



FOOD WISE 2025

Strategic Environmental Assessment
Environmental Report
Non Technical Summary

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Strategic Environmental Assessment **Environmental Report - Non-Technical Summary**

Prepared on behalf of

The Department of Agriculture, Food and the Marine

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Acronyms/Abbreviations

AA	Appropriate Assessment
CAP	(EU) Common Agricultural Policy
DAHG	Department of Arts, Heritage and the Gaeltacht
DAFM	Department of Agriculture, Food and the Marine
DCENR	Department of Communications, Energy and Natural Resources
DECLG	Department of the Environment, Community and Local Government
EEZ	Exclusive (Marine) Economic Zone
EFZ	Exclusive Fishing Zone
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
GAEC	Good Agricultural and Environmental Condition
GHG	Greenhouse Gases
NBDC	National Biodiversity Data Centre
NIS	Natura Impact Statement
NOx	Nitrogen Oxides
NPWS	National Parks and Wildlife Service
RBMP	River Basin Management Plan
RDP	Rural Development Programme
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SPA	Special Protection Areas
WTO	World Trade Organisation

1 Introduction

1.1 Purpose of this Report

This Non-Technical Summary (NTS) provides an overview of the Environmental Report produced as part of the Strategic Environmental Assessment (SEA) of *Food Wise 2025* which is being prepared by the Department of Agriculture, Food and the Marines (DAFM). This NTS should be read in conjunction with the Environmental Report. It describes *Food Wise 2025* itself, outlines the SEA process and summarises the likely significant environmental effects anticipated as a result of the implementation of *Food Wise 2025* (and the reasonable alternatives). This NTS also sets out the next steps in the SEA process including proposals for monitoring the implementation of the strategy.

The assessment, Environmental Report and Non-Technical Summary have been completed by Philip Farrelly & Co Ltd. on behalf of the DAFM.

1.2 The Strategy

Food Wise 2025 will be a successor to previous plans for the agri-food sector. The most recent of these plans is *Food Harvest 2020* which was published in 2010 (DAFM, 2010).

The preparation of *Food Wise 2025* has been undertaken at the instigation of the Minister for Agriculture Food and the Marine, Mr Simon Coveney TD. In the autumn of 2014, the Minister established a committee representative of primary production, processing, marketing, retailing, research, and governance under the chairmanship of John Maloney, a prominent agri-food industry leader. The committee was asked to ‘set out *the key actions required to maximise the contribution of the sector to economic growth, job creation and environmental sustainability over the next decade*’.

1.3 The Context of *Food Wise 2025*

The strategy is being prepared against a background of structural and income problems at the farm level; and an ever increasing pace of technological advancement within the agri-food sector.

The agri-food industry is the main indigenous industry in Ireland. The industry uses Irish raw materials, is predominantly in Irish ownership and its activities are undertaken geographically widely across the country.

The agri-food industry in Ireland currently provides employment for 163,000 people, with food and beverage manufacturing enterprises accounting for €26 billion of total turnover, comprising 26% of all manufacturing turnover and generating 12.7% of total merchandise exports. The sector accounts for 7.2% of Gross Value Added (GVA) at factor cost and 8.4% of total employment. At primary production level, some 140,000 farm families are involved in production of output valued at more than €7 billion. Together the beef and dairy sectors account for more than 70% of this output value.

Side-by-side with its economic and social role the agri-food industry plays a significant role across a diverse range of environmental media. In particular activities at primary production level have a

significant influence on water quality, biodiversity, air quality, soils and landscape. Agricultural activities play a crucial role in meeting Ireland's international obligations for water and air quality and in maintaining a healthy and diverse landscape.

1.4 The Structure of *Food Wise 2025*

1.4.1 International Context

As a background to preparing the strategy the committee studied the global macroeconomic situation and the EU policy framework under which the industry operates. The challenges associated with international climate change policy; the United Kingdom's relationship with the European Union; exchange rate fluctuations; energy price volatility; and geopolitical instability were considered. Changes in the terms of trade and product mix required as a result of international trade negotiations, demographic trends and changing dietary preferences were also examined.

1.4.2 National Context

At a national level the committee noted the resilience of the sector through the recent economic recession and pointed to the importance of the sector to future stability and growth particularly in rural areas of Ireland. An analysis of the sector examining its strengths, weakness, opportunities and threats was carried out to set the context and form a basis for the development of the future strategy.

1.4.3 Sustainability

From the outset the strategy was prepared in the knowledge that:

- Ireland's agri-food sector through its farmers, fishermen and forestry owners manages the vast majority of the natural resources in Ireland;
- Ireland faces significant challenges in meeting some national and international environmental targets for air quality, biodiversity and water quality;
- Meeting Greenhouse Gas (GHG) and ammonia emission reduction targets will be particularly challenging; and
- The continued growth of the agri-food sector must be based on sustainable intensification, a concept included in the conclusions of the October 2014 EU Council on the 2030 EU Climate and Energy Policy Framework.

The strategy states *"Sustainable intensification leverages the strengths of the sector by improving productivity while using natural resources in a manner which protects them into the future. This will require the ongoing strong commitment of the sector to adapt through embracing and applying the latest innovations, new technologies and processes."*

In order to address the above the strategy has adopted as a guiding principle that *"... environmental protection and economic competitiveness will be considered as equal and complementary, one will not be achieved at the expense of the other."*

In recognition of this the following recommendations/actions were developed:

- Recognising agriculture's role in ongoing national, EU and international climate change and energy policy development;
- Measurement of Ireland's environmental sustainability credentials;
- Further development and enhancement of Origin Green programme;
- Improvement of environmental footprint of the sector;

- Develop and support agri-food processing sector in delivering sustainable processes and outputs;
- Implementation of environmental elements of Ireland's national programmes and the EU co-funded Rural Development Programme 2014-2020; and
- Prioritise research funding on sustainability of Irish food production.

1.4.4 Growth Opportunities

Opportunities for growth taking into account global demand and consumers trends across all the sectors are examined under the following headings:

Global Food Demand, Demographics & Economic Prosperity

Changes in global demographics and prosperity are driving demand for safe, health enhancing, sustainably produced high quality food.

While EU markets, in particular the UK, are predicted to be the largest destinations for agri-food exports up to 2015, positive economic developments in regions such as China, South East Asia, the Middle East and Africa are driving a rapidly growing demand for quality safe foods.

Consumer Trends

Changes in consumer trend under the headings of health and wellness, convenience foods, new retail routes, consumer preference, food identity, building trust chains, and the squeeze on middle market brands are examined. The speed of evolving consumer trends is seen as playing to Ireland's agri-food strengths for producing high quality, safe, nutritious and sustainable food. The strategy calls for continued innovation and consumer product development to take full advantage of these trends.

1.4.5 Sectoral Expansion

The opportunity for growth across all sectors of the agri-food industry is highlighted, with the common theme that expansion must be based on sustainability and innovation. Expansion opportunities identified include:

- In the milk sector the removal of quota's since March 2015 and the requirement for high quality food ingredients are seen as conferring particular advantage;
- Strong global demand for meat can increase margins across the sector provided there are improvements in technical efficiency, proven sustainability and innovation;
- In the Prepared Consumer Foods sector better retailer supplier relations together with investments in new technologies and R&D can deliver better margins;
- Rapid growth in worldwide consumption of fish is predicted to translate into a sustained growth within the aquaculture sector;
- The whiskey and craft beer sectors are predicted to continue their recent growth pattern;
- Improvements in technology and the development of an entrepreneurial business attitude are seen as drivers within the horticultural sector;
- Increased expansion in the forestry sector from its present base of 2.3 billion is predicted with increasing export based on Ireland's natural advantage in the production of wood fibre; and
- Growth in the tillage sector will be driven by an increased demand for animal feeds and in particular specialist crops to serve the distilling, brewing and specialist food areas.

1.4.6 Delivering Growth

The identification of opportunities for growth is followed by an analysis of the actions needed to deliver growth.

The following themes were examined:

- Human capital;
- Competitiveness;
- Innovation;
- Market development;
 - Promoting “*Brand Ireland*” in new markets;
 - Origin Green;
 - Animal health status; and
 - High food safety status.

Each subtheme was analysed and the key actions required to remove obstacles and promote sustainable development were identified.

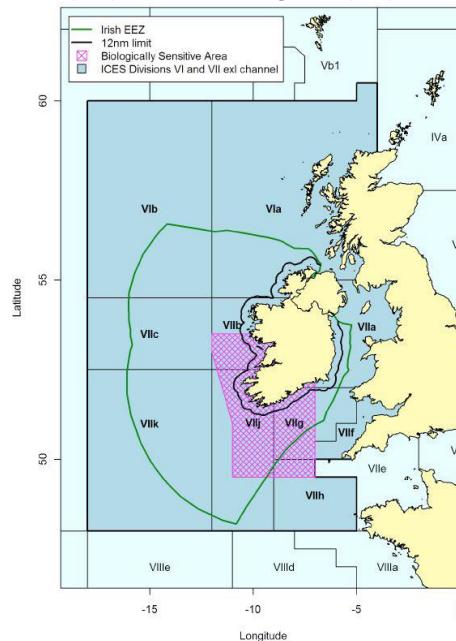
Actions targeted at relevant players including farmers, processors, researchers, advisors and agencies are suggested.

1.5 Scope of Food Wise 2025

1.5.1 Geographical

The Irish agri-food industry is comprised of the agriculture; food and beverage; fishery; fish processing; forestry; and forestry processing sectors. The agri-food sector occupies over 4.5 million hectares of the national terrestrial territory and influences all of Ireland’s estuarine, coastal and inland waters through fisheries and marine activity. *Food Wise 2025* therefore covers the entire terrestrial area of Ireland and designated Irish Exclusive Economic Zone (EEZ) as detailed in Figure A below.

Figure A - Ireland's Exclusive Economic Zone (EEZ)/Exclusive Fishing Zone (EFZ)



1.5.2 Sectors Covered

To ensure future development within the entire agri-food industry is focused on the overarching theme of sustainable intensification the strategy sets out goals and ambitions for each sector within the industry. The sectors covered are dairy, beef, sheep, pigmeat, poultry, tillage, horticulture, prepared consumer goods and alcoholic beverages, forestry and seafood.

Dairying

Drawing on a low carbon intensity grass fed production system; a strong reputation; and 130 developed markets; the dairy industry can overcome weaknesses associated with lack of scale at processing level and seasonality of production. The sector can take advantage of opportunities to move up the value chain through business-to-consumer products; the increasing affluence of third country markets and the inherent sustainability of Ireland's grass based production systems. The strategy proposes an action plan under 18 headings with the object of increasing the dairy industry's sustainability through technical improvements at farm level; increased research and knowledge transfer; and structural reforms at industry level.

Beef

Drawing on its strengths as a grass fed established herd; a strong reputation; and a credible quality assurance scheme the beef sector has the capacity to take advantage of opportunities presented by new markets; changed dietary habits; and potential advances in genomics. However the sector can overcome the problems of small scale; poor farmer demographic profile and income; and land mobility issues by ensuring animal health and reputational status can be maintained. The strategy sets out 42 actions to be undertaken by all players in the industry including farmers; processors; researchers; and advisors. Key benefits from research and knowledge transfer are targeted and actions for the state agencies concerned with the beef sector are set out.

Sheep

The sheep sector drawing on the environmental benefits conferred by a grass based production system; an already strong export market for value-added product; and a credible and certified quality assurance scheme; must overcome weaknesses associated with poor market penetration; poor age profile of farmers; low incomes; and seasonality. The sector can benefit by expanding its product range and marketing to new and ethnically diverse populations. To do this the sheep sector must protect the environment, ensure high animal health status and promote its products. To this end the strategy outlines 15 actions to harness knowledge transfer, farm improvements, marketing initiatives and targeted research.

Pigmeat

The pigmeat sector, serving a growing global and domestic market, is a highly rationalised sector with high value-add and genetic capabilities. To overcome its relatively small scale; lack of investment; high energy and feed costs to take opportunity in new and diverse markets for an already popular food the pigmeat sector must achieve scale, reduce cost, protect the environment, ensure disease control and food safety. Focusing on the potential for growth the strategy sets out 14 actions to be undertaken by farmers; processors; researchers; and state agencies.

Poultry

The poultry sector has a certifiable traceability and sustainability quality assurance scheme; and well-developed domestic and export markets for its low cost high protein food. It must overcome cheap imports; over reliance on the domestic market; high feed costs; and a failure to penetrate the domestic food service sector. If the sector achieves this, marketing to China and other export markets will increase profit margins provided there is a concentration on consolidation and increasing added-value. New disease outbreaks, cheaper imports and environmental concerns are a threat. The continued sustainable expansion of the sector is targeted through 13 actions.

Cereals and Tillage

With increased demand for nutritional food; and ingredients for the brewing and distilling industry; high yield potential and domestic demand can help the cereals and tillage sector compete for available land despite disease and technological deficits. There is an increasing demand for cereals, high value foods and protein crops provided the sector can deal effectively with increased input costs, cheaper imports and disease and environmental concerns. Seventeen actions are recommended to achieve the sectors objectives.

Horticulture

With a strong consumer base; a diverse range of products; strong domestic and United Kingdom markets; and an established and well-recognised quality assurance scheme; the horticulture sector is nonetheless small and faces organisational challenges and with limited and unprotected brands. The sector has opportunities for added-value and import substitution through retailer cooperation to increase sales in a health conscious market. The sector faces difficulties dealing with a consolidated retail sector; changing consumer preferences; lack of key skills; and maintaining high environmental credentials for a discerning consumer base. With the primary objective of maintaining and expanding the strong base the strategy sets out 17 actions for farmers and others. These actions are heavily targeted at the state agencies serving the industry.

Prepared Consumer Foods and Alcoholic Beverages

This already highly organised sector, serving established customers through iconic brands, with high traceability standards through Origin Green and ample processing capacity can overcome the problem of geographic remoteness and serve a wider market through improved innovation. The opportunity exists for further developments in consumer products and tourism. The sector is particularly vulnerable to competitiveness, regulatory and scale issues. The sector must ensure its food safety and environmental sustainability credentials. To this broad sector the strategy suggests 31 actions with the aims of improving competitiveness, increasing exports and promoting new niche entrants.

Forestry

Being highly developed the forestry sector draws on technical competence, high mechanisation, growing export demand and highly productive forest soils to increase employment and the area under forest. Innovation and research will increase carbon sequestration. Ireland has a low level of forest cover, some of which has low productivity, and a state sector which is larger than the private sector. Nonetheless the sector can increase employment, exports and afforestation. While climate change, weather events, disease and lack of funding are seen as sector weaknesses. Stressing the importance of forests as a rural employer the strategy suggests 10 actions aimed at increasing the productivity of existing forests and promoting new afforestation.

Seafood

The seafood sector with proximity to productive fishing grounds, supplying a diverse market, has a clean image and Origin Green marketing. Despite this it is of relatively small scale, lacks continuity of supply and the industry is uncompetitive and commodity driven. Fish stock recovery programmes and an increasing global demand will attract increased landings to Ireland and diversified production. Expansion is hampered by stock depletion and uncertainties in aquaculture licensing. Protection of the environment, increasing the scale and diversity of product are called for. Building on the Seafood Development Programme 2014 – 2020, three specific priorities for the industry are set and six specific actions are targeted at the sector's actors.

1.6 Strategic Environmental Assessment (SEA)

Statutory Instrument (SI) No. 435 of 2004 European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (as amended) translates European Union Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment into Irish Law. The objective of SEA, as defined in Directive 2001/42/EC, is:

'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 contributing to sustainable development.'

Throughout the course of the development of *Food Wise 2025*, the SEA sought to identify, describe and evaluate the likely significant effects on the environment of implementing the plan or programme

and to propose measures to avoid, manage or mitigate any significant adverse effects and to enhance any beneficial effects.

1.7 Methodology

The conduct of the SEA is a staged process and the requirements of SEA Directive Article 5(1) Annex 1 are summarised in Table A below.

Table A - SEA stage process

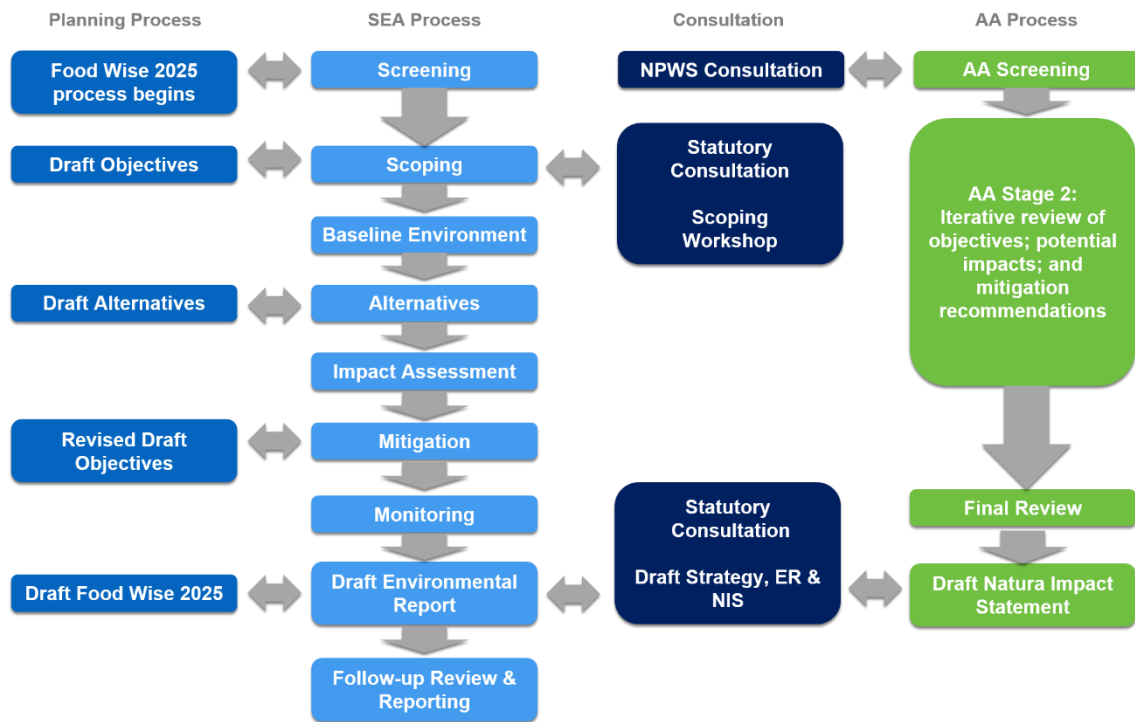
Stage	Details
Stage A - Setting the context and objectives, establishing the baseline and deciding on the scope in consultation with the statutory SEA bodies	<ul style="list-style-type: none"> Screening for the requirement for SEA Review and Assessment of Baseline Environmental Conditions; Development of Strategic Environmental Objectives; Preparation and circulation of SEA Scoping Report; Consultation on Scoping Report;
Stage B - Developing and refining alternatives, assessing the likely direct, indirect and cumulative effects of proposed options and identifying mitigating and monitoring measure	<ul style="list-style-type: none"> Development of realistic alternatives; Assessment of alternatives utilising the Strategic Environmental Objectives; Decision on Food Wise 2025 based on the alternatives assessment.
Stage C – Preparation of a draft Environmental Report	<ul style="list-style-type: none"> Review of plans and Programmes; Assessment of plan effects, cumulative and transboundary effects; Development of Mitigation and Monitoring strategies; Preparation of draft Environmental Report
Stage D - Consulting on the draft plan or programme and the Environmental Report	<ul style="list-style-type: none"> Consultation on the draft SEA Environmental Report with environmental authorities
Stage E - Post Adoption SEA Statement on how the Environmental Report and consultees' opinions were taken into account in deciding the final form of the plan or programme	<ul style="list-style-type: none"> Review of consultation outcomes; Revision of SEA Environmental Report; Finalisation of Food Wise 2025; Preparation of SEA Statement identifying the effects of the SEA process on the plan.
Stage F - Undertaking suitable monitoring of the associated impacts of the implementation of the selected options	<ul style="list-style-type: none"> Ongoing Monitoring of impacts arising from Food Wise 2025, managed and reviewed by SEA committee.

1.8 Interaction of AA/SEA Process and Formulation of *Food Wise 2025*

The objectives of the AA/SEA process is to inform the drafting of *Food Wise 2025* through early identification of potential conflicts between the strategy's draft objectives/targets and environmental protection objectives. This objective is further aided by the concurrent preparation of a Natura Impact Statement which will identify any potential conflicts between the achievement of the strategy's targets and the conservation and integrity of Natura 2000 sites.

Figure B illustrates the interactions between SEA, AA and the drafting of *Food Wise 2025*.

Figure B Schematic diagram illustrating the interactions between the SEA, AA and drafting of Food Wise 2025



2 Base Line Conditions

A critical process in the development of a Strategic Environmental Assessment is the identification of the environmental baseline conditions. It is only by understanding the receiving environment, that potential impacts arising from a plan or programme can be properly assessed, mitigated and monitored.

The SEA Directive requires that the evolution of the baseline conditions of the plan area (that would take place without the plan or programme) is identified.

The *Food Wise 2025* SEA Scoping Report provided an assessment of baseline conditions. The baseline conditions for the purposes of this SEA cover the entire jurisdiction of Ireland in addition to estuarine and marine waters around the Irish coastline. For the purposes of understanding the environmental baseline at an appropriate scale the environment was considered under the following headings:

- Population and Human Health;
- Biodiversity, Flora and Fauna;
- Air Quality and Climate Change;
- Water (Surface Water, groundwater and Drinking Water);
- Soils and Geology;
- Landscape;
- Materials Assets;
- Cultural Heritage (including Archeology);
- Inter-relationships

Table B provides for each environmental heading, in summary form, an overview of the baseline condition, the existing environmental problems relevant to each environmental heading and its predicted evolution the absence of the *Food Wise 2025*.

Table B Summary of Baseline, existing problems and evolution in absence of the Plan

Environmental Characteristic	Overview	Existing Problems	Evolution in the absence of Plan
Population and Human Health	<p>Population density is unevenly distributed across the country.</p> <p>Human health is dependent upon a healthy diet and clean healthy environment including biodiversity, water quality and air quality.</p> <p>Human wellbeing is dependent on economic factors including targeted income supports.</p>	<p>Impacts on human health are relevant across all the environmental media. Water quality, particularly drinking water, is closely interrelated with human health.</p> <p>Agricultures role in food safety, air quality, the prevention of contamination and the creation of nuisance through noise and smell are relevant.</p> <p>Low incomes and economic disadvantage are also identified.</p>	<p>In the absence of the Plan proposed measures for the protection of water quality, air quality, the enhancement of bio-diversity and initiatives on food safety might not materialise.</p> <p><i>Food Wise 2025</i> proposes economic viability at farm level as a key priority, the absence of which might result in further depopulation in rural areas.</p>
Biodiversity, Flora and Fauna	<p>Irish legislation and Regulation primarily derive from:</p> <ul style="list-style-type: none"> ▪ The Birds Directive 2009/147/EC (EC, 2009) ▪ The Habitats Directive 92/43/EEC (EC, 1992); and ▪ The Water Framework Directive 2000/60/EC <p>As primary agriculture, forestry and fisheries operates throughout the entirety of the national territory, it necessarily interacts with the bio-diversity flora and fauna and in many instances the two are inter-dependent. Natura 2000 sites are protected habitats for flora and fauna. Within Natura sites there are Special Areas of Conservation (SAC) designated under the Habitats Directive and Special Protection Areas (SPA) designated under the Birds Directive.</p>	<p>Primary production activities are associated with many existing concerns, particularly in the areas of farmland birds, pollinators, fresh water mussel, other fish species, and the effects of ammonia deposition.</p> <p>Encroachment through intensification on Nature 2000 sites and land abandonment are highlighted as potential existing problems.</p>	<p>In the absence of the plan, there is a danger that uncontrolled increases in livestock numbers may lead to encroachment through intensification on Natura 2000 sites.</p> <p>Nutrient runoff from lands could lead to deterioration of aquatic habitats in the absence of improved knowledge transfer targeted in the Plan.</p> <p>Protection of pollinators, farmland birds and Natura 2000 sites might be of greater risk in the absence of monitoring and mitigation measures proposed in the plan.</p>

Environmental Characteristic	Overview	Existing Problems	Evolution in the absence of Plan
	Regulations at primary production level reflect conservation objects specifically with regard to the protection and enhancement of bio-diversity flora and fauna.		
Air Quality and Climate Change	<p>National air quality and climate change targets and regulations are derived from:</p> <ul style="list-style-type: none"> EU Directive 2008/50/EC; and EU Directive National Emissions Ceiling Directive 2001/81/EC. <p>In addition ammonia emissions are regulated through Ireland's membership of the Gothenburg Protocol.</p> <p>The EPA is responsible for measurement and implementation of air quality standards.</p> <p>While air quality is generally described as good (EPA 2013c) concerns do exist particularly in relation to ammonia, particulate matter, noise and odour.</p> <p>While Ireland is on target to meet its compliance obligations for the period 2013 to 2020 under the UN Convention on Climate Change it is of concern that the country is expected to exceed the individual year targets for 2018 to 2020.</p>	<p>Ireland faces existing problems meeting ammonia targets for the period to 2020 under the Gothenburg Protocol. There is concern that depositions of ammonia in Natura 2000 sites may be resulting in exceedance of critical loading of nitrogen thus impacting negatively on biodiversity and flora and fauna.</p> <p>GHG levels are directly linked to livestock numbers and concerns exist that Ireland will have difficulty meeting targets to be set for the period beyond 2020. Ammonia emissions are linked to formation of PM_{2.5} which has direct human health implications.</p>	<p>Unplanned increases in livestock numbers which might occur in the absence of the plan are deemed to present a serious threat to Ireland's ability to meet GHG, air quality and ammonia targets in the period to 2020 and beyond to 2050.</p> <p>Monitoring of livestock numbers, GHGs and ammonia emissions proposed in the plan are perceived as important mechanisms towards the achievement of national and international obligations.</p>
Water (Surface Water, groundwater and Drinking Water)	<p>Ireland's national legislation and regulations in relation to water are derived from the following:</p> <ul style="list-style-type: none"> EU Water Framework Directive 2000/60/EC The Groundwater Directive 2006/118/EC Nitrates Directive 91/676/EEC (EC, 1991) 	<p>Pollution of waters from both diffuse and point sources arising from agriculture continue to be problematic. Inappropriate application of organic and inorganic fertilisers are associated with high nitrate levels in some groundwaters. There is a deficit in uptake of best technologies to prevent nutrient runoff from land and</p>	<p>Unregulated increases in livestock numbers and fertiliser application are deemed to present a threat to water quality in the absence of <i>Food Wise 2025</i>.</p>

Environmental Characteristic	Overview	Existing Problems	Evolution in the absence of Plan
	<ul style="list-style-type: none"> ▪ The European Communities (Drinking Water) Regulations 2007 (S.I. No. 106 of 2007). ▪ European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010). ▪ The European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2009 and 2010, ▪ The Nitrates Action Plans and the Code of Good Agricultural Practice. <p>Monitoring and enforcement of water regulations is undertaken by the EPA and the DECLG through local authorities.</p> <p>While the EPA (2012) notes that Irish water quality is good in comparison to other European countries it is noted that Ireland faces challenges in meeting the minimum standards set under the EU Water Framework Directive.</p> <p>Agricultural practices and farming activities impact significantly on water quality. Significantly, the EPA suspects that approximately 50% of pollution incidents are attributable to agricultural activity. The maintenance of good water quality, particularly in ground waters used for water abstraction for human consumption, is particularly important.</p>	<p>improved knowledge transfer programmes are required. While there is a decreasing trend in serious pollution incidents arising from agriculture, nonetheless such incidents still occur.</p>	<p>Improved knowledge transfer which is deemed to be essential to the preservation and improvement of water quality might not occur in the absence of the plan.</p> <p>Improved monitoring measures proposed under the Plan, particularly in areas where livestock numbers show an increasing trend, will serve as key indicators in directing appropriate policy and mitigation.</p>

Environmental Characteristic	Overview	Existing Problems	Evolution in the absence of Plan
Soils and Geology	Bedrock geology dictates the nature of soils. Soils provide the raw material and growing medium for all agricultural production. There is currently no EU Directive covering soils. Regulation of soils falls under Cross Compliance under the basic-payment scheme of the Common Agricultural Policy. Teagasc has recently published an updated soils map which gives details of both top soils and the underlying bedrock.	Soil quality in Ireland is generally regarded as good. Soil compaction and soil erosion, while not widespread, are regarded as problematic in some tillage areas. Erosion of peatland as the result of overgrazing was a problem but has been substantially addressed through commonage management plans.	Soil erosion in intensive tillage areas in the absence of improved technology proposed under the plan might occur. Conversion of peatlands to new forestry which might occur in the absence of the Forest Programme which is continued parallel to <i>Food Wise 2025</i> .
Landscape	The Irish landscape is a cumulative product of past farming practices and is heavily influenced by current practices. Landscape is controlled under the Planning and Development Acts 2000-2011. Landscape is also protected under the EIA Directive 2011/92 EU. The removal of hedges from the landscape is regulated above certain thresholds (exemptions apply in certain cases where removed hedges are replaced by an equivalent length of hedge under the basic payment system).	Increased intensification and the adoption of modern farming practices are perceived as a threat to landscape. Enlargement of fields, where permitted, may contribute to the removal of the traditional patchwork landscape.	In the absence of the Plan unregulated intensification or expansion of tillage or livestock numbers might result in the removal of landscape character.
Materials Assets	Material assets of relevance to the Plan such as farm buildings and associated infrastructure are controlled under the Planning and Development Acts 2000-2011. The range and type of farm building has evolved over time and currently keeps pace on a phased basis with changes in technology and requirements for automation.	There are pressures on the aggregate area of agricultural land available as a result of demand for housing, commercial development and infrastructure. As a consequence there is an annual reduction in the area available for agricultural use.	In the absence of the Plan there might be a greater imbalance spatially in the development and intensification of the various sectors. The Plan commits all industrial development associated with the agri-food sector to adherence with sustainability principals.
Cultural Heritage (including Archeology)	Cultural heritage encompasses archaeological and architectural heritage. Many archaeological	The accidental destruction of hidden features as the result of land cultivation may arise.	The absence of additional protections for monuments proposed under the Plan, in the

Environmental Characteristic	Overview	Existing Problems	Evolution in the absence of Plan
	features are located within working farms. Archaeological monuments are protected under the National Monuments Acts (1930-2004) and are protected under regulation.	Procedures for the protection of known monuments and their curtilage may lack robustness.	form of knowledge transfer and encouragement of minimum tillage, may result in increased damage to monuments.

3 Data Gaps

The SEA Environmental Report identifies data gaps as outlined in Table C. It should be noted that *Food Wise 2025* contains no quantitative targets for expansion at primary production level. In this regard there are no targets for increased areas under crop, no targets for changes in cropping mix or land use patterns and no targets for increased livestock numbers. *Food Wise 2025* foresees the possibility of a 65% increase in output at primary production level. This output is to be achieved by a combination of increased use of best available technology facilitated through knowledge transfer programmes, a higher value product mix aimed at a sophisticated consumer pool, and where sustainably possible potential increases in livestock numbers. *Food Wise 2025* envisages that increased value of primary production will be achieved by means of better use of technology and improved husbandry practices (through animal breeding, soil fertility and grassland management). *Food Wise 2025* further envisages that this increased value of primary production target will be achieved while reducing emissions to air, water and soil.

In the absence of quantitative targets it is not possible to predict whether livestock numbers will increase or decrease or in which sectors such an increase or decrease may occur. In these circumstances it is not possible to make quantitative predictions in relation to GHGs and ammonia emissions to air or nutrient emissions to water.

Table C Summary of Data Gaps

Environmental Characteristic	Data Gap
Population and Human Health	<ul style="list-style-type: none"> Specific Irish data linking environmental pollutants with health impacts and people. Specific Irish data linking impact of pesticides on human health
Biodiversity, Flora and Fauna	<ul style="list-style-type: none"> National habitat map Implications of production changes at regional and local level
Air Quality and Climate Change	<ul style="list-style-type: none"> National character of existing monitoring and reporting Ammonia deposition monitoring
Water (Surface Water, groundwater and Drinking Water)	<ul style="list-style-type: none"> Data based on first Water Framework Directive reporting period
Soils and Geology	<ul style="list-style-type: none"> Lack of soil mapping with regard to productivity, organic matter and soil compaction
Landscape	<ul style="list-style-type: none"> Lack of landscape character mapping
Materials Assets	<ul style="list-style-type: none"> Lack of readily available data on capacity of water, energy and waste management
Cultural Heritage (including Archeology)	<ul style="list-style-type: none"> Ongoing nature of production of records and inevitability that monuments have not yet being discovered

4 Strategic Environmental Objectives, Targets and Indicators

Having made the decision that *Food Wise 2025* should be subject to SEA the analysis team initially reviewed all the background papers and initial plan formulation papers prepared by the strategy committee. It was determined that as all elements of the proposed strategy could impact the environment the entire strategy would be the subject of SEA. Through an analysis of the baseline information across the environmental media (biodiversity, flora and fauna; air quality and climate change; water (surface water, groundwaters and drinking water); soil and geology; landscape; material assets; and cultural heritage (including archelogy)) a series of environmental issues were identified.

Through later refinement these were developed into Strategic Environmental Objectives (SEOs). These SEOs, summarised in Table D, were used to assess the strategy and reasonable alternatives leading to the identification of the most environmentally beneficial and contribution to the development of mitigation and monitoring measures.

Table D - Strategic Environmental Objectives & Targets

Strategic Environmental Objective	SEO Target
Protect, and reduce risks to, human health.	This Strategic Environmental Objective (SEO) entails ensuring that plan strategies do not impact negatively on human health
Avoid impacts on designated habitats or species	To ensure compliance with the Habitats Directive with regard to the protection of Natura 2000 Sites, Annexed habitats and species; To ensure protection of bird species listed under the Birds Directive;
Maintain and improve general biodiversity (including pollinators)	To ensure compliance with Article 10 of the Habitats Directive with regard to the management of other environmental features – which by virtue of their linear and continuous structure or their function act as stepping stones – which are of major importance for wild fauna and flora and essential for the migration, dispersal and genetic exchange of wild species.
Maintain and improve air quality	Reduce/Minimise emissions of atmospheric pollutants from each sector, with particular regard to ammonia arising from agriculture Minimise nuisance of odour or noise from activities
Control and Reduce GHG Emissions	To meet the requirements for GHG emissions from relevant sectors defined in the National Mitigation plan (once finalised)
Maintain and Improve the Quality of Surface and Ground Waters	To ensure that water bodies attain good water status or maintain excellent water status as required under the Water Framework Directive.
Do not increase flood risk or reduce resilience to climate change impacts	To ensure land use changes do not result in increased flood risk.
Protect, maintain and improve soil quality, quantity and function by promoting sustainable agricultural practices	To ensure land use changes or intensification of activity does not negatively impact on soil quality

Strategic Environmental Objective	SEO Target
To minimise the effects upon the sustainable use of land, mineral resources or soils	To ensure the maximum yield from natural resources without resulting in irreparable damage.
Protect cultural landscape features	Protect archaeological and architectural features on farmland, in forests and on coasts
Minimise impacts on broader landscape features (protect, enhance and manage the distinct identity, diverse character and special qualities of Irish landscapes)	Protect, enhance and manage seascape and coastal area landscapes Protect and enhance landscape value in designated areas Protect and enhance general landscape diversity

Alternative Strategies

In accordance with SEA Directive (EC/2001) alternatives to the proposed strategy were considered.

In summary the alternatives assessed are:

- **Base Case Scenario** is considered to be the best proxy for a business as usual or a do nothing scenario. This scenario is representative of what would happen in the absence of a new plan. This would involve the continuation of the moderate increases in output seen over recent years, mainly achieved through improvements in technology and management techniques.
- **Base Case + Scenario** would be achieved if the anticipated expansion in dairy cow numbers planned by farmers and the processing industry can be leveraged by substantial increases in the use of best technology facilitated by enhanced knowledge transfer programmes. This might see milk processor ambitions for increased output at primary production level being achieved through increases in dairy cow numbers and improved technology.
- **Sustainable Growth Scenario:** In order to mitigate potential environmental impacts arising from increased output and production associated with the *Base Case +*, there is a recognition that environmental protection and sustainability will need to be central to any increases in production.

5 Assessment of Alternative Strategies

Each of the alternative plan proposals was assessed to determine the potential of these plans at a strategic level to impact on the strategic environmental objectives. This assessment informs the decision making process in terms of identifying the most appropriate plan to bring forward and develop in detail. In summary *Food Wise 2025* has been developed after considering a number of alternative scenarios.

The *Base Case* scenario is considered to be the best proxy for a business as usual or a do nothing scenario and entails would happen in the absence of a new plan. This would involve the continuation of the moderate increases in output seen over recent years, mainly achieved through improvements in technology and management techniques.

The adoption of the *Base Case* could result in the following:

- Increased risk of nutrient discharge to water;
- Potential risks to designated ecological sites as agricultural, forestry and seafood production expands;
- Increases in ammonia and GHG emissions;
- Less sustainable agricultural output; and
- Potential for changes in landscape character arising from land use changes to facilitate increased production.

It is considered that this scenario has potential for less sustainable agricultural, forestry and sea food sectors and in the absence of effective management and monitoring of discharges/emissions and disturbance arising from these sectors, there would be an overall moderate negative impact.

The *Base Case +* scenario represented more ambitious levels of expansion than recent historical trends. In the case of the dairy sector it might be achieved by expansion in dairy cow numbers leveraged by substantial increases in the use of best technology facilitated by enhanced knowledge transfer programmes. This scenario could have significant economic benefits in terms of increased agricultural and processing outputs which would benefit the rural economy. However in the absence of improved sustainable production and processing, this alternative has the potential to have a moderate negative effect on the receiving environment.

The adoption of the *Base Case +* could result in the following:

- Increased risk of nutrient discharge to water;
- Potential risks to designated ecological sites as agricultural, forestry and seafood production expands;
- Increases in GHG emissions;
- Less sustainable agricultural output; and
- Potential for changes in landscape character arising from land use changes to facilitate increased production.

5.1 Sustainable Growth Scenario

The *Sustainable Growth* scenario differs from the other potential scenarios in the recognition of the necessity for the agri-food and marine sector to contribute and help fulfil both national and international obligations across all relevant environmental parameters. The choice of this strategy in favour of the other alternatives imposes responsibilities on the agri-food and marine industry to develop appropriate and effective mitigation strategies to ensure that any increases in primary production can only occur having full regard to Ireland's national and international obligations specifically in relation to: the maintenance and improvement of biodiversity; the maintenance and improvement of water quality status; and the improvement of air quality including a reduction in GHG and ammonia emissions.

The *Sustainable Growth* scenario focusses on the need for targeted research, the roll-out of mitigation and increased monitoring to verify and substantiate the role of the agri-food industry within the environment. Knowledge transfer, the further roll-out of the Origin Green programme and other initiatives aimed at reducing the carbon footprint of the agri-food industry are promoted.

6 Identification of Likely Significant Effects

As previously noted, Directive 2001/42/EC requires that the plan/programme in preparation and undergoing SEA should be assessed in respect of its potential effects on a range of environmental components, namely human beings (population and health); biodiversity, flora and fauna; water; air quality and climatic factors (here grouped together); soils and geology; landscape; cultural heritage (including archaeological and architectural heritage); and material assets.¹

Therefore possible expected impacts are described in general terms under each of the following SEA category headings, followed by thematic summaries of what is understood of the strategy proposals to date. This section outlines a summary of the assessment outcomes under the principle environmental headings considered as part of the strategic environmental assessment.

6.1 Population and Human Health

The Strategy, taken in conjunction with the previous Rural Development Programme, is seen as having broadly positive socio-economic effects for the rural community. Many of the strategy's actions will have a neutral or imperceptible effect while actions associated with Origin Green and focused research are deemed to have potential slight positive effects. A moderate positive effect is associated with actions for the development of human capital. A significant positive effect is identified in relation to food safety initiatives.

6.2 Biodiversity, Flora and Fauna

There are no specific growth targets for primary production within the strategy. Nonetheless growth opportunities and innovation, as a result of their uncertainty, are deemed to represent a slight negative effect on biodiversity. Broadly all other actions within *Food Wise 2025* are predicted to have an imperceptible or slightly positive effect on biodiversity. Further developments of the Origin Green programme will deliver moderately positive effects.

At a sectoral level proposed actions by DAFM are predicted to have a significant positive effect. At a sectoral level actions to increase soil fertility and actions which may result in unspecified increases in production levels are unpredictable and therefore deemed slightly negative. All increases in soil fertility are assumed to occur within the parameters of the Phosphorus Regulations, the Nitrates Directive, GAEC and SMRs.

6.3 Air Quality and Climate Change

In so far as *Food Wise 2025* commits the agri-food industry to the prior development of new mitigation where increased levels of production are envisaged and to playing its full part in achieving Ireland's current and future obligations in relation to GHG and ammonia emissions the plan as developed will have a slightly positive effect on air quality. Actions under Origin Green are predicted to have a moderately positive effect. Some actions are deemed to have a neutral or imperceptible effect while

¹ Directive 2014/52/EU, which becomes legally binding in 2017 before the realisation of Food Wise 2025, realigns the EIA environmental assessment categories in the same manner, thereby providing greater correspondence between SEA and EIA (EC, 2014).

uncertainties with regard to the nature of growth opportunities are deemed to represent a slightly negative effect.

Actions within *Food Wise 2025* in connection with policy development and recognition of agriculture's role in formulating energy policy have the potential to be significantly positive in relation to GHG emissions and moderately positive in relation to climate change. All other actions are deemed to moderately positive or imperceptible in relation to GHGs. As a result of uncertainty undefined growth opportunities are deemed to represent a slight negative threat.

At a sectoral level actions within the forestry sector are deemed to have a moderate positive effects. Uncertainties in relation to the consequences of some actions in relation to grassland management have been deemed to represent a slight negative threat.

While the greatest challenge to *Food Wise 2025* will undoubtedly be the question of GHG emissions, other emissions to atmosphere including ammonia, NO_x, PM, odour and noise require consideration, whether or not any substantial increase in the size of the national herd is proposed. Although a strong case can be made that Irish agriculture is the most carbon-efficient in the EU, the current regulatory framework seeks to limit agricultural GHG emissions.

6.4 Water (Surface, Groundwater and Drinking Water)

The Strategy must comply with the Water Framework Directive (2000/60/EC) and the Nitrates Directive (91/676/EEC) requirements. The WFD requires the implementation of measures as defined under the River Basin District Management Plans to prevent deterioration of the status of surface waters (i.e. streams, rivers, lakes, transitional and coastal water bodies) and groundwater - and to allow water quality to attain good water status. All public bodies are required to coordinate their policies and operations so as to maintain the good status of water bodies that are currently unpolluted and to improve polluted water bodies to good status in accordance with agreed Water Framework Directive cycle deadlines, i.e. 2015, 2021 and 2027.

Actions aimed at improving the environmental footprint of the agri-environmental sector will deliver significantly positive effects while other actions will deliver slightly positive effects. At a sectoral level uncertainties with regard to unspecified increases in growth and improvements in soil fertility and grassland management have been deemed to present a slightly negative threat.

6.5 Soils and Geology

Strategic actions within *Food Wise 2025* such as further roll out of Origin Green, environmental footprinting and innovation will deliver moderate positive effects for soil quality and geology. Other positive effects will flow from actions at a strategic level. Unspecified growth opportunities are deemed to represent a slight negative threat as a result of uncertainty.

At a sectoral level soil management actions will deliver significant positive effects. Other positive effects will flow from research and innovation.

6.6 Landscape

Food Wise 2025 envisages no changes in land use patterns save an increase in afforestation from 2021 to 2025. New afforestation is regulated so as to protect landscape character. Overall *Food Wise 2025* is found to have a positive or imperceptible effect on landscape. At a sectoral level some actions in forestry, aquaculture and cereal/tillage are deemed to have a slight negative effect as a result of uncertainties.

6.7 Material Assets

Material assets encompass man-made infrastructure, including transport-related (e.g. roads, canals), public services (e.g. wastewater treatment, water supply) and recreational facilities (e.g. picnic areas, walking routes, golf courses). Certain public services such as water and energy supply and waste management infrastructure are planned and permitted through specific processes that are informed by the existing and future needs identified within County Development Plans and Local Area Plans. Material assets also encompass natural assets with development potential such as aquaculture, wind energy or undeveloped lands, as well as financial attributes of current livelihoods (e.g. business or brand identity). The SEA takes into account the overall capacity of the water supply, energy supply, solid waste and wastewater services in meeting any additional significant demands imposed by the strategy.

6.8 Cultural Heritage (including Architectural and Archaeological Heritage)

Overall actions under *Food Wise 2025* are deemed to be either imperceptible or slightly positive. Actions in relation to growth opportunities are deemed to have a slight negative effect as a result of uncertainty.

6.9 Inter-Relationships

- Effects on human health and wellbeing can derive from Interactions with environmental factors such as water, soil or air through which contaminants or pollutants can come in contact with human beings.
- Positive actions to promote agri-tourism and improvements in the sustainability of the sector generally will have positive effects on population and human health.
- Water-dependant habitats and species (freshwater pearl mussel, shellfish waters and nutrient sensitive habitats in particular) can be affected by changes in water quality (e.g. contamination or eutrophication).
- Positive effects on habitats and species will come from improved soil management and reduced nutrient run-off (achieved through improved farm management practices or reduced stock numbers).
- Air pollutants such as NO_x contribute to acidification of soils and surface waters, which in turn can have effects on biodiversity, flora, fauna and human health.
- Agricultural landscapes are shaped by and, therefore, inter-relate with soil, water, climate and biodiversity, in addition to population and socio-economic factors (e.g. investment, market

demand, etc.). The opposite is also true, whereby landscape attributes (e.g. topography, slope) shape agricultural practices.

- Soils play a key role in drainage, filtration and flood protection and, as such, can contain the spread and buffer the effect of contaminants in surface and groundwaters.
- The emission of ammonia are a secondary precursor for the formation of particulate matter (PM_{2.5}) which has health implications for exposed populations.

According to EPA (2012b) there is a danger that critical loads of nitrogen may be exceeded in Natura 2000 sites as a result of ammonia depositions from air. Such increases in nitrogen loading on ecosystems are known to result in a decrease in species diversity and changes in species composition in favour of nitrogen loving species.

- Changes in climate could result in a variation in rainfall, which would have an effect on other environmental aspects such as biodiversity and water flows. In the context of the agricultural sector, climate change predictions must be given due consideration when managing the lands (e.g. as locally wetter climate may lead to greater pesticide use). Moreover, climate change may have significant effects on aquaculture as a result of increases in water temperature, and deterioration in the storm-free operational window for wild fisheries.

6.10 Cumulative Effects

Food Wise 2025 is a high level strategy to guide the agri-food industry towards 2025 under the guiding principal of sustainability. This high level strategy has been prepared in the knowledge of and with the aim of being in compliance with the objectives of all other plans and programmes currently in force and impacting on the agri-food industry.

Food Wise 2025 could generate cumulative effects in combination with other plans and programmes. For this reason this report has examined a number of other plans and programmes for their potential to interact with *Food Wise 2025* and generate significant cumulative environmental effects. A list of plans and programmes considered is outlined in Table E below.

Table E - Plans/Programmes Considered for Cumulative Effects

Plans/Programmes Considered
<ul style="list-style-type: none"> ▪ River Basin Management Plans ▪ EU Biodiversity Plan to 2020 (EC 2011) ▪ The National Biodiversity Plan ▪ European Union's Effort Sharing Decision (Decision 406/2009/EC2) ▪ UNFCCC Kyoto Protocol ▪ European Union's Decision 529/2013/EU (LULUCF) ▪ National Emissions Ceilings Directive(2001/81/EC)

6.10.1 Water Framework Directive & River Basin Management Plans

The Water Framework Directive (2000/60/EC) requires the attainment and maintenance of good status for Ireland's waters. Under the Water Framework Directive, River Basin Management Plans (RBMP) and Programmes of Measures were published in 2009 for the River Basin Districts identified for Ireland. The EPA is responsible for reporting on the status of water within each River Basin District. The individual RBMPs, on the basis of results of surveys, sampling and analyses specify Programmes of Measures necessary in order to safeguard water quality and meet objectives under the Water

Framework Directive. Preparation for the second cycle (2016-2021) of river basin management planning is currently underway and the Programmes of Measures arising from the new RBMPs have the potential to impact on current and future agricultural practices.

In so far as *Food Wise 2025* will contribute to changes in agricultural practice which have been identified to have a direct link to diffuse and point source pollution of surface water, groundwater, drinking water and estuarine water quality the probability of cumulative effects with the Water Framework Directive and RBMPs arises. *Food Wise 2025*, focusing as it does on sustainability and calling for increased research and actions to limit nutrient enrichment of watercourses from agricultural practices, should help achieve the objectives of the Water Framework Directive. The further investment proposed in monitoring, particularly in relation to areas of high dairy concentration, will act as an early warning system and will help to develop policies and measures aimed at protecting water quality.

6.10.2 EU Biodiversity Plan to 2020 & National Biodiversity Plan

In 2011 the EU adopted the EU Biodiversity Plan to 2020 (EC 2011) to halt the loss of biodiversity and improve the state of Europe's species, habitats, ecosystems, and the services they provide for the period to 2020. The National Biodiversity Plan (DAHG, 2011a) defines its vision as "the biodiversity and ecosystems in Ireland are conserved and restored delivering benefits essential for all sectors of society". In addition the National Biodiversity Plan calls for progress to be made towards substantial recovery in biodiversity by 2020.

Food Wise 2025 embracing as it does the concept of sustainability would be anticipated to have positive impacts on biodiversity. In particular objectives in *Food Wise 2025* concerning targeted research and knowledge transfer should aid the achievement of the following National Biodiversity Plan objectives:

- To mainstream biodiversity in the decision making process across all sectors
- To substantially strengthen the knowledge base for conservation, management and sustainable use of biodiversity
- To increase awareness and appreciation of biodiversity and ecosystems services
- To conserve and restore biodiversity and ecosystem services in the wider countryside
- To conserve and restore biodiversity and ecosystem services in the marine environment
- To expand and improve on the management of protected areas and legally protected species
- To substantially strengthen the effectiveness of international governance for biodiversity and ecosystem services

Initiatives under Pillar I of CAP will help promote biodiversity on tillage farms. Initiatives under the Green Low-Carbon Agri-Environment Scheme (GLAS) will further underpin biodiversity objectives.

6.10.3 GHG Commitments

As of 2013 the European Union's Effort Sharing Decision (Decision 406/2009/EC2) sets 2020 targets for non-ETS sector emissions and annual binding limits for the period 2013-2020. Ireland's target is to reduce non-ETS emissions by 20% by 2020 compared with 2005 levels.

Ireland's 2013 GHG emissions for non-ETS sectors are 42.61 Mt CO₂ eq (EPA 2015a). This value is the national total emissions less emissions covered by the EU's emissions trading scheme for stationary and aviation operators. Agriculture accounted for 49% of total non-ETS emissions in 2013 and both showed an increase in emissions in 2013.

Ireland's annual target for 2013 is 46.892 Mt CO₂ eq. This indicates that Ireland will be in compliance with its 2013 Effort Sharing annual limit. Final compliance for 2013 will be determined following submission of official data in January 2015 and review of this data by the European Commission. The compliance transactions will subsequently be carried out on the Registry in late 2015.

In relation to international commitments, 2013 is also the first year of the second commitment period (CP2) under the UNFCCC Kyoto Protocol, the Doha Amendment 3. The EU and its Member States along with Iceland have decided to jointly fulfil its commitments (QELRC) under the Doha Amendment as allowed by Article 4 of the Kyoto Protocol. Ireland's compliance with the Doha Amendment will be assessed at the end of the commitment period based on the GHG inventory submission in 2022 for 1990-2020 data.

Agriculture's role in relation to air pollution must also take consonance of the EU Clear Air Policy, the CAFE Directive and the National Exposure Reduction Target for PM_{2.5}.

Under the United Nations Framework for Climate Change, and under the Kyoto Protocol Ireland has a legal obligation to report carbon stock change in forests, and for the following activities: afforestation, reforestation and deforestation, and forest management. All forest carbon pools; above ground biomass; below ground biomass; soil carbon; litter; deadwood and harvested wood products must be included. In addition Ireland is required to report these stock changes and pools to the EU under Decision 529/2013.

In so far as *Food Wise 2025* promotes the concept of sustainability and promotes research directed at limiting GHG emissions the strategy will have positive impacts. In this regard, sustainable expansion of the forestry sector with consequent reduction of fossil fuel reliance will also have a positive impact. Increases in production arising from an expansion in livestock numbers will have a negative implication for GHG emissions.

6.10.4 National Emissions Ceilings Directive

Directive 2001/81/EC on National Emission Ceilings for certain pollutants (NEC Directive) sets upper limits for each Member State for the total emissions in 2010 of the four pollutants responsible for acidification, eutrophication and ground-level ozone pollution (sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia), but leaves it largely to the Member States to decide which measures – on top of Community legislation for specific source categories - to take in order to comply.

The National Emission Ceilings Directive 2001/81/EC (NECD) is currently being reviewed as part of The Clean Air Policy Package. The proposal repeals and replaces the current Union regime on the annual capping of national emissions of air pollutants, as defined in Directive 2001/81/EC. By doing so, it ensures that the national emission ceilings (NECs) set in the current Directive 2001/81/EC for 2010

onwards for SO₂, NO_x, NMVOC and NH₃ shall apply until 2020 and establishes new national emission reduction commitments ("reduction commitments") applicable from 2020 and 2030 for SO₂, NO_x, NMVOC, NH₃, fine particulate matter (PM_{2.5}) and methane (CH₄).

Ireland is facing increasing pressure to meet existing compliance levels in relation to ammonia. Current proposals under discussion point towards increased targets and further reductions in the period beyond 2020 with interim targets to be met by 2025. While *Food Wise 2025* targets an increase in the value of primary production of 65% it does not specify any increases in livestock numbers which would contribute to increased emissions. In this context the adoption of mitigation measures such as trailing shoe organic fertiliser application is important alongside development of further mitigation measures.

6.11 Transboundary Effects

The Irish agri-food industry comprises the: agriculture; food and beverage; fishery; fish processing; forestry; and forestry processing sectors. The *Agri-Food 2025 Strategy* is required to provide an overarching plan for these sectors across Ireland and in Irish estuarine and coastal waters. As a result, the measures outlined in the strategy have potential to impact on the receiving environment of the entire territory of Ireland. In addition, it is also considered that there is potential significant impacts on Northern Ireland. This is principally due to the land border shared with Northern Ireland.

It is considered that there is potential for impacts on border areas arising from *Food Wise 2025* in line with those outlined in Annex I SEA Assessment Matrix. However there is increased potential for impacts on water resources in Northern Ireland arising from elements of the plan, due to the fact that there a number of catchments which have connectivity across the border. However, as no negative effects are predicted for water quality no transboundary effects are anticipated.

It is considered that the most significant transboundary effect could result from potential increases arising from GHG emissions and ammonia. *Food Wise 2025* suggests measures for limiting GHG emissions and ammonia. Therefore no consequent transboundary effect is predicted as a result *Food Wise 2025*.

7 Mitigation Measures

SEA requires devising mitigation measures to avoid, reduce, remedy or offset the potential for significant adverse effects as identified in Section 6. Mitigation measures are commonly directly linked to potential impacts. They entail amending those draft objectives and targets that may result in significant adverse effects on the environment, or incorporating new objectives and targets to ensure such effects are addressed and mitigated. Tables F to Q summarise the proposed mitigation measures that will be implemented to ensure that *Food Wise 2020* will not have a significant effect on the receiving environment.

Table F General Mitigation Measures

Actions / Section		Comments	Mitigation / Monitor
Chapter 4: Sustainability	1. Recognising Agriculture's role in ongoing National, EU and International Climate Change and Energy Policy Development.	<p>Actions have a strong focus on agriculture's role in climate change. Positive effects on climate change mitigation and adaptation, with knock-on benefits for air quality. There may also be indirect benefits for the environment. However, the pressure to increase rates of afforestation could have potential adverse impacts depending on the location of such changes in land use. Therefore, overall environment effects as assessed as neutral.</p> <p>Bioenergy and use of animal by-products for energy production will help reduce waste and maximise re-use and efficient use of resources.</p>	<p>Ensure adaptation and resilience of the agriculture industry to future climate effects is considered.</p> <p>Ensure that mitigation measures are developed for the sectors covered by the plan based on the requirements of the National Mitigation Plan, once developed.</p>
	2. Measurement of Ireland's environmental sustainability credentials	These measures aim to gauge progress against criteria and this would be regarded to be an essential element of ensuring that the schemes referred to are actually delivering their goals. There will be a positive effect on the environment as measuring and reporting on sustainability indicators will help identify problem areas and actions can be taken to address the issue. Roll out of the Carbon Navigator Initiative will help farmers understand how their farms produce GHG emissions and these may be reduced.	<p>A key element of ensuring that Irish agriculture is sustainable is the generation of metrics to measure the environmental and sustainable performance of agricultural production. (These metrics can also be used to promote Irish agriculture.)</p> <p>This can be done by ensuring that the monitoring requirements outlined in the Environmental Report are followed on and reported.</p> <p>This should include additional research analysis of the potential sustainable production output levels associated with the <i>Sustainable Growth Scenario</i> proposed by <i>Food Wise 2025</i>.</p>
	3. Further Development and Enhancement of Origin Green Programme	Development and Enhancement of the Origin Green programme will have positive effects for the environment. In particular, soil health, nutrient management, biodiversity, animal health and welfare, efficiencies in energy usage, waste water, food waste, and packaging waste. Knowledge transfer, funding, and engagement will help promote sustainable agricultural practices and awareness of environmental issues and benefits of the Origin Green programme.	Origin Green is required to be implemented on the ground at primary producer level and processing facility level to ensure that a minimum level of environmental performance is attained by all producers.

Actions / Section	Comments	Mitigation / Monitor
4. Improvement of Environmental footprint of Sector	<p>The recommendations will have positive environmental effects. In particular, actions on the delivery of the Water Framework Directive and Nutrient Management software tool will have positive effects on water quality and associated benefits for biodiversity. Actions on nutrient management, efficient use of nutrients, specific soil advice, nutrient census, and the PastureBase Ireland tool will help improve soil fertility and reduce effects associated with fertiliser use. Actions to address declining fish stocks will help maintain the sustainability of the fisheries industry.</p> <p>Positive linkages to the Conservation Objectives of European Sites can be seen in reference to maintaining populations and ranges (e.g. by maintaining fish stocks which may be prey items for seabird, cetacean, seal and otter populations). Commitments made to monitoring the effects of local changes in dairy practice are useful contributions to the range of monitoring commitments for this sector and will have to be combined with appropriate feedback response mechanisms to address scenarios whereby the results suggest adverse effects. Sector-specific actions are regarded to provide potential positive impacts on European site integrity as they address threats such as eutrophication, overfishing and ground/surface water pollution by hazardous waste.</p>	Where additional biodiversity pressures are identified, develop specific additional mitigation measures to preserve and sustain.
5. Develop and support Agri-food processing sector in delivering sustainable processes and outputs	Positive effects on GHG emissions and air quality from uptake of renewable energy technologies, energy efficiency actions and promotion of biomass. Actions for uptake of environmental protection systems and increasing environmental awareness at SME level will result in positive effects for the wider environment	Origin Green is required to be implemented on the ground at processing facility level to ensure that a minimum level of environmental performance is attained by all producers.
6. Implementation of Environmental Elements of Ireland's National Programmes and the EU co-funded Rural Development Programme 2014-2020	The actions will have positive effects on the environment as they aim to ensure compliance with the WFD, habitat preservation, carbon capture through afforestation, raise awareness of and mitigate GHG emissions, and promote uptake of grants for low emission slurry spreading equipment and farm nutrient storage.	
7. Prioritise Research Funding on Sustainability of Irish Food production	The action sets out key research areas and evidence gathering including vulnerability of food production systems to climate change, technologies to reduce effects of food production on water quality, identifies positive measure for biodiversity, develops technologies for reducing ammonia and GHG emissions, assess carbon sequestration,	

Actions / Section		Comments	Mitigation / Monitor
		supports the health and nutrition benefits of grass based food production. This will have a number of benefits for the environment by providing evidence for the existence or otherwise of linkages between agricultural activities and environmental impacts and solutions for where there may be adverse impacts occurring.	
	8. Implementation of 2025 strategy actions in context of sustainability	Monitoring of implementation at a local level will help in providing evidence for the existence or otherwise of linkages between agricultural activities and environmental impacts and solutions for where there may be adverse impacts occurring.	
Chapter 5: Growth Opportunities	Growth opportunities	There are no specific actions or growth targets for primary production within the chapter. However, the chapter does set out growth opportunities include sectoral expansion within the dairy sector, meat sector, seafood sector, and whiskey and craft beer sector. Sectoral expansion has potential for negative effects on water quality, biodiversity, soil quality, GHG emissions, waste generation, and landscape through intensification, change in land use, use of fertilisers, and increase in animal numbers. The strategy also recognises that consumer trends for natural, organic foods are growing and there is potential for new market opportunities. It is unclear whether this would involve land use and intensification changes or whether it would replace some existing areas and sectors.	When taken just as sectoral expansion the strategy will have negative effects. However, if this is combined with the actions in Chapter 4 then environmental effects should be reduced. Undertake water monitoring in areas subject to increasing livestock densities.
Chapter 6: Delivering Growth	Human capital	Increased knowledge and awareness of legal requirements, ecological impacts and mitigation measures will contribute to better agri-food practices across the sector. Better education, skills, and knowledge exchange will contribute to the sustainability of the agricultural sector and promote sharing of best practice framing methods and environmental innovation. The actions on health and safety and animal health will help reduce human health risks associated with the industry.	
	Competitiveness	Actions to improve the transport efficiency of supply chains and the need to develop infrastructure will have positive effects for sustainable development. Actions will contribute toward better use of land, soil management and retention of nutrients in the soil, limiting the amount of nitrogen and phosphorous to surface and groundwaters. The action to promote agri-tourism will have positive effects for tourism in Ireland.	
	Market Development	The actions are focussed on market positioning and building reputation and trade with emerging markets. It is unlikely that this will have environmental effects.	

Actions / Section		Comments	Mitigation / Monitor
		However, if it leads to increased production and change of land use the negative effects may emerge. The action on increasing linkages with Tourism Ireland and new markets is likely to have positive effect for agri-tourism. .	
	Promoting “Ireland” in new markets	Positive effects for agri-tourism as the actions promote ‘Ireland’ develop marketing material, and better link food and tourism. In isolation, this proposal could increase pressure on sites along the Wild Atlantic Way (WAW) and other food trails. The WAW has undergone its own AA process and mitigation measures therein would have to be taken into account at the project-scale.	
	Origin Green	The actions will further promote entry to the Origin Green scheme which will provide overall positive impacts to the environment..	
	Animal Health Status	The actions are focussed on animal health. This will have positive effects on human health risk, waste, and sustainable agriculture as helping eradicate livestock disease will reduce mortality rates and the number of animals that have to be culled.	
	High food Safety status	The action is to improve monitoring and predictive capacity to response more timely to food safety threats. This will have positive effects for human health risks but is unlikely to effect the wider environment.	
	Innovation	Proposals that aim to increase productivity coupled with research into how to do this whilst ensuring soil fertility will addresses nutrient retention to provide a positive impact on soil quality. Creating an internationally recognised research hub and knowledge centre will attract visitors from around the world, resulting in sportive effects on agri-tourism. Actions relating to the expansion of the sector to marine species of fish, shellfish and seaweed as possible new products could have adverse effects on the European sites through loss of feeding resources for birds and Annex II species, damage and deterioration of offshore and coastal habitats.	Research should also include environmental sustainability practices and innovations. Monitor effects of seafood production on European designated sites. Continued EIA screening on aquaculture licence applications.

Table G Dairy Sector Mitigation Measures

Priority/Action		Comments	Mitigation / Monitoring
Driving Farm Competitiveness	Knowledge, Skills and Extension	Participation in Knowledge Exchange Groups could indirectly benefit the environment as dairy farmers will gain knowledge and skills to improve management of farming activities to protect the environment. Knowledge exchange programmes to upskill farmers will help support economic activities.	Promote the carbon navigator tool Knowledge exchange groups should advise on sustainable agricultural practices Actions to ensure transference of research findings to advisers and private consultants
	Breeding and Genetics	Although the actions will support economic activities through increased efficiencies and profitability there is no protection of the receiving environment mentioned. Dairy cows will be bred for greater milk yield while maintaining or reducing overall cow size, thereby decreasing feed intake and waste output which will have positive effects on agricultural waste reduction and associated water quality benefits. Offspring produced will be targeted for specific enterprises, reducing numbers of 'unwanted' offspring nationally. The proposed actions under dairy expansion do not necessarily imply an increase in the national herd but better genetic breeding. This has potential positive effects on GHG emissions. Increased volumes of milk processing could increase wastewater treatment capacity requirements	Include an action to promote genetics as a source of increased output from lower inputs
	Grassland and Soil Management	Increasing soil fertility is likely to involve use of fertilisers which can have negative effects for water quality, habitats, and species. Impacts on groundwater arising from increased leaching of nitrates. However, the strategy must comply with the WFD and Nitrates Directive so fertiliser use must be controlled to allow WFD targets of good water status to be achieved. Potential effects on habitats and species (aquatic and terrestrial) where intensification involves higher volumes of manure to be managed and increased use of fertilisers, herbicides and pesticides. Liming can release GHG emissions. Positive effect on improving grassland soil quality and maximising efficient use of grasslands	Define efficient use of grass e.g. in terms of grass utilisation per hectare at present and in the future Increased soil fertility should be based on accurate nutrient management planning and soil testing Include pH target Nutrient advice by Teagasc and others needs to be further refined to account for location-specific risk of nutrient losses, as well as GHG emissions Good water status for all water bodies is a requirement of the WFD, therefore, agricultural 'projects' under this strategy can only progress when it has been demonstrated that they will not result in a WFD target not being achieved.

Priority/Action		Comments	Mitigation / Monitoring
		Land use / landscape changes from intensification of grazing patterns and possible land rationalisation (although this is subject to control under existing agri-environmental measures)	
Managing Volatility through financial management and informed decision making		Although the actions will support economic activities there is no protection of the receiving environment mentioned. Providing stability in the dairy sector has potential benefits to the environment as it reduces the risk of land abandonment or rapid intensification.	None
Processing, adding value & marketing		Origin Green will promote sustainable agricultural development and depending on the environmental indicators should have benefits for species and habitats, water quality, GHGs and soil quality. Adding value and new product development will support economic activities and agri-tourism	State the verifiable sustainability credential to be monitored Require all production facilities to be certified under Origin Green scheme
Environment		The inclusion of environmental actions will help protect the environment from potentially harmful agricultural activities. However, the actions do not offer detail on how environmental challenges will be addressed and monitored or how future challenges such as climate change will be addressed. In the context of increased production by 2025 additional safeguards are required to address such increased pressure on the environment.	Specific environmental targets should be set for: <ul style="list-style-type: none"> the Rural development programme (RDP) and specifically the adoption of the agri-environment climate measures in the RDP; and the Green Low-Carbon Agri-environment Scheme (GLAS) Ensure all processing facilities are registered under Origin Green Farm developments in Natura 2000 sites should be assessed to ensure no significant impact on the qualifying criteria of the site Proper management of agricultural waste through land spreading can provide valuable nutrients DAMF commission further research on production methodologies to facilitate the development of the sustainability scenario Cost benefit analysis in relation to mitigation measures for ammonia emissions should be undertaken by DAFM

Table H Beef Sector Mitigation Measures

Priority Actions		Comments	Mitigation / Monitoring
Driving on-farm competitiveness	Breeding & Genomics	Positive effect on agricultural waste reduction and associated water quality benefits if it is assumed that there is improved feed conversion ratio thus requiring less feed intake to produce more meat, thereby decreasing feed intake and waste output. Maximisation of bovine potential will add to this. Although the actions will support economic activities through increased efficiencies and profitability there is no protection of the receiving environment mentioned.	Promote increase output from lower inputs, reduced age to slaughter, better feed conversion and smaller breeds.
	Farm management practices	The impact of focussing on kg/ha will impose pressure on either land availability for extra livestock or increasing stocking densities could put pressure on grass production. Either impact would be regarded to be negative for the environment, primarily by means of concerns that there would be increased nutrient runoff and increased demand for grass feed. However, positive impacts in the form of reduced nutrient runoff to surface waters through the increasing reliance on low emission slurry spreading and selection of grass species to allow increased overall grass output and utilisation per hectare whilst reducing requirement for fertiliser inputs. Therefore, overall neutral score for water quality, soil quality, and agricultural waste. Increase in livestock numbers has potential to increase GHG emissions. Increased animal numbers will also increase animal waste, ammonia, phosphors, and nitrates, and well as silage which can cause deterioration of water quality but can also provide nutrients to watercourses. Potential effects on habitats and species (aquatic and terrestrial) where intensification involves higher volumes of manure to be managed and increased use of fertilisers, herbicides and pesticides.	Define efficient use of grass e.g. in terms of grass utilisation per hectare at present and in the future Increased soil fertility should be based on accurate nutrient management planning and soil testing Include pH target Nutrient advice by Teagasc and others needs to be further refined to account for location-specific risk of nutrient losses, as well as GHG emissions Good water status for all water bodies is a requirement of the WFD, therefore, agricultural 'projects' under this strategy can only progress when it has been demonstrated that they will not result in a WFD target not being achieved.
	Animal health & welfare	Actions will help control spread of disease	None
	Education and knowledge transfer	Positive potential impact as it allows the sharing of knowledge and potentially the consequence that more farmers find more efficient ways of increasing productivity, reducing emissions and waste production	Promote the carbon navigator tool. Improved grass management techniques should also protect the receiving environment
Furthering our reputation on international markets		Actions are focussed in increasing reputation within international market which are unlikely to affect the environment. However, if this opens up new markets which require	Ensure all processing plants are registered under the Origin Green scheme

Priority Actions	Comments	Mitigation / Monitoring
	increased herd then negative effects could arise associated with land pressure, water contamination, and GHG emissions.	
Adding value through R&D	Actions focussed on research on animal health and disease control. Positive potential impact on European sites at a national-scale as such research, if correctly focussed, could look at increasing productivity independent of emissions and waste production and reviewing procedural systems for authorisations, land management and conservation that have adverse effects on the profit margin for this sector.	Research into effectiveness of environmental management practices under existing schemes and the generation of revised best practice guidance where required Research into the potential reduction in methane generation arising from cattle and roll-out appropriate mitigation
Environment & sustainability	The action focussed on lowering climate change impact at processing level. This will have positive effect on GHG reduction and knock-on effects for air quality and climate adaptation. At a national level it will contribute to achievement of emissions targets.	At a farm level there needs to be a strategy to ensure effective environmental management, monitoring and reporting Farm developments in Natura 2000 sites should be assessed to ensure no significant impact on the qualifying criteria of the site
Government Actions	Providing stability in the beef sector is likely to be of benefit to European sites as it reduced the risk of land abandonment or rapid intensification	Technical efficiency improvement should ensure that environmental targets are met in terms of EU commitments under the WFD and relating to GHG and ammonia emissions
Cross cutting actions	The actions are about financial packages and balancing labelling requirements with costs. There is unlikely to be any interaction with environmental receptors. The actions will support economic activities minimising and balancing impact of labelling on competitiveness of the export market	None

Table I Sheep Sector Mitigation Measures

Priority/Action	Comments	Mitigation / Monitoring
Farmer actions	The actions as stated have the potential to pose potential positive effects on the environment as the increased production of sheep meat is focused on getting more out of the existing flock rather than emphasising increasing stocking rates or expanding grazing areas.	Focus on managing overgrazing particularly in areas of ecological importance or in areas where water bodies are sensitive
Processing actions	Increased demand on the disposal of sheep carcasses after boning may have adverse effects for waste management capacity.	Ensure that food processing plants are registered under the Origin Green scheme
Department actions	Positive potential effect as it allows more efficient control over production and reducing waste production that could otherwise affect the environment	None
Other agency actions	The actions as stated have the potential to pose potential positive effects on the environment as research may allow more efficient control over production and reducing grazing pressure and deterioration of grassland biodiversity. Development of a Carbon Navigator Tool for sheep producers will give positive effects on GHG emissions.	Need for monitoring and recording of environmental impacts arising from this sector on a farm by farm basis

Table J Pigmeat Sector Mitigation Measures

Priority Actions	Comments	Mitigation / Monitoring
Farmer actions	Potentially positive effects through the implementation of proposed initiatives for increased co-operation with tillage farmers for the re-use of animal manure and from proposals to explore an anaerobic digestion for conversion of manure. Investment in energy efficient pig facilities will contribute to lower emissions from the sector	Ensure all licenced pig production units are compliant with their licence requirements
Processing actions	Positive potential effect as it allows more efficient control over production and reducing waste production that could otherwise affect the environment	Ensure that all processing facilities are registered under the Origin Green scheme
Department actions	Actions are focussed on bi-security and Pig Salmonella Control Programme which will have positive effects on reduction of risk to human health	Explore the GHG emissions and ammonia arising from pig production and opportunities to reduce GHG and ammonia emissions
Other agency actions	Carbon foot-printing will have positive effects for GHG emissions reduction. An upgraded pig research unit has the potential for positive effects on the environment if research looks at optimising practices, GHG emission associated with pig production, sustainable use of natural resources, and environmental effects of pig production	Undertake research into optimising practices, GHG emission associated with pig production, sustainable use of natural resources, and environmental effects of pig production

Table K Poultry Sector Mitigation Measures

Priority Actions	Comments	Mitigation / Monitoring
Farmer actions	Potentially positive impacts could result if the energy efficiency reduces the demand on natural resources and emissions. Improved bio-security and awareness will help reduce risk to human health.	Ensure effective implementation of nutrient management at poultry production facilities in terms of the management and re-use of waste Ensure intensive poultry units are in compliance with IPPC licence requirements
Processing actions	There is unlikely to be any interactions	Ensure that all farms are registered with the Origin Green scheme
Department actions	Actions to upgrade existing buildings have the potential for positive effects in terms of energy efficiency and GHG reduction, and re-use of existing infrastructure. Construction of new buildings would also see these benefits but development should be carefully sited to avoid environmental effects. Actions to address bio-security, disease outbreaks, and food scares will have significant positive effect for reduction of human health risks	Siting of new housing to avoid environmental effects
Other agency actions	Incorporation of sustainability criteria under the Origin Green programme into the PPQAS would have positive effects for the environment	Integration of the PPQAS scheme with Origin Green.

Table L Cereals/Tillage Sector Mitigation Measures

Priority Actions	Comments	Mitigation / Monitoring
Farmer actions	The strategy does not envisage an increased area under tillage. Tillage is carried out predominantly in land of the South and South East and to a large extent, outside European sites but some tillage areas provide supporting habitat for geese and other bird species that form qualifying interests for SPAs. The actions as stated have the potential to pose potential adverse impacts on the integrity of European sites if the changes in the type of crop would affect supporting roles played for European sites. Positive impacts are also possible when the actions regarding the re use of organic manure and other “greening initiatives” are considered. Change of land use and intensification of harvest patterns can also affect landscape. Cereal sector can also generate nutrient imbalances and soil contamination as a result of fertiliser application beyond soil assimilative capacities. This can also lead to water quality deterioration and eutrophication.	Improve the management of farms to manage environmental impact. This includes effective and sustainable use of manures and fertilisers to ensure GHG and ammonia emissions are controlled, in addition to nutrient losses to water and potential impacts on Natura 2000 sites Promote minimum tillage
Processor actions	These changes will occur within the existing tillage lands and will be reflected in an improved rotation and increased diversity of crops within individual farms as dictated by greening measures under CAP. Traditionally, tillage lands are located in the South and Eastern part of the country and lie predominately outside Natura sites. Effects on these sites are likely to be neutral unless the changes to land use remove the supporting role that some fields will play for some bird species also using SPAs. In such cases a potential adverse effect is possible. However, potential positive impacts are also possible when the actions above require the use of organic manure and other “green initiatives” are considered such as the use of catch crops etc. Change of land use and intensification of harvest patterns can also affect landscape. Cereal sector can also generate nutrient imbalances and soil contamination as a result of fertiliser application beyond soil assimilative capacities. This can also lead to water quality deterioration and eutrophication.	
Department actions	Positive potential effect as it allows more efficient crop production, reducing emissions and waste production that could otherwise affect the environment.	
Other agency actions	The action to roll out Origin Green programme to tillage producers will have a positive effects on the environment	
Cross cutting actions	The actions as stated have the potential to pose potential positive effects on the environment if there is greater stability in the tillage sector and greater use of break	

Priority Actions	Comments	Mitigation / Monitoring
	crops which allow soil fertility to recover naturally and may reduce the need for fertiliser use which would have knock-on benefits for water quality and biodiversity. However, there is the potential for adverse effects on the designated nature sites if the increased production of the seed potato crops is at the expense of high nature value land or other habitats that are part of or support European sites. Change of land use and intensification of harvest patterns can also affect landscape.	
Research & innovation actions	Positive potential effect as crops suited better to Irish tillage systems may require less fertiliser, pesticide and herbicide application which would result in benefits for water quality and associated habitats and species. Crop better suited to Irish tillage systems may also be better able to cope with climate effects in the region.	Introduce monitoring and recording of environmental management of farms to identify the performance of existing schemes in terms of controlling nutrient losses, GHG and ammonia emissions, and impact on Natura 2000 sites

Table M Horticulture Sector Mitigation Measures

Priority Actions	Comments	Mitigation / Monitoring
Farmer actions	<p>Potential for positive effects on the environment through increase crop production efficiency, thereby requiring less land and resources. Technologies to accurately map crop input requirements will have a positive effect as they should result in reduced wastage.</p> <p>Soil erosion in winter periods can be anticipated from the horticulture sectors, when the farmland is uncultivated or fallow. This will have different magnitudes depending on soil type (e.g. sandy soils being more vulnerable to erosion).</p>	Manage the environmental impacts of activity through the implementation of best practice considering all relevant guidance. This should ensure the implementation of nutrient management plans and managing potential impacts on important ecological habitats, particularly Natura 2000 sites
Processing actions	<p>The promotion of Origin Green amongst growers will have positive benefits as the scheme encourages farmers to set achievable goals while promoting sustainable farming practices.</p> <p>Potential for negative effects on surface water quality from increased use and subsequent run off of pesticides and Nitrogen, Potassium and Phosphorous fertilisers (could also affect biodiversity). However, use of Origin Green should mitigate effects by providing environmental targets to promote environmental protection.</p>	
Department actions	Supply chain inspection of country of origin labelling may have positive effects on human health risks. There is unlikely to be effects on the environment	
Other agency actions	<p>The actions on promotion of healthy eating and health benefits of fresh produce, and getting active by gardening will have a positive contribution to human health. Promotion of gardening will have benefits for landscape and ecology, and the wider environment.</p> <p>The roll out of the Origin Green programme will have positive effects on the sustainability credentials of the industry and associated environmental benefits.</p>	As part of the Origin Green programme undertake monitoring and reporting of the effectiveness of environmental management on a farm by farm level
Government actions	Actions are focussed on costs, funding, and contracts and are unlikely to have an effect on the environment	Ensure that agriculture is not impeding the country meeting environmental standards required under WFD and in terms of GHG emissions

Table N Prepared Consumer Foods (PCF) and Alcoholic Beverages Sector Mitigation Measures

Priority Actions	Comments	Mitigation / Monitoring
Producer actions	The action is to establish discussion groups for malting and barley growers. This is unlikely to affect the environment unless discussion groups share sustainable practices and raise environmental awareness.	Ensure environmental and sustainable practices discussion groups is included
Industry actions	<p>All companies are to sign up to Origin Green which will provide environmental protection and sustainability credential for the sector.</p> <p>It does not specifically state whether increasing expenditure on R&D and innovation and training includes environmental management and sustainable practices. However, if it does then there will be positive effects for the environment.</p> <p>Improving waste recycling levels will have positive effect in terms of using resources more efficiently and reducing waste material generated.</p> <p>The action to develop an Irish Whiskey and food paring trail as a major tourism attraction will have positive effects for the economy and tourism.</p>	R&D and innovation on sustainability practices and production efficiency
Departments & State Agencies	Although not explicitly stated, the actions are likely to lead to increased growth and production. Intensification of harvest patterns and monocultures are likely to affect the landscape. Intensification of harvest patterns may also have negative effects on biodiversity and water quality (and WFD targets) from use of fertilisers and pesticides. However, the action to use Origin Green is likely to contribute to environmental protection within the sector.	Ensure that environmental protection in terms of managing discharges to water, reducing emissions to air.

Table O Forestry Sector Mitigation Measures

Priority Actions	Comments	Mitigation / Monitoring
Expansion of the forest resource	<p>In the absence of any safeguards the impact of increased afforestation rates on the integrity of European sites and sensitive or valued landscapes could be both positive and negative depending on the location of the afforestation and associated forest roads, the habitat which it is replacing and the species being planted. These activities may result in an increased homogenisation of local landscapes. Negative effects on biodiversity might also be anticipated from the forestry sector since the primary emphasis is on non-native species - although it is noted that the Forestry Programme includes specific requirements to promote biodiversity in new afforestation.</p> <p>Negative effects on surface water quality might also be anticipated from forestry as a result of slurry/fertiliser run off, siltation, and acidification which affect WFD targets. Soil degradation (with regards to acidification, nutrient imbalance or soil biodiversity deterioration) can derive from activities from the forestry sector.</p> <p>Forest expansion would create more carbon sinks and have positive effects for air quality and climate change.</p>	<p>Ensuring that efficient management techniques are put in place to ensure protection of the receiving environment, particularly biodiversity, soil quality and water quality in line with WFD targets</p> <p>Consider development of bird Forest Sensitivity maps</p>
Management of the resource	<p>Providing a range of species types will benefit biodiversity and landscape and move away from monocultures.</p> <p>The introduction of a National Forest Management Planning System will provide a strategic framework for the forestry sector and help to protect the environment and consider cumulative effects.</p> <p>Positive effect on designated sites as sustainable forest management is required for some Annex II species and assists in catchment management, thereby benefitting aquatic European sites.</p>	
Environment and public goods	<p>Providing forest public services could be for use as a recreational or educational asset which can benefit human health and well-being, and tourism.</p> <p>Environmental enhancement under this action could provide benefits for biodiversity, water quality, land/resource use, and landscape.</p> <p>Positive effect on designated sites as sustainable forest management is required for some Annex II species and assists in catchment management, thereby benefitting aquatic European sites.</p>	<p>Environmental management in line with 'Forest Harvesting and Environment' guidelines</p> <p>Monitoring and recording of the environmental performance of forestry schemes</p>
Supply chain	<p>The action is to increase roundwood harvest which could have negative effects on designated sites and sensitive or valued landscapes depending on the location. However,</p>	<p>Ensuring that efficient management techniques are put in place to ensure protection of the receiving environment,</p>

Priority Actions	Comments	Mitigation / Monitoring
	<p>the action also places a strong emphasis on environmental responsibility and therefore, it would be anticipated that afforestation would not be allowed where it would harm a designated site. Negative effects on biodiversity might also be anticipated from the forestry sector since the primary emphasis is on non-native species - although it is noted that the Forestry Programme includes specific requirements to promote biodiversity in new afforestation.</p> <p>Negative effects on surface water quality might also be anticipated from forestry as a result of slurry/fertiliser run off, siltation, and acidification which could affect WFD targets. Soil degradation (with regards to acidification, nutrient imbalance or soil biodiversity deterioration) can derive from activities from the forestry sector.</p> <p>Forest expansion would create more carbon sinks and have positive effects for air quality and climate change.</p>	particularly biodiversity, soil quality and water quality in line with WFD targets
Wood processing	In the absence of any safeguards the impact of increased wood processing, particularly those that require use of treatment chemicals such as dye and preservatives could have a negative effect on water quality, emissions, soil, and biodiversity depending on the location of the processing facilities.	Ensure environmental safeguards and standards are adhered to, to protect the environment from potential contamination and emissions associated with processing operations
Funding	Whilst not directly linked to the environment, funding from both private and State sectors will be essential for expansion of the sector and implementation of environmental protection measures. In the absence of funding there could be a greater need to reduce spending on environmental measures and climate change mitigation. Overall this action is regarded to be a positive potential impact.	
Forest protection and health	<p>Positive effect on designated sites as sustainable forest management is required for some Annex II species and assists in catchment management, thereby benefitting aquatic European sites. This action will also serve to benefit native flora and fauna through the control of non-native species.</p> <p>Maintaining a healthy forest environment and early detection and control of pest and diseases will have positive effect on human health and general biodiversity and landscape.</p>	
Education training & research	The action does not state whether training will include environmental awareness raising and sustainable practices. Therefore, effects are considered neutral. However, if environment and sustainability training is provided then there will be positive effects as professional development will lead to increased understanding of sustainable forest	Training to promote sustainable management techniques to ensure protection of the receiving environment

Priority Actions	Comments	Mitigation / Monitoring
	management in the context of maintaining and restoring the condition of European sites and the wider environment.	
Quality, standards & certification	The quality focus does not specially state whether environmental criteria could be included. Therefore, effects are considered neutral. However, if environmental standards and quality criteria are to be included then this would have positive effects for the environment.	Incorporate the protection and management of forestry in European sites within criteria used to measure quality and performance. Quality standards could include more general environmental criteria on biodiversity, landscape, and water quality.

Table P Seafood Sector Mitigation Measures

Priority Actions	Comments	Mitigation / Monitoring
Expand the raw materials base	<p>There is an action to develop a strategy to expand shellfish and aquaculture production. In the absence of safeguards this could have adverse effects on the European sites through loss of feeding resources for birds and Annex II species, damage and deterioration of offshore and coastal habitats, and degradation of local habitats resulting from alterations of nutrient balance and waste, as well of flora and fauna deriving from altered gene pools, disease, disturbance or invasive species. Impacts from projected exploitation of novel species new to cultivation have yet to be explored. Special consideration will be required where aquaculture operations occur in the vicinity of Natura 2000 sites.</p> <p>Expansion of shellfish and aquaculture could also affect estuarine water quality and seascape.</p>	<p>For operations in or close to Natura 2000 sites there should be monitoring to ensure that operations are not adversely affecting integrity of Natura 2000 sites</p> <p>Continued EIA screening on aquaculture licence applications.</p>
Enhance the industry's structure and skills	The action is unlikely to affect the environment	
Optimise product added value, export markets & environmental sustainability	<p>Actions relating to the expansion of the sector to marine species of fish, shellfish and seaweed as possible new products could have adverse effects on the European sites through loss of feeding resources for birds and Annex II species, damage and deterioration of offshore and coastal habitats.</p> <p>Expansion could also affect estuarine water quality and seascape.</p> <p>100% seafood exports verified Origin Green will contribute to environmental protection and sustainability credentials within the industry.</p>	For operations in or close to Natura 2000 sites there should be monitoring to ensure that operations are not adversely affecting integrity of Natura 2000 sites

8 Monitoring

Monitoring any significant negative effects of implementing the plan is an essential on-going element of the SEA process. Monitoring assists in evaluating the performance of the Strategy and as such assists in determining whether the identified sustainability objectives are being achieved; allows early identification of unforeseen adverse effects; and thus appropriate remedial action can be taken to deal with any issues or problem areas, particularly in the event where required thresholds are crossed.

It is inappropriate to monitor everything and monitoring proposals should be focused on the following areas that:

- Indicate a likely breach of international, national or local legislation, recognised guidelines or standards;
- May give rise to irreversible environmental, economic or social damage, with a view to identifying trends before such damage occurs; and
- Are subject to uncertainty in the SEA and where monitoring would enable prevention or mitigation measures to be taken.

Table Q summarises Monitoring proposals for *Food Wise 2025*.

Table Q Monitoring

Sector	Food Wise 2025 Action	Issue	Indicator	Monitoring	Responsibility	Timescale	Interaction with Other Organisations
General	Use of Origin Green programme	Many of the actions require uptake of the Origin Green programme. To ensure uptake and success, and realisation of environmental benefits this needs to be monitored on a farm by farm basis and on a facility by facility basis.	<ul style="list-style-type: none"> Number of farms and facilities registered under the Origin Green programme as a percentage of total in the Country 	An annual report will be generated outlining an analysis on the performance and uptake of the Origin Green programme.	Bord Bia	Annually	Farmers, growers, processors
Chapter 5	Growth opportunities	Sectoral expansion has potential for negative effects on water quality, biodiversity, soil quality, GHG emissions, waste generation, and landscape through intensification, change in land use, use of fertilisers, and increase in animal numbers.	See sector specific monitoring below		-	-	-
Dairy, Beef & Sheep	Farm, grassland and soil management	<p>Negative effects from use of fertilisers on water quality, species, and habitats.</p> <p>Increased GHG emissions from liming.</p> <p>Increased GHG emissions from increased livestock numbers.</p> <p>Negative effects on biodiversity and designated sites from land pressures and use of fertilisers, manures etc.</p>	<ul style="list-style-type: none"> Ecological and chemical status of water bodies Pollution incidents to land or water Concentrations of nitrates and phosphorous in water bodies Sampling water bodies against WFD targets Area of land using liming and associated emissions footprint Extent and condition of protected areas in or near farmland 	<p>A review will be undertaken on an annual basis of EPA water quality monitoring results in order to identify trends in terms of nutrient loading to catchments, chemical and biological water status with regard to the water status required under the WFD.</p> <p>Catchment/regional monitoring where increased livestock numbers are anticipated</p> <p>A review of DAFM/Teagasc Catchment assessments to monitor</p>	DAFM	Annually	NPWS/ EPA

Sector	Food Wise 2025 Action	Issue	Indicator	Monitoring	Responsibility	Timescale	Interaction with Other Organisations
			<ul style="list-style-type: none"> Numbers and type of livestock – proxy for methane emissions 	<p>changes in nutrient loading</p> <p>An annual report will be issued detailing the results of an analysis of GHG emissions arising from agriculture. This report will report on the sectorial emissions and identify any trends over time.</p>			
Sheep	Processing actions	Increased demand on the disposal of sheep carcasses after boning may have adverse effects for waste management capacity	<ul style="list-style-type: none"> Volume of sheep carcasses for disposal against local waste facility capacity 	DAFM will report on the animal disposal of annual carcasses and identify any capacity issues at waste acceptance facilities.		Annually	
Cereals/ Tillage/ Grassland	Farmer actions	<p>Potential adverse impacts on the integrity of European sites if the changes in the type of crop would affect supporting roles played for European sites</p> <p>Change of land use and intensification of harvest patterns can also affect landscape</p>	<ul style="list-style-type: none"> Changes in land use land cover over time Landscapes measures implemented under agri-schemes Extent and condition of protected areas in or near farmland 	<p>DAFM to report annually on changes in cropping pattern and permanent pastures to monitor emerging trends.</p> <p>An annual workshop will be held with relevant state agencies and stakeholders where impacts arising due to the expansion of agricultural activities will be discussed. Observed impacts and/or potential impacts will be discussed and mitigation measures agreed where required.</p> <p>A review of landscape character will be undertaken (on a 5 year</p>	DAFM	Annual/ 5 years	EPA
	Processor actions	Change of land use and intensification of harvest patterns has a potential negative effect on landscape and European designated sites (if changes to land use remove the supporting role that some fields play for bird species using SPAs)					

Sector	Food Wise 2025 Action	Issue	Indicator	Monitoring	Responsibility	Timescale	Interaction with Other Organisations
				basis) which will entail a review of LCA's undertaken by local authorities. This review will include undertaking consultation with Local authorities, Department of Environment Community and Local Government and Department of Arts Heritage and Gaeltacht.			
	Cross cutting actions	Change of land use and intensification of harvest patterns has a potential negative effect on landscape and European designated sites					
PCF & Alcoholic Beverages	Department and state agencies	Potential for negative effect on landscape, biodiversity and water quality from intensification of harvest patterns and use of fertilisers	<ul style="list-style-type: none"> • Ecological and chemical status of water bodies • Pollution incidents to land or water • Concentrations of nitrates and phosphorous in water bodies • Sampling water bodies against WFD targets 	A review will be undertaken on an annual basis of EPA water quality monitoring results in order to identify trends in terms of nutrient loading to catchments, chemical and biological water status with regard to the water status required under the WFD.	DAFM	Annually	
Forestry	Expansion of the forest resource	Increased afforestation has potential for negative effects on designated sites, landscape, biodiversity, water quality, and soil degradation	<ul style="list-style-type: none"> • Soil pH • Soil organic matter/ carbon content 	A review will be undertaken on an annual basis of EPA water quality monitoring results in order	DAFM	Annually	EPA

Sector	Food Wise 2025 Action	Issue	Indicator	Monitoring	Responsibility	Timescale	Interaction with Other Organisations
	Supply Chain	Increased roundwood harvest has potential for negative effects on designated sites, landscape, biodiversity, water quality, and soil degradation	<ul style="list-style-type: none"> • Changes in land use land cover over time • Ecological and chemical status of water bodies • Pollution incidents to land or water • Concentrations of nitrates and phosphorous in water bodies • Sampling water bodies against WFD targets 	to identify trends in terms of nutrient loading to catchments, chemical and biological water status with regard to the water status required under the WFD.			
	Wood Processing	Use of treatment chemicals in wood processing could have negative effects on water quality, emissions, and soil contamination depending on the location of the processing facility and methods/standards employed	<ul style="list-style-type: none"> • Soil sampling – pH, chemicals • Ecological and chemical status of water bodies • Pollution incidents to land or water • Concentrations of nitrates and phosphorous in water bodies • Sampling water bodies against WFD targets 	An annual review of wood processing facilities Industrial Emissions Licenses will be undertaken to identify any impacts arising from these facilities and to recommend industry wide improvements where required.	DAFM	Annually	EPA
Seafood	Expand the raw materials base	Potential negative effects on European designated sites, biodiversity, water quality and seascape from sector expansion	<ul style="list-style-type: none"> • Ecological and chemical status of water bodies • Extent and condition of marine protected areas in or near seafood growing or fishing waters 	A review will be undertaken on an annual basis of EPA water quality monitoring results in order to identify trends in terms of nutrient loading to catchments, chemical and biological water status			EPA

Sector	Food Wise 2025 Action	Issue	Indicator	Monitoring	Responsibility	Timescale	Interaction with Other Organisations
				with regard to the water status required under the WFD.			
	Optimise product added value, export markets & environmental sustainability	Potential negative effects on European designated sites, biodiversity, water quality and seascape from sector expansion		Continue existing conditionality for new licence applications including EIA screening and stakeholder consultation.			
Cross Cutting		Birds Biodiversity (including pollinators)		DAFM to develop suitable monitoring of its RDP (GLAS) programme in line with proposals under RDP 2014-2020 (GLAS) to monitor and report on general impact on biodiversity (including pollinators). DAFM in consultation with other relevant government departments and state agencies to take account of other national monitoring initiatives, in particular regarding the conservation status of Natura 2000 sites.			

9 Conclusion and Key Recommendations

The SEA and AA processes carried out during the preparation of *Food Wise 2025* has ensured that any potential significant environmental impacts associated with implementation of the *Food Wise 2025* have been identified and that they have been given appropriate consideration. Consultation on the draft *Food Wise 2025*, SEA Environmental Report and NIR has further contributed to the development and finalisation of *Food wise 2025*, as approved by the Minister of Agriculture, Food and the Marine.

As part of the SEA process a significant number of recommendations were made particularly in relation to monitoring and mitigation. Among these recommendations were the following:

- The inclusion of an sustainability sub-committee as part of the High Level Implementation Committee (HLIC) to monitor the level of achievement in relation to sustainability during the implementation phase;
- Monitoring on an annual basis by DAFM of total livestock numbers and the drafting of a report in conjunction with EPA in relation to GHG and ammonia emissions;
- DAFM to coordinate a new monitoring programme in relation to biodiversity including birds, pollinators and the effects of ammonia depositions on Natura 2000 sites;
- The *Food Wise 2025* HLIC to commission further work on the development of cost effective mitigation measures in relation to GHGs and ammonia;
- DAFM to undertake a cost benefit analysis of a *Sustainable Growth* Scenario.

Outlined below are the key influences on the development of *Food Wise 2025*:

- Reinforcement of decision to place sustainability and sustainable intensification as a cornerstone of Food Wise 2025.
- Decision to include a specific chapter and actions on sustainability.
- Decision to adopt as a guiding principal Ireland's national and international obligation in relation to GHG and ammonia, water quality and biodiversity within Food Wise 2025.
- Decision to frame all actions within Food Wise 2025 to ensure that sustainability is achieved.
- Decision to set quantitative targets in the context of available mitigation to ensure sustainability.
- Inclusion within Food Wise 2025 of improved monitoring and mitigation to ensure and verify sustainability.
- Commitment to increased emphasis at implementation phase to the promotion of increased research, knowledge transfer and rollout of new mitigation measures to improve compliance and ensure sustainability.
- Formation of Sustainability Sub-Committee by the HLIC to oversee and guide sustainability actions during the implementation phase.
- Decision to include an Implementation Chapter within Food Wise 2025 which fully reflects the AA and SEA process and highlights the findings and recommendations of the SEA Environmental Report.



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