora.nerc.ac.uk/id/eprint/535562/1/NorthernIreland%27sGroundwaterEnvironment.pdf

Chapter 4 Review of Relevant Plas, Programmes and Policies

No references

Chapter 5 Framework for Assessing Environmental Effects

No references

Chapter 6 Consideration of Alternatives

DAERA. (2026). Bovine Tuberculosis (TB) Control Programme. Department of Agriculture, Environment and Rural Affairs. Available online at: https://www.daera-ni.gov.uk/articles/bovine-tuberculosis-tb-controlprogramme

EPA. (2015). Developing and assessing alternatives in Strategic Environmental Assessment. Environmental Protection Agency. Available online at: https://www.epa.ie/publications/research/biodiversity/EPA-157_web.pdf

ODPM. (2005). A Practical Guide to the Strategic Environmental Assessment Directive. Office of the Deputy Prime Minister. Available online at: https://assets.publishing.service.gov.uk/media/5a78ec0740f0b62b22cbddd2/practicalguidesea.pdf

Chapter 7 Environmental Assessment of the Plan

Pascual-Linaza, A. V., Gordon, A. W., Stringer, L. A. and Menzies, F. D. (2016). Efficiency of slaughterhouse surveillance for the detection of bovine tuberculosis in cattle in Northern Ireland. Epidemiology and Infection. 145 (5), 995-1005. https://doi.org/10.1017/S0950268816003095

TBHub. (2020). Whole genome sequencing of M. bovis isolates in Great Britain. TBHub. Available online at: https://tbhub.co.uk/whole-genome-sequencing-of-m-bovis-isolates-in-great-britain/

Badger Trust. (2024). Badger Trust launches new 'Space for Badgers' campaign. Badger Trust. Available online at: https://www.badgertrust.org.uk/post/badger-trust-launches-new-space-for-badgers-campaign

TB Free England. (2026). Controlling bTB in cattle. TB Free England. Available online at: https://www.tbfreeengland.co.uk/learn-about-btb/controlling-btb-in-cattle/#:~:text=Can%20you%20eat%20meat%20from,than%20one%20organ%2Fbody%20part

Chapter 8 Mitigation and Monitoring

No references

Chapter 9 Summary and Conclusions

No references

Chapter 10 Consultation and Next Steps

No references

Appendices

Appendix A SEA Guidance

Northern Ireland

A Practical Guide to the Strategic Environmental Assessment Directive. September 2005. Office of the Deputy Prime Minister. https://www.gov.uk/government/publications/strategic-environmental-assessment-directive-guidance

Guidance on Sustainability Appraisal and Strategic Environmental Assessment for the Historic Environment. June 2018. Department for Communities – Historic Environment Division

Strategic Environmental Assessment. Services and Standards for Responsible Authorities. Environment and Heritage Service. https://www.daera-ni.gov.uk/publications/strategic-environmental-assessment

Other

Article 8 (Decision Making) of EU Directive 2001/42/EC on Strategic Environmental Assessment (SEA) as amended. DoECLG Circular (PL 9/2013).

Developing and Assessing Alternatives in Strategic Environmental Assessment. 2015. Environmental Protection Agency. http://www.epa.ie/pubs/advice/ea/SEA-Alternatives-157-Published_web.pdf

Development of Strategic Environmental Assessment (SEA) Methodologies for Plans and Programmes in Ireland. Synthesis Report. 2001. Environmental Protection Agency. https://www.epa.ie/pubs/advice/ea/EPA_development_methodology_SEA_synthesis_report.pdf

Further Transposition of EU Directive 2001/42/EC on Strategic Environmental Assessment (SEA). DoECLG Circular (PSSP 6/2011).

GISEA Manual, Improving the Evidence Base in SEA, 2016. Environmental Protection Agency.http://www.epa.ie/pubs/advice/ea/EPA%20GISEA_web.pdf

Implementation of SEA Directive (2001/42/EC). Assessment of Certain Plans and Programmes on the Environment. Guidelines for Regional Planning Authorities. November 2004. Department of Environment, Heritage and Local Government.
http://www.environ.ie/en/Publications/DevelopmentandHousing/Planning/FileDownLoad,1616,en.pdf

SEA Scoping Guidance Document. 2016. Environmental Protection Agency. http://www.epa.ie/pubs/advice/ea/seascopingguidance.html

Strategic Environmental Assessment (SEA) Checklist - Consultation Draft. January 2008. Environmental Protection Agency.
http://www.epa.ie/downloads/consultation/strategic_environmental_assessment_jan086.pdf

Guidance on Strategic Environmental Assessment (SEA) Statements and Monitoring. EPA 2023. https://www.epa.ie/publications/monitoring--assessment/assessment/strategic-environmental-assessment/guidance-on-sea-statements-and-monitoring.php

Good Practice Guidance on SEA Screening. EPA 2021. https://www.epa.ie/publications/monitoring--assessment/assessment/strategic-environmental-assessment/SEA_Screening_GoodPractice_2021.pdf

Good Practice Guidance on Cumulative Effects Assessment in SEA. EPA 2020. https://www.epa.ie/publications/monitoring--assessment/assessment/strategic-environmental-assessment/good-practice-guidance-on-cumulative-effects-assessment-in-sea.php

Integrating Climatic Factors into the SEA Process in Ireland. EPA 2019. https://www.epa.ie/publications/monitoring--assessment/assessment/strategic-environmental-assessment/EPA-SEA-Climatic-Factors-Guidance-Note.pdf

Developing and Assessing Alternatives in SEA. EPA 2015. https://www.epa.ie/publications/research/biodiversity/EPA-157_web.pdf

Guidance on Consideration of Air in Strategic Environmental Assessment. April 2017. Scottish Environment Protection Agency.

Guidance on Consideration of Climatic Factors within Strategic Environmental Assessment. March 2010. Scottish Environment Protection Agency.

Guidance on Consideration of Material Assets in Strategic Environmental Assessment. August 2016. Scottish Environment Protection Agency.

Guidance on Consideration of Soil in Strategic Environmental Assessment. April 2017. Scottish Environment Protection Agency.

Appendix B Plans and Programmes

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
International / European			
UN Convention on Biological Diversity (1992)	Maintenance and enhancement of Biodiversity, and strategies to ensure a fair and equitable sharing of the benefits from the use of genetic resources.	• Conservation of biological diversity (or biodiversity); • Sustainable use of its components; • Fair and equitable sharing of benefits rising from genetic resources; and • Development of national strategies for the conservation and sustainable use of biological diversity.	Environmental protection objectives of the Convention are reflected in the SEOs for Biodiversity, Flora and Fauna.
Ramsar Convention on Wetlands of International Importance (1971 and amendments)	Protection and conservation of wetlands.	Objectives include protection and conservation of wetlands, particularly those of importance to waterfowl as Waterfowl Habitat.	Environmental protection objectives of the Convention are reflected in the SEOs for Biodiversity, Flora and Fauna.
Bern Convention (Convention on European Wildlife and Natural Habitats) (1982)	The Bern Convention is a binding international legal instrument in the field of nature conservation, covering most of the natural heritage of the European continent and extending to some States of Africa.	Objectives are to conserve wild flora and fauna and their natural habitats, as well as to promote European co-operation in this field. The treaty also takes account of the impact that other policies may have on natural heritage.	Environmental protection objectives of the Convention are reflected in the SEOs for Biodiversity, Flora and Fauna.
Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals) (1983)	The Bonn Convention focuses on preserving the habitats used by migratory species and aims to enhance the conservation of terrestrial, marine and avian species on a global scale throughout their range.	Establishes a legal foundation for internationally coordinated conservation measures throughout a migratory range. Migratory species threatened with extinction are listed on Appendix I of the Convention. CMS Parties strive towards strictly protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. In Europe, legislation to ensure that the provisions of the Bonn convention are applied	Environmental protection objectives of the Convention are reflected in the SEOs for Biodiversity, Flora and Fauna.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		includes the Birds Directive and the Habitats Directive.	
EU Biodiversity Strategy to 2030 [COM (2020)380]	Aims to put Europe's biodiversity on the path to recovery by 2030 for the benefit of people, climate and the planet. The strategy aims to build societies' resilience to future threats such as: the impacts of climate change, forest fires, food insecurity and disease outbreaks.	The strategy contains specific commitments and actions to be delivered by 2030: • Establishing a larger EU-wide network of protected areas on land and at sea. Enlarging of existing Natura 2000 areas with strict protection for areas of very high biodiversity and climate value. • Launching an EU nature restoration plan. Including concrete commitments and actions (and proposed binding nature restoration targets) to restore degraded ecosystems by 2030 and manage them sustainably, addressing the key drivers of biodiversity loss. • Introducing measures to enable the necessary transformative change. Unlocking funding for biodiversity, and setting in motion a new, strengthened governance framework. • Introducing measures to tackle the global biodiversity challenge. Working towards adoption of an ambitious global biodiversity framework under the Convention on Biological Diversity.	Environmental protection objectives of the strategy are reflected in the SEOs for Biodiversity, Flora and Fauna.
EU Birds Directive [2009/147/EC]	Protects all wild birds, their nests, eggs and habitats within the European Community. It gives EU member states the power and responsibility to classify Special Protection Areas (SPAs) to protect birds which are rare or vulnerable in Europe, as well as all migratory birds which are regular visitors.	• Preserve, maintain or re-establish a sufficient diversity and area of habitats for all the species of birds referred to in Annex I. • Preserve, maintain and establish biotopes and habitats to include the creation of protected areas (Special Protection Areas); ensure the upkeep and management in accordance with the ecological needs of habitats inside and outside the protected	Environmental protection objectives of the Directive are reflected in the SEOs for Biodiversity, Flora and Fauna. The Plan should ensure that European Sites are suitably protected from loss or damage.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		zones, re-establish destroyed biotopes and creation of biotopes • Measures for regularly occurring migratory species not listed in Annex I is required as regards their breeding, moulting and wintering areas and staging posts along their migration routes. The protection of wetlands and particularly wetlands of international importance.	
EU Habitats Directive [92/43/EEC]	Builds on the Birds Directive (see above) by protecting natural habitats and other species of wild plants and animals. Together with the Birds Directive, it underpins a European network of protected areas known as Natura 2000: Special Protection Areas (SPAs, classified under the Birds Directive) and Special Areas of Conservation (SACs, classified under the Habitats Directive).	• Propose and protect sites of importance to habitats, plant and animal species. • Establish a network of Natura 2000 sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, to enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range. • Carry out comprehensive assessment of habitat types and species present. • Establish a system of strict protection for the animal species and plant species listed in Annex IV.	Environmental protection objectives of the Directive are reflected in the SEOs for Biodiversity, Flora and Fauna. The Plan should ensure that European Sites are suitably protected from loss or damage. Appropriate Assessment is being undertaken for the Plan, to ensure that implementation will not adversely affect SPAs and SACs.
EU Nature Restoration Law 2024	The law aims to restore ecosystems, habitats and species across the EU's land and sea areas to enable the long-term and sustained recovery of biodiverse and resilient nature; contribute to achieving the EU's climate mitigation and climate adaptation objectives; meet international commitments.	• Overarching restoration objective for the long-term recovery of nature in the EU's land and sea areas. • Binding restoration targets for specific habitats and species (pollinating insects, forest ecosystems, urban ecosystems, agricultural ecosystems, marine ecosystems, river connectivity). • These measures should cover at least 20% of the EU's land and sea areas by 2030, and	The Plan will need to have regard for this law regarding transboundary regions.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		ultimately all ecosystems in need of restoration by 2050.	
Stockholm Convention (2004)	The Stockholm Convention is an international treaty with the aim of eliminating or restricting the production and use of persistent organic pollutants (POPs).	The main objective of the treaty is in seeking to protect human health and the environment from POPs.	The Plan will need to have regard for this strategy regarding pollutants.
WHO global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide sulfur dioxide and carbon monoxide (2021)	Global air quality guidelines for pollutants.	• The main objective of these updated global guidelines is to offer health-based air quality guideline levels, expressed as long-term or short-term concentrations for six key air pollutants: PM2.5, PM10, ozone, nitrogen dioxide, sulphur dioxide and carbon monoxide.	The Plan should have regard for WHO air quality guidelines.
WHO Air Quality Guidelines – global update (2005).	Objectives seek the elimination or minimisation of certain airborne pollutants for the protection of human health.	• Air Quality Guidelines (AQGs) were published by the WHO in 1987 and revised in 1997 and most recently in 2005. • These offer guidance on threshold limits for key air pollutants that pose health risks and provide a reference for setting air pollution targets at regional and national levels to improve air quality. • The 2005 guidelines offer recommended exposure levels for particulate matter (PM10 and PM2.5), ozone, nitrogen dioxide and sulphur dioxide, as well as a set of interim targets to encourage progressive improvement in air quality.	The Plan should have regard for the environmental protection objectives of these guidelines, in terms of cumulative emissions affecting air quality.
The Gothenburg Protocol (1999), as amended in 2012.	The 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) is a multi-pollutant protocol designed to reduce acidification, eutrophication and ground-level ozone by setting emissions ceilings for sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia	• The 1999 Protocol set national emission ceilings for 2010 for four pollutants: sulphur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOCs) and ammonia (NH_3);	The Plan should have regard for the environmental protection objectives of the Protocol. These environmental protection objectives are reflected in the SEO for Air Quality.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
	to be met by 2010. The protocol was updated and amended in 2012.	• As amended in 2012, the Protocol includes national emission reduction commitments to be achieved by 2020 and beyond; • Includes specific measures for the control of ammonia emissions from agricultural sources; • Parties must report on their emissions annually, and are required to provide projections of their future emissions.	
Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive [2008/50/EC] & 4th Daughter Directive of the Air Quality Framework Directive [2004/107/EC]	Set air quality standards for protection of human health and the environment. Address air pollution at the level of zones, while the complementary NEC Directive addresses total emissions	• The Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) was published in May 2008. It replaced the Framework Directive and the first, second and third Daughter Directives. • Sets limit and target values for certain pollutants. Covers nitrogen dioxide (NO2) and particulate matter or fine dust (PM10), which is emitted by traffic and combustion engines. • Lays down limit values to be respected by Member States in their zones. • The 4th Daughter Directive relates to arsenic cadmium, mercury, nickel and polycyclic aromatic hydrocarbons.	The Plan should have regard for the environmental protection objectives of these Directives in the SEO for Air Quality.
National Emissions reduction Commitments (NEC) Directive [2016/2284/EU]	This Directive seeks to limit the national emissions of certain airborne pollutants for the protection of human health and the environment. Implements at the EU level obligations under the Geneva Convention and Gothenburg Protocol. It replaced the earlier National Emission Ceilings for Certain Atmospheric Pollutants Directive (2001/81/EC).	It sets the limits on total national emissions from four pollutants - sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia. These can cause acidification (e.g. the chemical composition of the sea acidifies), water and soil pollution (eutrophication) and ground-level ozone (ozone resulting from the reaction of the four pollutants with heat and sunlight).	These environmental protection objectives are reflected in the SEOs for Air Quality.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
Geneva Convention (1979) on Long-range Transboundary Air Pollution (LRTAP)	International agreement with the aim of limiting problems of air pollution on a broad regional basis.	• First international legally binding instrument dealing with problems of air pollution on a broad regional basis. It was signed in 1979 and entered into force in 1983. It has since been extended by eight specific protocols. • Under the Convention, the parties commit to working together to limit, to gradually prevent, and to reduce their discharges of air pollutants to combat the resulting transboundary pollution. • The Convention has substantially contributed to the development of international environmental law and has created the essential framework for controlling and reducing the damage to human health and the environment caused by transboundary air pollution.	Environmental protection objectives of the Convention are reflected in the SEOs for Air Quality.
Environmental Noise Directive [2002/49/EC]	Directive relating to the assessment and management of environmental noise. It requires the publication of noise maps and noise management action plans every 5 years for agglomerations with more than 100,000 inhabitants and major roads, railways and airports.	• Main EU Law to identify noise pollution levels with action in four areas; -determining exposure to environmental noise and assessing its health effects at a single dwelling level; -ensuring that information on environmental noise and its effects is made available to the public; -preventing and reducing environmental noise; and -preserving environmental noise quality in areas where it is good.	The Plan should have regard for the environmental protection objectives of the Directive, particularly those relating to noise generation. These environmental protection objectives are reflected in the SEOs for Air Quality.
EU Common Agricultural Policy (CAP) (1962)	Aims to provide farmers with a reasonable standard of living, consumers with quality food at fair prices and to preserve rural heritage.	The CAP is a common policy for all EU countries, managed and funded at European level from the EU budget. It aims to:	Existing environmental protection objectives associated with the CAP have been considered during development of the Plan.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		• Support farmers and improve agricultural productivity, ensuring a stable supply of affordable food; • Safeguard EU farmers to make a reasonable living; • Help tackle climate change and the sustainable management of natural resources; • Maintain rural areas and landscapes across the EU; and • Keep the rural economy alive by promoting jobs in farming agri-foods industries and associated sectors.	
Seventh Environmental Action Programme to 2020 of the European Community	The Programme guides European environment policy until 2020, and sets out a vision beyond that, of where it wants the EU to be by 2050.	Objectives seek to make the future development of the EU more sustainable. It identifies three key objectives: • To protect, conserve and enhance the Union's natural capital; • To turn the Union into a resource-efficient, green, and competitive low-carbon economy; and • To safeguard the Union's citizens from environment-related pressures and risks to health and wellbeing. Two additional horizontal priority objectives complete the programme: • To make the Union's cities more sustainable; and To help the Union address international environmental and climate challenges more effectively.	Environmental protection objectives of the Programme are reflected in the SEOs for Biodiversity, Flora and Fauna; Population and Human Health; and Air Quality.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
SEA Directive [2001/42/EC]	To provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development.	• Requires that Plans & Programmes consider protection of the environment and integration of the Plan into the sustainable planning of the country. • Eleven sectors are specified in the Directive and Competent Authorities (Plan/ Programme makers) must subject specific Plans and Programmes for these sectors to an environmental assessment where they are likely to have significant effects on the environment.	The Plan will be subject to the SEA process. This is being undertaken through this Scoping Report and subsequent Environmental Report.
UN Convention on Environmental Impact Assessment (ESPOO Convention) 1997 and Kyiv (SEA) Protocol 2003	The ESPOO (EIA) Convention provides for protection of the environment at an early stage of planning for certain activities. Complemented by the Protocol on Strategic Environmental Assessment (Kyiv Protocol).	• Sets out the obligations of Parties to assess the environmental impact of certain activities at an early stage of planning; • Sets out the general obligation of States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries; and • The SEA Protocol augments the Convention by ensuring that individual Parties integrate environmental assessment into their plans and programmes at the earliest stages and provides for extensive public participation in the decision-making process.	The Plan will be subject to the SEA process, which is being undertaken through this SEA Environmental Report.
UN Sustainable Development Goals (2015)	The Sustainable Development Goals or Global Goals are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all".	The UN Sustainable Development Goals outline 17 Sustainable Development Goals and 169 targets to be achieved by 2030 for people, the planet and for prosperity.	The Plan should have regard for the UN Sustainable Development Goals.
Waste Framework Directive [2008/98/EC], as amended in 2018 [2018/51/EU]	• Sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling, recovery. Explains when waste ceases to be waste and becomes a secondary raw material (so called end-	The Directive requires that: • Waste is managed without endangering human health	The Plan should have regard for the environmental protection objectives of this Directive, in terms of cumulative effects on water, soil and air.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
	of-waste criteria), and how to distinguish between waste and by-products.	• Waste is managed without harming the environment. • Waste is managed without harming water, air, soil, plants or animals. • Waste does not cause a nuisance through noise or odours, or to countryside or places of special interest.	
Use and Disposal of Animal By-products (Commission Regulation 2011/EU142)	Outlines health rules as regards animal by-products not intended for human consumption.	• The Regulation lays down strict rules for the collection, transport, storage, handling, processing and use or disposal of all animal by-products.	The Plan should have regard for the environmental protection objectives of this Regulation.
Animal Health Law (Regulation (EU) 2016/249)	Outlines rules for the prevention and control of animal diseases which are transmissible to animals or to humans	This establishes the principles and rules for the prevention and control of such diseases in animals which are kept by humans, wild animals and animal products. It is one of the umbrella acts of EU legislative framework for food production based on the “One Health” approach. Emphasis is placed on disease prevention through biosecurity, surveillance and traceability. It applies to live animals, germinal products, animal by-products and products of animal origin produced in both the EU and exported from third countries into the EU. It also covers facilities, transport means and equipment which may be involved in the spread of disease.	The Plan should have regard for this Regulation in respect of disease control and prevention.
Commission Delegated Regulation supplementing the Animal Health Law Regulation ((EU) 2016/429)	Commission delegated regulation which supplements the Animal Health Law Regulation (EU) 2016/429.	The legislation has introduced changes to requirements for the export of various commodities to the EU and Northern Ireland with a need for some Export Health Certificates with the aim of facilitate certification or trade.	The Plan should have regard for this Regulation in respect of disease control and prevention.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
National			
Biodiversity Strategy for Northern Ireland to 2020	A strategy for Northern Ireland to meet its international obligations and local targets to protect biodiversity	The strategy sets out the proposals for action to help halt the loss of biodiversity and the degradation of ecosystems up to 2020. 1. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society 2. Reduce the direst pressures on biodiversity and promote sustainable development 3. To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity 4. Enhance the benefits to all from biodiversity and ecosystem services 5. Enhance implementation through participatory planning, knowledge management and capacity building.	Environmental protection objectives of the Regulations are reflected in the SEOs for Biodiversity, Flora and Fauna. Successful implementation of the Plan should promote maintenance and, where possible, enhancement of biodiversity.
UK Biodiversity Framework 2024	This has been developed in response to the Kunming-Montreal Global Biodiversity Framework. It supersedes the previous UK Post-2010 UK Biodiversity Framework which had been developed following agreement of the Convention of Biological Diversity and the Strategic Plan for Biodiversity 2011-2020 and the 'Aichi targets'.	The Framework demonstrates how the work of the four countries and the UK contributes to achieving the Aichi Targets, and identifies the activities required to complement the country biodiversity strategies in achieving the Targets. This framework aims to refresh the broad-enabling structure of the previous framework. The following are the objectives of the Framework: • Protecting and restoring nature; • Sustainable use and resource management; and • Mainstreaming and Finance, to address inter-related crises of biodiversity loss and	Environmental protection objectives of the Framework are reflected in the SEOs for Biodiversity, Flora and Fauna. Successful implementation of the Plan should promote maintenance and, where possible, enhancement of biodiversity.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		climate change to enact transformational change.	
UK National Biodiversity Strategy and Action Plan: Blueprint for halting and reversing biodiversity loss	The UK National Biodiversity Strategy and Action Plan (NBSAP) for 2030 draws on the commitments made by the UK and the UK's Overseas Territories and Crown Dependencies to summarise and emphasise the collective ambitions and determination to address biodiversity loss. The UK NBSAP commits the UK to achieving all 23 of the Kunming-Montreal Global Biodiversity Framework targets.	There are four key themes and objectives under the NBSAP which aim to improve biodiversity and recover nature. This includes: • Defining the UK response to the Global Biodiversity Framework; • Driving implementation of the Global Biodiversity Framework within the UK; • Supporting international efforts to conserve nature; and • Monitoring implementation of the Global Biodiversity Framework.	Environmental protection objectives of the NBSAP are reflected in the SEOs for Biodiversity, Flora and Fauna. Successful implementation of the Plan should promote maintenance and, where possible, enhancement of biodiversity.
The Wildlife (NI) Order 1985 and amendment The Wildlife (Amendment) (Northern Ireland) Order 1995	These Orders prohibits the intentional killing, taking or injuring of certain wild birds and wild animals or the intentional destruction, uprooting or picking of certain wild plants.	These Orders aim to avoid harm to protected plant and animal species. This may require the use of mitigation measures and/or conditions may be required to ensure protection of valuable habitats and species.	Environmental protection objectives of the Regulations are reflected in the SEOs for Biodiversity, Flora and Fauna. The Plan should have regard for the Orders and the potential implementation of the wildlife intervention options.
Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995, and amendment Regulations	These Regulations give effect to Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) and the Minister to designate special areas of conservation (endangered species and habitats of endangered species) as a contribution to an EU Community network to be known as NATURA 2000. See EU Habitats Directive.	Protects certain birds, plants, animals, marine life and their habitats, including Natura 2000 sites, through creating criminal offences and changing planning requirements.	Environmental protection objectives of the Regulations are reflected in the SEOs for Biodiversity, Flora and Fauna. The Plan should ensure that European Sites are suitably protected from loss or damage. Appropriate Assessment is being undertaken for the Plan, to ensure that its implementation will not adversely affect SPAs and SACs.
Wildlife and Natural Environment Act (Northern Ireland) 2011	Amended the Wildlife (Northern Ireland) Order 1985 by giving protection to a wider range of plants, animals and birds, and providing additional enforcement powers and increased	Provides greater protection for a wider range of species and further the conversation of biodiversity.	The Plan will have a 'Duty of Care' to conserve biodiversity.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
	penalties for wildlife related offences. The Act also introduced a statutory duty on all public bodies to further the conservation of biodiversity.		Environmental protection objectives of the Act are reflected in the SEOs for Biodiversity, Flora and Fauna.
The Environment (Northern Ireland) Order 2002	Covers several environmental issues, including pollution prevention control, assessment and management of air quality, and designation of areas of special scientific interest (ASSIs).	Introduced further measures on the protections of ASSIs and the management of pollution	Environmental protection objectives of the Regulations are reflected in the SEOs for Biodiversity, Flora and Fauna, and for Air Quality.
DAERA Conservation Management Plans for SACs (in prep.)	Series of Management Plans for SACs in Northern Ireland, determining the pressures and threats to habitats and species at the sites, and identifying the management actions required to address these pressures. As of March 2025, 45 Management Plans were available.	In line with obligations under The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended), measures must be put in place to maintain and, where needed, improve the ecological health of NI SACs (58 no.) In 2017, NIEA began a 4-year work programme to develop a series of Management Plans.	The Plan should ensure that European Sites are suitably protected from loss or damage, regarding the information provided in these Conservation Management Plans. Environmental protection objectives to protect European designated sites are reflected in the SEOs for Biodiversity, Flora and Fauna.
Northern Ireland Species and Habitat Action Plans	Northern Ireland Species and Habitat Action Plans are published to assist delivery of the Northern Ireland Biodiversity Strategy, for the protection and enhancement of Northern Ireland Priority Species populations and areas of Priority Habitats which in turn supports Nature Recovery Networks and Green Growth Strategies.	A wide range of actions for these habitats and species continues to be undertaken, e.g. through the management of designated sites, planning regulation, agri-environment schemes and grant-aided projects, but have not been specifically designed to fully implement these action plans or any overarching Habitat and Species Action Plan.	Environmental protection objectives to protect European designated sites and species are reflected in the SEOs for Biodiversity, Flora and Fauna.
The Draft NI Peatland Policy	The Northern Ireland Peatland policy strategy identifies the ecosystem services provided by peatlands and their importance. It notes that peatlands are damaged and require a collaborative management approach to achieve restoration.	The Peatland strategy sets out a series of strategic objectives and actions designed to achieve recovery and restoration within peatlands.	The Plan should have regard for the policy strategy and ensure that the objectives and actions of the strategy can be achieved.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
The Environmental Protection (Restriction on Use of Lead Shot) Regulations (NI) 2009	Regulations preventing the use of lead shot around areas of importance for waterfowl as determined through the Ramsar Convention with the use of shooting via a shot gun.	The Regulation prevents the use of lead shot for the purposes of shooting with a shot gun on or over wetlands. This includes areas designated under the Ramsar Convention and can include areas which are wetlands or peatlands which may either be temporary or permanent or artificial or natural.	The Plan should have regard for this Regulation.
UK National Air Pollution Control Programme (NAPCP) 2019	Programme required under The National Emission Ceilings Regulations 2018. The NAPCP sets out how the UK can meet the legally binding 2020 and 2030 emission reduction commitments.	• Emission reduction commitments apply for 5 pollutants: nitrogen oxides, ammonia, non-methane VOCs, particulate matter and sulphur dioxide. • Policies and Measures (PaMs) are included for agriculture, including: Funding for low emission equipment; Regulation to reduce urea-based fertiliser emissions and regulation to reduce emissions from fertiliser use; Requiring covers on slurry & digestate, stores and requiring spreading by trailing hose, trailing shoe or injection; Incorporation of manures within 12 hours; Mandatory standards for livestock housing; Environmental permitting for dairy & intensive beef units.	Environmental Protection Objectives are reflected in the SEOs for Air Quality.
Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007	The Air Quality Strategy sets out air quality objectives and policy options to improve air quality in the UK from current to long term. As well as direct benefits to human health, these options are intended to provide important benefits to quality of life and to help protect the environment.	The Strategy sets out the UK Government and devolved administrations' air quality objective and the measures selected to achieve desired improvements in air quality. The overall aim is a steady decrease in ambient levels of pollutants towards the objectives over the period of implementation. These objectives are a statement of policy intentions or targets and are not legally binding in themselves. The main sources, hazards and strategy's objectives are provided for the following pollutants: particulate matter, oxides of	These environmental protection objectives are reflected in the SEOs for Air Quality.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		nitrogen, ozone, sulphur dioxide, polycyclic aromatic hydrocarbons, benzene, 1,3-butadiene, carbon monoxide, lead and ammonia.	
Air Quality Standards Regulations (Northern Ireland) 2010, and amendments (2017)	Transpose the EU Air Quality Directives and place a duty on the NI government departments to monitor levels of air pollutants specified in the Air Quality Directives and ensure compliance with limit values for these pollutants.	Designate zones in which ambient air will be protected by limiting the concentration of pollutants within them.	The Plan should have regard for the environmental protection objectives of the Regulations, particularly those relating to secondary particulate matter precursor, and cumulative effects of pollutants on air quality.
The Pollution Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) 2013, and amendments up to 2018	Transpose Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control).	The Regulations revoked 18 sets of previous regulations relating to industrial emissions and consolidated all the provisions of the Industrial Emissions Directive into a single set of regulations. They control the operation of any installation or mobile plant that carries out activities listed in Part 1 of Schedule 1 to the Regulations.	The Plan should have regard for the environmental protection objectives of the Regulations, in terms of cumulative emissions affecting air quality.
Clean Air Strategy for Northern Ireland – A Public Discussion Document, 2020	Discussion document in advance of developing the first Clean Air Strategy for Northern Ireland.	Presents evidence and research on a range of ambient air pollutants and outline policy and legislation currently in place to control air pollution.	The Plan should have regard for Environmental Protection Objectives of this strategy.
DAERA Science Strategy Framework 2020-2035	The Framework will guide how DAERA can optimise its use of science to help deliver Departmental and Programme for Government objectives, as part of the Science Transformation Programme.	The Framework: • Outlines a Vision for DAERA science; • Defines high level principles to be adopted; • Describes the desired end-state goals to be achieved in terms of providing leadership, understanding needs, optimising investment in resources and having effective governance.	The Science Strategy Framework will support the policies of the Plan.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		It then defines objectives to reach the goals in terms of: • Providing better leadership for science; • Becoming more intelligent customers of science; • Better targeting of science funding; • Pursuing value for money; and Ensuring impact of science products.	
The Control of Noise at Work Regulations (Northern Ireland) 2006	This Regulation controls the minimum health and safety requirements regarding the exposure of workers to the risks arising from noise. It places duties on employers and on self-employed persons to both employees who may be exposed to risk from the exposure to noise at work and how other people at work who might be affected.	The Regulations establish set limits for exposure levels to noise both on lower exposure and upper exposure action levels and set exposure limits for daily or weekly personal noise exposure and peak sound pressure. A programme of measures is also established regarding actions to be taken to reduce noise exposure as far as practicable possible as well as the need for health surveillance.	The Plan should have regard for these Regulations within its implementation.
Northern Ireland State of the Environment Report 2013	The second report on the State of the Environment in Northern Ireland brings together recent information on how the NI environment is performing across land, water, sea and air.	Updates the first state of the environment report and provides commentary on 44 environmental indicators across 8 themes. The report draws together in one place an overall picture of our environment and identifies cross-cutting issues.	Provides environmental baseline information on which the Plan could have impacts upon.
Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004	Implements the SEA Directive (2001/42/EC) in Northern Ireland. To provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development.	See SEA Directive.	The Plan will be subject to the SEA process. This is being undertaken through this Scoping Report and subsequent Environmental Report.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
Northern Ireland Executive Programme for Government 2024-2027	The Programme for Government identifies the actions the Executive stated purpose – Improve wellbeing for all – by tackling disadvantage, improving health and wellbeing, and driving economic growth.	List of Programme for Government Outcomes • Grow a Globally Competitive and Sustainable Economy • Deliver more affordable, accessible, high-quality learning and childcare • Cut health waiting times • Ending violence against women and girls • Better support for children and young people with special educational needs • Provide more social, affordable and sustainable housing • Safer communities • Protecting Lough Neagh and the environment • Reform and transformation of public services	The Plan will have regard to this programme and will (in combination with other users and bodies) cumulatively contribute towards the achievement of the objectives of this programme.
The Regional Development Strategy 2035 – Shaping Our Future - Updates the Regional Development Strategy for Northern Ireland 2025	The 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.	The over-arching vision of the Regional Development Strategy is: "An outward-looking, dynamic and liveable Region with a strong sense of its place in the wider world; a Region of opportunity where people enjoy living and working in a healthy environment which embraces the quality of their lives and where diversity is a source of strength rather than division. " The aims of the RDS 2025 remain valid: • Support strong, sustainable growth for the benefit of all parts of Northern Ireland • Strengthen Belfast as the regional economic driver and Londonderry as the principal city of the North West • Support our towns, villages and rural communities to maximise their potential. • Promote development which improves the health and well-being of communities.	The Plan will consider land use changes and spatial planning impacts.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		• Improve connectivity to enhance the movement of people, goods, energy and information between places. • Protect and enhance the environment. • Take actions to reduce our carbon footprint and facilitate adaptation to climate change. Strengthen links between north and south, east and west, with Europe and the rest of the world	
UK Sustainable Development Strategy, Agenda 21	The 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.	The over-arching vision of the Regional Development Strategy is: "An outward-looking, dynamic and liveable Region with a strong sense of its place in the wider world; a Region of opportunity where people enjoy living and working in a healthy environment which embraces the quality of their lives and where diversity is a source of strength rather than division. " The aims of the RDS 2025 remain valid: • Support strong, sustainable growth for the benefit of all parts of Northern Ireland • Strengthen Belfast as the regional economic driver and Londonderry as the principal city of the North West • Support our towns, villages and rural communities to maximise their potential • Promote development which improves the health and well-being of communities • Improve connectivity to enhance the movement of people, goods, energy and information between places • Protect and enhance the environment	The Plan should have regard for the environmental protection objectives of this strategy.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		• Take actions to reduce our carbon footprint and facilitate adaptation to climate change • Strengthen links between north and south, east and west, with Europe and the rest of the world.	
10X Economy – An Economic Vision	In May 2021, the Department for the Economy launched its economic vision for the next 10 years, called 10x Economy - an economic vision for a decade of innovation.	The concept embraces innovation to deliver a ten times (10X) better economy with benefits for all the people of Northern Ireland. Ten guiding principles have been identified to underpin this vision and a number of these are central to agriculture, such as delivering positive economic, environmental and societal outcomes; supporting a greener, sustainable economy; position Northern Ireland amongst the most competitive small advanced economies in the world; and focusing on increasing innovation in high value-added areas and priority clusters. "*Agri-Tech"* has been identified as one of the priority sectors.	The Plan should have regard for the environmental protection objectives of the vision.
Sustainability for the Future – 'DAERA's Plan to 2050'	Sustainability for the Future, published in May 2021, presents DAERA's strategic priorities up to 2050.	The Plan outlines the following strategic priorities: • To enhance our food, forestry, fishery and farming sectors using efficient and environmentally sustainable models which support economic growth; • To protect and enhance our natural environment now and for future generations whilst advocating its value to and wellbeing for all; • To champion thriving rural communities that contribute to prosperity and wellbeing; and	Future agricultural policy has a significant role in delivering against these priorities and is underpinned by our purpose of '*Sustainability at the heart of a living, working, active landscape valued by everyone'*. The Plan will have regard for the Environmental Protection Objectives of this Plan.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		• To be an exemplar, people focused organisation, committed to making a difference for the people we serve.	
Draft Green Growth Strategy for Northern Ireland	Green Growth is an over-arching multi-decade Strategy, led by DAERA, which sets out the long-term vision and a solid framework for tackling the climate crisis by balancing climate action with the need for a clean, resilient environment and economy. It has been developed by all Ministers and Government departments working together, in collaboration with external stakeholders from local government, the private sector, voluntary and community sectors and others.	The cross-cutting strategy will be delivered through a series of Climate Action Plans, which will set out the actions to meet sector-specific greenhouse gas emission targets to deliver a cleaner environment rich in biodiversity; delivering a more efficient use of resources within a circular economy; and green jobs.	The Plan should have regard for the action plans established under this strategy.
Northern Ireland Food Strategy Framework	DAERA has been leading on the development of a Northern Ireland Food Strategy Framework. This Framework has been developed collaboratively with officials across Northern Ireland Departments and other interested parties and is complementary to the Agricultural Policy Framework, extending issues relating to food production and consumption out into other areas of government policy.	The Food Strategy Framework recognises the interconnectedness between food, health, the economy and the environment. It proposes a new strategic food systems approach for Northern Ireland, and sets out a long-term vision, high level principles and areas for strategic focus. The vision is a transformed food system that protects natural resources for future generations, is economically and environmentally sustainable and provides safe, nourishing, accessible food to people, who make informed healthy choices.	The NI Food Strategy is complementary to the Plan.
Draft Environment Strategy for Northern Ireland	This strategy aims to deliver a coherent and effective series of interventions which can deliver improvements in the environment quality and overall health and wellbeing of population.	Improvements in the environment aims to promote improved health and wellbeing as well as increasing the opportunities available through the economy and contribute to global environmental protections.	The Plan should have regard for the environment objectives of this strategy.
Rural Policy Framework for Northern Ireland	The overall aim of the policy framework is to create a sustainable rural community where people want to live, work and be active.	The framework comprises five key thematic pillars, and nineteen associated priority interventions. The thematic pillars are: • Innovation and entrepreneurship;	Successful implementation of the Plan will contribute towards the achievement of the objectives of the framework.

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
		• Sustainable tourism; • Health and wellbeing; • Employment; and • Connectivity	
Northern Ireland Energy Strategy 2050	In June 2019 the UK became the first major economy to commit to a 100 per cent reduction in greenhouse gas emissions by 2050. This 'net zero' target represents a significant step-change in the commitment to addressing the climate crisis. This Northern Ireland Energy strategy 2050 will seek to meet this commitment.	The Department for the Economy has begun the process of developing a new energy strategy to decarbonise the Northern Ireland energy sector by 2050 at least cost to the consumer. A new energy strategy will be published by the end of 2021.	The Plan should have regard for the emission targets of this strategy.
Strategic Planning Policy Statement for Northern Ireland	The Strategic Planning Policy Statement establishes the Department of Infrastructure's regional planning policies for the development of land under the two-tier planning system of Northern Ireland. The statement must be taken into consideration in the preparation of Local Development Plans which supersede Planning Policy Statements.	The Strategic Planning Policy Statement aims to ensure that the sustainable and appropriate development of Northern Ireland's land occurs.	The Plan should have regard for the planning policies of the Strategic Planning Policy Statement with regard to its implementation.
Planning Policy Statement 2 'Natural Heritage'	This Planning Policy Statement sets out the policies of DAERA regarding aspects of land-use planning across NI in relation to natural heritage.	The Planning Policy Statement aims to ensure that planning policies aim for the conservation, protection and enhancement of natural heritage which includes the diversity of our habitats, species, landscapes and earth science features.	The Plan should have regard for the planning policies of the statement regarding any measures implemented in respect of planning as no farm to a European protected species is permissible under this and only under exceptional circumstances may this be granted. Consideration must also be given to nationally protected species with development proposals designed to be sensitive to these species and their habitats.
Northern Ireland Waste Management Strategy, 2012	The Waste Management Strategy sets out in detail those proposed policies, including specific actions to be taken. Strategy development is a continuous process and the Waste Management	The proposals of this Strategy are as follows: • The development of a Waste Prevention Programme;	The Plan should have regard for the environmental protection objectives of this Strategy, regarding waste produced.

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	Strategy for Northern Ireland is considered as a living document, requiring regular review and revision to ensure that it remains relevant and the policies and actions therein remain appropriate.	• A new 60% recycling target for local authority collected municipal waste (LACMW); • The introduction of a statutory requirement on waste operators to provide specified data on commercial and industrial waste; • New and more challenging collection and recycling targets for packaging and WEEE; • The introduction of a landfill restriction on food waste; • The potential for the devolution of landfill tax; • The implementation of legislation on carrier bags; The development of detailed proposals for an Environmental Better Regulation Bill.	
Waste Management Plan 2013 – 2020	The Waste Management Plan 2013-2020 outlines how it will efficiently manage waste for the Councils it represents with the overall goal of creating a system that 'meets the region's needs and contributes towards economic and sustainable development'. Subject to review every five years the Plan details how NI will fulfil its statutory obligations under the EU Waste Framework Directive and The Waste and Contaminated Land (Northern Ireland) Order 1997.	The Action Plan proposes to: • Deliver a communications campaign to build public awareness, understanding of and confidence in recycling. • Undertake a Recycling Gap study to identify kerbside recycling options. • Provide £2.5m to the Rethink Waste Capital fund in 2016/17 with further government support planned for successive years. • Support the development of strategic infrastructure for treating and recovering waste; and • support separate treatment of food waste	The Plan should have regard for the environmental protection objectives of this Plan, regarding waste produced.

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Tuberculosis Control Order (Northern Ireland) 1999	This legislation aims to control the spread of Tuberculosis for both bovine and non-bovine animals.	The legislation establishes the legal requirements surrounding the notification of TB disease to authorities and precautions to be taken to control the spread of infection and disease, including disinfection, the management of carcasses, the control of affected manure and slurries, slaughter and compensation rates.	The Plan should have regard for the legislative requirements surrounding TB disease, notification, control and prevention.
Environmental Noise Regulations (Northern Ireland) 2006	These Regulations are required under the Environmental Noise Directive 2002/49/EC which aims to determine population noise exposure through mapping, have information available on noise to the public and based on noise maps develop action plans surrounding noise.	The Regulations have led to the publication of strategic noise maps for the main sources of environmental noise such as roads, railways, airports and industry in certain population areas.	The Plan should have regard for the noise requirements and strategic noise areas under the Regulations.
Environmental Noise (Amendment) Regulations (Northern Ireland) 2018	These Regulations implement the Commission Directive (EU) 2015/996/EC regarding common noise assessment methods.	These Regulations relate to the assessment and management of environmental noise and the production of noise maps and action plans.	The Plan should have regard for the noise requirements and strategic noise areas under the Regulations.
Noise Emission in the Environment by Equipment for use Outdoors (Amendment) (Northern Ireland) Regulations 2025	These Regulations update the methods by which airborne noise is tested for equipment. This is to ensure that legislation remains at pace with technological advancements.	The Regulations include new testing measures for certain types of outdoor machinery to control the noise generated by these and establish permissible noise limits.	The Plan should have regard for the maximum permissible noise limits for outdoor equipment.
The Pollution Control and Local Government (NI) Order 1978	This legislation has largely been revoked in Northern Ireland however Part 2 – Waste on Land remains in force.	Part 2 - Waste on Land remains in force in NI and surrounds the following issues of waste disposal arrangements, licensing of the disposal of controlled waste, and waste other than controlled waste.	The Plan should have regard for the parts of the legislation regarding the disposal of waste.
Clean Neighbourhood and Environment Act (NI) 2011	This Act provides local councils the powers to improve the quality of the local environment.	Amongst other areas, the Act provides councils with additional powers to address noise and statutory nuisance.	The Plan should have regard for the objectives of the Act in relation to noise generation.
Republic of Ireland			

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
National Biodiversity Action Plan 2023-2030	Sets out Ireland's Vision for Biodiversity, in response to the requirements of the UN Convention of Biological Diversity 1992 (Article 6).	• The first Biodiversity Action Plan (BAP) was prepared by the Department of Arts, Heritage and the Gaeltacht, subsequently revised in 2011. • The aims are to achieve Ireland's Vision for Biodiversity through addressing issues ranging from improving the management of protected areas to increasing awareness and appreciation of biodiversity and ecosystem services. • Ireland's fourth iteration of the BAP for conserving and restoring Ireland's biodiversity covers the period 2023-2030.	Environmental protection objectives of the Plan are reflected in the SEOs for Biodiversity, Flora and Fauna. The Plan should have regard for the aims of the Biodiversity Action Plan.
Bovine TB Action Plan	The action plan aims to address the increases in bTB levels within Ireland with 30 actions based on scientific research, evidence and veterinary expertise.	The action plan is formulated across five main areas: • Support the maintenance of bTB free herds. • Reduce the impacts of wildlife on the spread of bTb. • Where bTB breakdowns occur within a herd, detect and eliminate bTB infections rapidly to prevent future breakdowns. • Improve on-farm biosecurity. • Reduce the impact of known high-risk animals spreading bTB.	The Plan should have regard for the ROI Bovine TB Action Plan regarding the potential for guidance on research and best working practices.
Regional			
Local Biodiversity Action Plans (LBAPs)	Local Biodiversity Action Plans are a way of encouraging people to work together and deliver a programme of continuing action for biodiversity at a local level.	Local Biodiversity Action Plans set out practical steps that aim to help protect biodiversity, enhance and improve biodiversity where possible, and promote biodiversity at a local level	The Plan will have regard for these local plans. SEOs for Biodiversity, Flora and Fauna should contribute towards the

Plan / Programme	High Level Description	Key Objectives, Actions etc.	Relevance to the Plan
			Environmental Protection Objectives of LBAPs.