

# **Introducing Market Restrictions on Problematic Single-Use Plastic Items in Scotland**

**Strategic Environmental Assessment**

**Environmental Report**

**October 2020**

## Non-Technical Summary

### Introduction

The Scottish Government is seeking views on the introduction of new legislation to restrict the supply of eight single-use plastic items and all oxo-degradable products, in Scotland, with the intended effect of reducing the volume and impact of plastic pollution within terrestrial and marine environments.

The single-use plastic items targeted by these proposed measures have been identified as being amongst the most commonly found items in beaches throughout the European Union and as such are responsible for extensive and enduring plastic pollution across Scotland and beyond.

A Strategic Environmental Assessment (SEA) of the proposed market restrictions is being undertaken to assess its likely significant environmental effects and identify ways to enhance environmental benefits and minimise or avoid environmental harms. The findings are provided in this Environmental Report (ER). This Non-Technical Summary (NTS) provides an overview of the Environmental Report produced as part of the SEA of the proposed market restrictions.

This Environmental Report presents the findings of the SEA for consultation. The following sections of this NTS:

- provide an overview of the policy context for the proposed market restrictions;
- describe the SEA process together with how it is being applied to proposed market restrictions;
- describe the approach to undertaking the SEA;
- summarise the findings of the SEA on the relevant topic areas;
- present the conclusions and recommendations of the SEA.

### What does the restriction of single-use plastic products placed on the market in Scotland mean?

Single-use items are generally discarded immediately after initial use and are therefore an inefficient use of valuable resources. Single-use plastic items are prevalent due to low cost and convenience, performing a required task at a required time, before immediately being discarded. Plastic has a significant degradation period, taking many years to break down. When such degradation does occur, plastic does not biodegrade, but rather breaks up into smaller and smaller fragments referred to as microplastics, which are known to leak into, and persist within the environment.

The proposed market restrictions would prohibit by law, the supply of certain single-use plastic items and all oxo-degradable plastic products in Scotland. The single-use and oxo-degradable plastic items in scope are consistent with those listed in EU Single-use Plastics Directive Annex Part B, as follows:

1. Cotton bud sticks, except if they fall within the scope of Council Directive 90/385/EEC<sup>1</sup> or Council Directive 93/42/EEC<sup>2</sup>;
2. Cutlery (forks, knives, spoons, chopsticks);
3. Plates;
4. Straws, except if they fall within the scope of Directive 90/385/EEC or Directive 93/42/EEC;
5. Beverage stirrers;
6. Sticks to be attached to and to support balloons, except balloons for industrial or other professional uses and applications that are not distributed to consumers, including the mechanisms of such sticks;
7. Food containers made of expanded polystyrene, i.e. receptacles such as boxes, with or without a cover, used to contain food which:
  - a. is intended for immediate consumption, either on-the-spot or take-away,
  - b. is typically consumed from the receptacle, and
  - c. is ready to be consumed without any further preparation, such as cooking, boiling or heating, including food containers used for fast food or other meal ready for immediate consumption, except beverage containers, plates and packets and wrappers containing food;
8. Beverage containers made of expanded polystyrene, including their caps and lids;
9. Cups for beverages made of expanded polystyrene, including their covers and lids.

A market restriction has already been implemented in Scotland in respect of plastic-stemmed cotton buds, in keeping with the requirements of the Directive.

As stated, the restriction on the specified plastic products will be extended to oxo-degradable plastics, which are defined under Article 3(3) of the Single-use Plastics Directive as being;

‘plastic materials that include additives which, through oxidation, lead to the fragmentation of the plastic material into micro-fragments or to chemical decomposition<sup>3</sup>’.

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<sup>1</sup> European Union (1990) Council Directive 90/385/EEC of 20 June 1990 on the approximation of the laws of the Member States relating to active implantable medical devices [Online]. Available at: <https://eur-lex.europa.eu/>

<sup>2</sup>European Union (1993) Council Directive 93/42/EEC of 14 June 1993 concerning medical devices [Online]. Available at: <https://eur-lex.europa.eu/>

<sup>3</sup> European Union (2019) Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment, Article 3(3) [Online]. Available at: <https://eur-lex.europa.eu/>

These materials are included within the scope of the proposed measures as they have potential to cause widespread harm across several topic areas, as is discussed throughout this Environmental Report.

The proposed market restrictions have the intended effect of reducing plastic and microplastic waste and resultant pollution within the landscape, ecosystems and habitats of Scotland.

## What is Strategic Environmental Assessment (SEA)?

SEA is a statutory requirement under the Environmental Assessment (Scotland) Act 2005, to assess the likely significant environmental effects that a public plan, programme or strategy will have on the environment if implemented. The process identifies how environmental damage can be avoided or reduced by suggesting how it can be changed. It also allows the public to give their view on the programme and its potential environmental impacts. SEA is comprised of five key stages:

1. **Screening** – determining whether a plan requires a SEA;
2. **Scoping** – establishing significant environmental topics, setting the environmental baseline and consulting through a Scoping Report;
3. **Environmental Assessment** – assessing and recording the potential environmental impact of the plan and consulting on the likely significant effects of the draft plan and Environmental Report;
4. **Post Adoption Statement (PAS)** – undertaking a public consultation exercise on the Environmental Report and developing the monitoring strategy to assess progress once adopted;
5. **Monitoring** – making the final decision on how or whether to proceed with the proposed activity, plan or strategy, informing the public about that decision and monitoring the effects of implementation.

A combined screening and scoping report was submitted to statutory consultees for a 4-week consultation period which ended on 21 September 2020. The environmental assessment has been amended based on the recommendations received. This is documented in Appendix A.

The proposed market restrictions are set out in the consultation document, published alongside the SEA Environmental Report. The responses received and findings of the SEA will help inform the final outcome and will be reflected upon in the Post Adoption Statement.

Scottish Government will monitor the implementation and environmental effects resulting from implementing restrictions on single-use plastic items on the Scottish market.

## How have the environmental effects of the restriction of single-use plastic items placed on the market in Scotland been assessed?

The activities associated with introducing market restrictions on single-use plastic items have been analysed to identify and evaluate (where applicable) the likely significant effects that could arise from the implementation of any restrictions. The effects of the proposed market restrictions have been considered with respect to the following topic areas that have been scoped into the SEA following the scoping stage: material assets, biodiversity, climatic factors, soil, and landscape and visual impacts.

This environmental assessment has adopted a single tier approach to consider the significant effects associated with the implementation of the proposed market restrictions in relation to each of the five aforementioned SEA topic areas identified. The assessment questions have been developed to ensure that the SEA focuses on significant environmental impacts relevant to each scoped in topic area.

The assessment questions for this SEA are presented in Table NTS 1 below.

**Table NTS 1 SEA assessment questions**

SEA Topic Area	Question
Biodiversity, Flora and Fauna	<p>Will it protect and/or enhance designated nature conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?</p> <p>Will it support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions?</p> <p>Will it help avoid pollution of the terrestrial, coastal and marine environments?</p>
Climatic Factors	Will the alternative option contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland?
Material Assets	<p>Will it contribute towards achieving Scotland's waste targets?</p> <p>Will it increase the economic value and utility of affected materials?</p> <p>Will it reduce 'leakage' of material to landfill or energy recovery or as litter?</p>
Soil	Will the proposal contribute to reducing levels of soil contamination?
Landscape and Visual Impacts	Will the alternative option reduce the visual effects from littering of materials into terrestrial and marine environments and improve their scenic qualities?

## What are the likely significant environmental effects of the restriction of single-use plastic items placed on the market in Scotland?

Table NTS 2 presents a summary of proposed measures against SEA topic areas scoped into this analysis, namely material assets, biodiversity, climatic factors, soil, and landscape and visual impacts. The assessment provides commentary on any likely significant positive and negative effects and was identified as follows:

- **No cumulative significant negative effects have been identified during the assessment.** The proposed market restrictions are expected to generate an additional 1,440 tonnes of waste as we shift from plastics to heavier alternatives (e.g. cardboard and wood). This amounts to a 0.001% increase in total Scottish waste and is therefore deemed insignificant. The proposed measures do not require additional infrastructure facilities or major changes to the way waste is collected and managed in Scotland.
- **No significant cumulative positive effects associated with the proposed measures have been identified.** Our analysis shows that the proposed measures will generate cumulative positive effects in respect of climatic factors (achieving carbon savings of 6,188 tonnes CO<sub>2</sub>e.), landscape/visual impacts and biodiversity related to reduced littering. **The magnitude of these positive effects is unlikely to be significant when compared to major waste policies being implemented in Scotland (e.g. ban on landfilling of biodegradable municipal waste and deposit return scheme).**

### Other Environmental Effects

The assessment presented in the Environmental Report has demonstrated that effects associated with proposed measures on, air, water, population, human health, and cultural heritage are unlikely to be significant. This principally reflects the nature of proposed measures and target materials. See Section 3.2.3 for further details.

The key to each assessment score is shown below.

Score Key:	++	+	0	-	--	?
	Significant positive effect	Minor positive effect	No overall effect	Minor negative effect	Significant negative effect	Score uncertain

NB: where more than one symbol is presented in a box it indicates that the SEA has found more than one score for the category. Where the scores are both positive and negative, the boxes are deliberately not coloured (i.e. 'no overall effect'). Where a box is coloured but also contains a "?" this indicates uncertainty over whether the effect could be a minor or significant effect although a professional judgement is expressed in the colour used. A conclusion of uncertainty arises where there is insufficient evidence for expert judgement to conclude an effect.

Table NTS 2 Summary of effects from targeted single-use plastic items.

Measure No.	Single-use plastic item	Alternative option	Material Assets	Climatic Factors	Landscape and Visual Impacts	Biodiversity, flora and fauna	Soil
1	Cutlery	Wooden Cutlery	+/?	++	+/?	+/?	+
2	Plates	Wax-coated Paper Plates	+/?	++	+/?	+/?	+
3	Beverage Stirrer	Wooden Stirrer	+/?	+	+/?	+/?	+
4	Straws	Wax-line Paper Straws	+/?	++	+/?	+/?	+
5	Balloon sticks	Cardboard Balloon Sticks	+/?	+	+/?	+/?	+
6	Food containers made of expanded polystyrene	Wax-coated Cardboard Boxes	+/?	++	+/?	+/?	+
7 <sup>4</sup>	Cups and beverage containers made of expanded polystyrene	Plastic-coated paper cups	-/?	-	+/?	+/?	+/?
8	Oxo-degradable plastics	Conventional plastics	0/?	+	0	+/?	+/?

<sup>4</sup> This category covers both item 8 and 9 listed in part B of the Directive's Annex: Beverage containers made of expanded polystyrene, including their caps and lids, and Cups for beverages made of expanded polystyrene, including their covers and lids.

## How can potential environmental effects be effectively managed, mitigated or enhanced?

A number of measures have been identified to enhance the environmental benefits of the proposed market restrictions and are outlined within the relevant sections. Key recommendations are:

- Encourage citizens to eliminate single-use items in favour of multi-use reusable alternatives;
- Ensure recycling infrastructure is available to capture and recycle non-plastic alternatives; and
- Design an awareness campaign to ensure that citizens are well informed about new measures and the best recycling route for alternative items.

## What monitoring is proposed?

Section 19 of the Environmental Assessment (Scotland) Act 2005 requires the Responsible Authority, being the Scottish Government, to monitor significant environmental effects of the implementation of market restrictions on certain single-use plastic and all oxo-degradable plastic items in Scotland. This will require development of a monitoring framework that will require consideration of the following:

- Litter and beach clean-up data collected in Scotland can be used to monitor changes in observable litter following the implementation of the proposed market restrictions.
- Existing monitoring could be used to measure volumes of microplastics in soil.
- Material Recovery Facilities (MRFs) could monitor throughput to determine any changes to plastic waste volume over time.

Monitoring proposals are explored in more detail in Section 10.2; however, these are not exhaustive. It is anticipated that as newer monitoring programmes are developed, these may be used to gather further data in relation to the effects of the proposed market restrictions across all relevant topic areas.

## What were the conclusions and recommendations of the SEA?

**The Environmental Report concludes that the proposed market restrictions will have positive cumulative environmental effect across all relevant impact areas.** Specifically, shifting production and consumption from plastic to alternative, primarily biodegradable, materials will:

- **Climatic Factors** – reduce embedded carbon impacts associated with targeted items.
- **Material Assets** – reduce overall consumption of finite fossil fuel resources.
- **Landscape and Visual** – reduce the cumulative impacts of litter caused by long-life plastics.
- **Biodiversity** – reduce the amount of plastic entering and degrading in terrestrial and marine environmental where it poses a threat to flora and fauna.
- **Soil** – reduce the amount of plastic entering and degrading within soil.

The report proposes using a combination of litter and beach clean, waste composition, and soil sampling data to monitor and verify these expected benefits.

The report also acknowledges that additional, parallel measures are needed to prevent single-use consumption and help Scotland transition from a throw-away society.

### How can I comment on this Environmental Report?

Public views are now sought on the proposed market restrictions and on this Environmental Report.

We would welcome your views on any aspect of this Environmental Report. We are particularly interested to receive your response to the following questions:

1. To what extent does the Environmental Report set out an accurate description of the current baseline and the business as usual scenario? (Please give details of additional relevant sources)
2. Do you think that the Environmental Report has correctly identified the likely significant effects of the proposed restriction on single-use and oxo-degradable plastics placed on the market in Scotland?
3. Do you agree with the recommendations and proposals for mitigation and enhancement of the environmental effects set out in the Environmental Report? (If not, what do you think should be the key recommendations and why?)
4. Are you aware of any further information that will help to inform the findings of the assessment? (Please give details of additional relevant sources.)
5. Do you agree with the proposed arrangements for monitoring the significant effects of the proposed restriction? (If not, what measures do you propose?)

The consultation runs until 4 January 2021. Comments on the proposed market restrictions and the Environmental Report can be submitted online on the Introducing Market Restrictions on Problematic Single-use Plastic Items in Scotland Citizen Space which can be accessed [here](#).

Following the conclusion of the consultation period, the responses received on the proposed market restrictions and this Environmental Report will be analysed and reported. Key messages from respondents, including those of the various stakeholder groups, will be highlighted and the findings of the analysis will be considered in the final determination of the proposed market restrictions.

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# 1. Introduction

**This section provides an outline of the EU Single-Use Plastics Directive alongside the requirements of the Environmental Assessment (Scotland) Act 2005. It then presents the objectives, purpose and content of this Environmental Report.**

## 1.1 Background to EU SUP Directive

The European Union's Single-use Plastics directive (SUP Directive) was adopted by European Parliament and European Council on 5 June 2019. The Directive requires that members of the European Union transpose it into national laws, regulations and administrative provisions.

The SUP Directive applies to the single-use plastic products listed, products made from oxo-degradable plastic and to fishing gear containing plastic. The Directive covers single-use plastic products that are fossil-based and bio-based, regardless of whether they are recyclable, biodegradable or compostable. Single-use plastic products made of multi-layered or composite materials, such as plastic-coated paper or plastic-lined cartons, are also in scope of the SUP Directive.

A single-use plastic product, for the purpose of the SUP Directive, is a product that is made wholly or partly from plastic and *“is not conceived, designed or placed on the market to accomplish, within its life span, multiple trips or rotations by being returned to a producer for refill or re-used for the same purpose for which it was conceived.”*<sup>5</sup>

The SUP Directive acknowledges that plastic plays an important role in everyday life due to its versatility and subsequent breadth of application, together with its low cost and high performance. The Directive also denotes however, that the growing use of short-lived and single-use plastics which do not lend themselves to cost effective recycling has precipitated linear and excessively wasteful consumption models. The prevalence of such products is directly linked to pollution of oceans, rivers and land ecosystems, representing a significant global challenge.

In its communication of 16 January 2018, entitled 'A European Strategy for Plastics in a Circular Economy'<sup>6</sup>, The European Commission advised of the need to combat the steady increase in plastic waste generation, and the leakage of plastic waste into the European and global environment, and specifically the marine environment.

The Strategy for Plastics was developed in pursuance of a more circular economy in which the production and subsequent utility of plastic products would adhere to the principles of reuse, repair and recycling. Concurrently, the strategy called for the establishment of a specific legal framework that could mitigate environmental, health and economic detriments caused by the continued use of certain plastic products.

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<sup>5</sup> European Union (2019) [Directive \(EU\) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment](https://eur-lex.europa.eu/) [Online]. Available at: <https://eur-lex.europa.eu/>

<sup>6</sup> European Commission (2018) [A European Strategy for Plastics in a Circular Economy](https://ec.europa.eu/) [Online]. Available at: <https://ec.europa.eu/>

The single-use plastic products covered by measures under this Directive are among the most-commonly found items on beaches within the European Union. The items specified within Article 5 are estimated to represent around 50% of the single-use plastics found, in counts, on beaches within the EU.

Reducing marine litter is a key action under UN Sustainable Development Goal 14<sup>7</sup>, which call for the conservation and sustainable use of oceans, seas and marine resources for sustainable development. The SUP Directive has been identified as a way in which the European Union ‘plays its part’ in the prevention and intercedence of marine litter. It is an essential element of the Commission’s Circular Economy Action Plan<sup>8</sup> as it stimulates the production and use of sustainable alternatives to single-use plastic products. The Directive is complemented by other measures taken against marine Pollution, such as the Directive on Port Reception Facilities<sup>9</sup> that has been constructed to tackle marine waste originating from ships, and which necessitates that waste generated on ships or collected at sea must be returned to land for recycling and processing.

The Directive will also contribute to the UN Sustainable Development Goal 12<sup>10</sup> which ensures sustainable consumption and production patterns, forming an integral part of the 2030 Agenda for Sustainable Development adopted by the UN General Assembly on 25 September 2015. Further, by retaining the value of products and materials for as long as possible and generating less waste, the economy of the European Union will be more competitive and more resilient while alleviating pressure on precious resources within the environment. The Directive will have the predicted effect of avoiding the emission of 3.4 million tonnes of CO<sub>2</sub> equivalent throughout the EU; and is also estimated to avoid environmental damages which would cost the equivalent of €22 billion by 2030. In relation to economic benefit, the Directive is predicted to save consumers a projected €6.5 billion.<sup>11</sup>

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<sup>7</sup> UNDP (2020) [Goal 14: Conserve and sustainably use the oceans, seas and marine resources](https://www.un.org/); [Online]. Available at: <https://www.un.org/>

<sup>8</sup> European Commission (2015) [Closing the Loop Press Release](https://ec.europa.eu/) [Online]. Available at: <https://ec.europa.eu/>

<sup>9</sup> European Commission (2018) [Proposal for a Directive of the European Parliament and of the Council on Port Reception Facilities for the Delivery of Waste from ships, repealing Directive 2000/59/EC and amending Directive 2009/16/EC and Directive 2010/65/EU](https://eur-lex.europa.eu/) [Online]. Available at: <https://eur-lex.europa.eu/>

<sup>10</sup> UNDP (2020) [Goal 12: Responsible consumption and production](https://www.undp.org/) [Online]. Available at: <https://www.undp.org/>

<sup>11</sup> European Commission (2015) [‘Single-Use Plastics’ Press Release](https://ec.europa.eu/) [Online]. Available at: <https://ec.europa.eu/>

**Table 1-1 Key facts on the introduction of market restrictions on problematic single-use plastic items in Scotland**

<b>Responsible Authority</b>	The Scottish Government
<b>Title of PPS</b>	Introducing Market Restrictions on Problematic Single-Use Plastic Items in Scotland
<b>What prompted the PPS?</b>	In the 2019-20 Programme for Government, the Scottish Government announced plans to meet or exceed the standards set out in the European Union Single-Use Plastics Directive Article 5 (Restrictions on placing on the market) in order to tackle marine litter coming from the most common single-use plastic products, with a public consultation anticipated to take place in late 2020. This commitment by the Scottish Government will result in the implementation of market restriction on the supply of many problematic single-use plastic and oxo-degradable plastic products, each of which has been identified as having readily available, more sustainable alternatives already present within the domestic marketplace.
<b>Subject (e.g. transport)</b>	Waste
<b>Period covered by PPS</b>	2020 onwards
<b>Frequency of updates</b>	A further update on the Scottish Government’s plan to introduce market restriction on the supply of a number of single-use plastics will be provided post-consultation. Thereafter, monitoring and evaluation will be conducted in line with the relevant sections and Articles of the Single-Use Plastics Directive.
<b>Area covered by PPS</b>	Scotland-wide
<b>Purpose and/or objectives of PPS</b>	The Scottish Government fully supports the EU vision of phasing-out single-use plastics wherever possible. By introducing a market restriction on single-use plastics, this will contribute to the achievement of Scotland’s existing waste policies and targets and will also help to reduce single-use plastic litter in Scotland’s terrestrial and marine environments. Furthermore, the Scottish Government intends to not only implement the policy measures set out in the EU SUP Directive but is committed to building on these to strengthen Scotland’s position as a leader in the Circular Economy.

<b>PPS Contact</b>	David Barnes Moray House, Forthside Way Stirling FK8 1QZ Phone: 01786 433 969 Email: <a href="mailto:david.barnes@zerowastescotland.org.uk">david.barnes@zerowastescotland.org.uk</a>
<b>SEA Contact</b>	Michael Lenaghan Moray House, Forthside Way Stirling FK8 1QZ Phone: 07712 328341 Email: <a href="mailto:michael.lenaghan@zerowastescotland.org.uk">michael.lenaghan@zerowastescotland.org.uk</a>

## 1.2 Background to Strategic Environmental Assessment (SEA)

In 2005 the Scottish Government established the Environmental Assessment (Scotland) Act.

This Act, which came into force on 20 February 2006, replaces the Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004 as the transposition vehicle for the SEA Directive (European Directive 2001/42/EC “the assessment of the effects of certain plans and programmes on the environment”)<sup>12</sup>. The Act requires that environmental assessment is undertaken on all plans, programmes and strategies of a public nature which are likely to have significant environmental effects. The main benefits of the SEA process as set out in the 2005 Act are as follows:

- SEA improves the information base for plan, programme and strategy (PPS) preparation, providing clear information on the possible impact on the environment and influencing the preparation of the PPS, while building in better environmental protection and outcomes;
- SEA provides a rigorous system for including environmental factors in decision-making, thus supporting a sustainable development approach;
- SEA facilitates an improved consultation process, including the rigorous assessment of reasonable alternatives;
- SEA also facilitates transparency, by requiring that an analysis of public comments is undertaken and made publicly available;

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<sup>12</sup> European Commission (2004) [European Directive 2001/42/EC “The Assessment of the Effects of Certain Plans and Programmes on the Environment](https://ec.europa.eu/) [Online]. Available at: <https://ec.europa.eu/>

- SEA facilitates the consideration of cumulative effects and provides a means to prevent, reduce and, as fully as possible, offset any potentially adverse environmental effects.

The objectives of the SEA Directive, as set out in Article 1, are “to provide a high level of protection to the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development”<sup>13</sup>. These objectives were considered essential within the context of Article 5 of the SUP Directive.

The SUP Directive aims to tackle pollution from single-use plastics and fishing gear (these being the items most commonly found on European beaches) and promote the transition to a circular economy. The SUP Directive applies to the single-use plastic products listed, products made from oxo-degradable plastic, and to fishing gear containing plastic.

Scottish Government has screened the introduction of market restrictions on single-use plastic items in Scotland against the requirements of the Environmental Assessment (Scotland) Act 2005 and identified that, as it is likely to have significant environmental effects, a Strategic Environmental Assessment is required. This provides a systematic process for identifying, reporting and mitigating the environmental impacts of introducing market restrictions on single-use plastic items. The SEA is an iterative process and comprises the following distinct stages:

- **Screening** – determining and agreeing whether a plan requires a SEA;
- **Scoping** – establishing significant environmental topics, setting the environmental baseline, developing appropriate SEA objectives and consulting through a Scoping Report;
- **Environmental Assessment** – assessing and recording the potential environmental impact of the plan and consulting on the likely significant effects on both and draft plan and Environmental Report;
- **Post Adoption Statement (PAS)** – undertaking a public consultation exercise on the Environmental Report (to accompany the draft plan, programme or strategy) and developing the monitoring strategy to assess progress once adopted;
- **Monitoring** – making the final decision on how or whether to proceed with the proposed activity, plan or strategy taking into account the comments resulting

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<sup>13</sup> European Commission (2004) [European Directive 2001/42/EC “The Assessment of the Effects of Certain Plans and Programmes on the Environment \[Online\]. Available at: https://ec.europa.eu/](https://ec.europa.eu/)

from the consultation and the contents of the Environmental Report; informing the public about that decision. Monitoring significant environmental effects of implementation and taking appropriate remedial action for unforeseen environmental effects are also part of the final monitoring stage.

### 1.3 Purpose of Environmental Report

This Environmental Report contains the SEA findings on the likely environmental implications arising from the introduction of statutory Scottish market restrictions on single-use and oxo-degradable plastic items, specifically with reference to those topic areas scoped in during the initial scoping phase.

The objectives of the environmental assessment concerning the introduction of market restrictions for single-use and oxo-degradable plastic items in Scotland are:

- to ensure that the likely significant environmental effects arising from an introduction of market restrictions on specified single-use plastic items and oxo-degradable plastic items are identified, characterised and assessed;
- to provide a framework for monitoring the potential significant effects arising from the restriction of specific single-use and oxo-degradable plastic items being placed on the Scottish market;
- to give the statutory consultees, stakeholders and the wider public the opportunity to review and comment upon the environmental effects that market restrictions on single-use and oxo-degradable plastic products may have on them, their communities and their interests, and to encourage and support them to make responses detailing any such effects and how to mitigate these;
- to inform Scottish Government's decisions on transposition of Article 5; and
- to demonstrate that the introduction of Scottish market restrictions on single-use and oxo-degradable plastic items has been carried out in a manner deemed to be consistent with the requirements of the SEA Act.

This report has been produced for inclusion within the public consultation stage of the policy development process. It identifies, describes and evaluates the likely significant environmental effects resulting from a restriction on specified single-use and oxo-degradable plastic products being placed on the Scottish market. This report also identifies ways in which adverse effects can be avoided, managed or mitigated and how any positive effects can be enhanced. Economic impacts of the proposed market restrictions are explored in the Business Regulatory Impact Assessment (BRIA) and equality aspects are assessed in the Equality Impact Assessment.

## 1.4 Environmental Report Structure

This Environmental Report conveys the findings of the SEA and is set out as follows:

- **Section 1** – Provides an introduction and background to the SUP Directive along with an overview of the SEA process.
- **Section 2** – Provides an overview of Article 5 of the SUP Directive and considers its implementation in the Scottish policy context.
- **Section 3** – Sets out the approach to the SEA, the process to date and scope of the assessment along with mitigating and monitoring proposals.
- **Section 4** – Provides an in-depth analysis of the Climatic Factors Topic area, its interdependencies, baseline characteristics and potential impacts.
- **Section 5** – Provides an in-depth analysis of the Material Assets Topic area, its interdependencies, baseline characteristics and potential impacts.
- **Section 6** – Provides an in-depth analysis of the Landscape and Visual Impacts Topic area, its interdependencies, baseline characteristics and potential impacts.
- **Section 7** – Provides an in-depth analysis of the Biodiversity Topic area, its interdependencies, baseline characteristics and potential impacts.
- **Section 8** – Sets out analysis on possible cumulative effects across all topic areas.
- **Section 9** – Provides conclusions and recommendations resulting from the assessment.
- **Section 10** - Sets out the proposed programme of works and the next steps in the transposition of SUP Directive Article 5 and the SEA process.

Abbreviations are provided in Appendix C.

## 2. Market Restriction of Single-Use Plastic items being placed on the market in Scotland

**This section provides an overview of SUP Directive Article 5. It outlines: those single-use and oxo-degradable plastic products that fall within its scope; the context for the Scottish Government’s decision to introduce market restrictions on single-use and oxo-degradable plastics; and the development of the consultation paper.**

### 2.1 EU Single-Use Plastics Directive - Article 5

Article 5 introduces a restriction on the placing of certain single-use plastics onto the market, stating: “*Member States shall prohibit the placing on the market of the products listed in Part B of the Directive’s Annex and of products made from oxo-degradable plastic*”. The Directive Annex Part B details nine categories of single-use plastic products planned for market prohibition. The products identified in the SUP Directive are subject to a range of measures including consumption reduction initiatives, market restrictions, product and marking requirements, extended-producer responsibility schemes, separate collection targets and awareness raising.

The single-use plastic products listed in part B of the Annex are:

1. Cotton bud sticks, except if they fall within the scope of Council Directive 90/385/EEC<sup>14</sup> or Council Directive 93/42/EEC<sup>15</sup>;
2. Cutlery (forks, knives, spoons, chopsticks);
3. Plates;
4. Straws, except if they fall within the scope of Directive 90/385/EEC or Directive 93/42/EEC;
5. Beverage stirrers;
6. Sticks to be attached to and to support balloons, except balloons for industrial or other professional uses and applications that are not distributed to consumers, including the mechanisms of such sticks;
7. Food containers made of expanded polystyrene, i.e. receptacles such as boxes, with or without a cover, used to contain food which:
  - a. is intended for immediate consumption, either on-the-spot or take-away,
  - b. is typically consumed from the receptacle, and
  - c. is ready to be consumed without any further preparation, such as cooking, boiling or heating, including food containers used for fast food or other meal ready for immediate consumption, except beverage containers, plates and packets and wrappers containing food;
8. Beverage containers made of expanded polystyrene, including their caps and lids;
9. Cups for beverages made of expanded polystyrene, including their covers and lids.

A market restriction has already been implemented in Scotland in respect of plastic-stemmed cotton buds, in keeping with the requirements of the Directive. The Scottish Government is committed to placing market restrictions on other single-use plastics items and on all oxo-degradable products identified in Article of the SUP Directive and intends to introduce the required Regulations in 2021. This would mean that, from this date, businesses will not be permitted to supply these items to end users (customers) in Scotland, irrespective of whether those businesses intend to charge for those items or not. The supply restriction would apply regardless of the channel of distribution (whether physical or online). Through this consultation, the introduction of restriction on the supply of these items where the supply is not in the course of a commercial activity (for example, the supply by individuals in a personal capacity) and on manufacture of these items is also being considered.

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<sup>14</sup> European Union (1990) [Council Directive 90/385/EEC of 20 June 1990 on the approximation of the laws of the Member States relating to active implantable medical devices](https://eur-lex.europa.eu/) [Online]. Available at: <https://eur-lex.europa.eu/>

<sup>15</sup> European Union (1993) [Council Directive 93/42/EEC of 14 June 1993 concerning medical devices](https://eur-lex.europa.eu/) [Online]. Available at: <https://eur-lex.europa.eu/>

The proposed market restrictions are intended to significantly reduce plastic beach litter, with the items in question being amongst those most commonly found on beaches throughout the European Union. As ocean currents are not constrained by national boundaries, the measures being taken in Scotland will not only assist in reducing plastic pollution domestically but also mitigate Scotland's contribution to plastic pollution in other jurisdictions and the global plastics crisis generally.

The proposed market restrictions will also stimulate a shift towards less harmful alternatives such as paper and cardboard products, which are readily available in the domestic marketplace. Demonstrating this more responsible choice of resources is a vital element in building a more sustainable, circular Scotland with natural resources, health and beauty less encumbered by plastic pollution.

## 2.2 Scotland's Response

Scottish Ministers having long recognised the need to reduce consumption of single-use items, address sources of marine litter and move towards a more circular economy. Specific measures targeting single-use plastic items which have already been implemented, or are presently subject to consultation by the Scottish Government include:

- Market restrictions on plastic microbeads and plastic-stemmed cotton buds which came into force 19 June 2018<sup>16</sup> and 12 October 2019<sup>17</sup> respectively;
- A 5p-levy on single-use carrier bags, with work underway to increase the charge to 10p;
- The establishment of a deposit return scheme for drinks containers including PET plastic bottles by 1 July 2022, with a 90% collection target by 2025<sup>18</sup>;
- The establishment of the Expert Panel on Environmental Charges and Other Measures (EPECOM)<sup>19</sup> in May 2018 to explore measures to reduce the environmental impacts of on-the-go consumption in Scotland. The group published two reports: Recommendations on single-use disposable beverage cups<sup>20</sup> in July 2019 and Ending the Throwaway Culture: Five Principles for

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<sup>16</sup> Scottish Government (2018) [The Environmental Protection \(Microbeads\) \(Scotland\) Regulations 2018](https://www.legislation.gov.uk/) [Online]. Available at: <https://www.legislation.gov.uk/>

<sup>17</sup> Scottish Government (2019) [The Environmental Protection \(Cotton Buds\) \(Scotland\) Regulations 2019](https://www.legislation.gov.uk/) [Online]. Available at: <https://www.legislation.gov.uk/>

<sup>18</sup> Scottish Statutory Instruments (2020) [The Deposit and Return Scheme for Scotland Regulations 2020](https://www.legislation.gov.uk/) [Online]. Available at: <https://www.legislation.gov.uk/>

<sup>19</sup> EPECOM (2019) [Expert Panel on Environmental Charges and Other Measures](https://www.gov.scot/) [Online]. Available at: <https://www.gov.scot/>

<sup>20</sup> EPECOM (2019) [Recommendations on single-use disposable beverage cups](https://www.gov.scot/) [Online]. Available at: [https://www.gov.scot](https://www.gov.scot/)

Tackling Single-use Items<sup>21</sup> in September 2020;

- Ongoing work to reform the UK-wide producer responsibility scheme for packaging, with a commitment to consult on detailed proposals in 2021;
- a successful ‘Trial Period’ campaign<sup>22</sup> to promote reusable menstrual products, delivered by Zero Waste Scotland on behalf of the Scottish Government;
- The requirement on businesses, public sector and not-for-profit organisations to present plastic (and other materials) for separate collection as set out under the Waste (Scotland) Regulations 2012<sup>23</sup>;
- Becoming signatory to the New Plastics Economy Global Commitment<sup>24</sup>, led by the Ellen MacArthur Foundation and the UN Environment Programme, demonstrating our commitment to a circular economy for plastics;
- Becoming a founding signatory to the UK Plastics Pact<sup>25</sup>, led by WRAP, a collaborative initiative that seeks to create a circular economy for plastics.

Implementing the requirements under Article 5 will align with the requirements set out in the EU Circular Economy Package (CEP) which came into force in July 2018. The Scottish Government has long recognised the benefits of a circular economy approach as demonstrated through Scotland’s 2016 Circular Economy Strategy ‘Making Things Last’, and many of the Scottish Government’s circular economy targets and policy commitments align with, or go beyond, the requirements of the CEP.

By reducing the amount of single-use plastics entering the Scottish market and by extension, the environment, the proposed market restrictions will support the targets, ambitions and actions set out in: Towards a Litter Free Scotland: A strategic Approach to Higher Quality Local Environments (TLFS)<sup>26</sup>, A Marine Litter Strategy for Scotland (MLSS)<sup>27</sup> and Protecting Scotland, Renewing Scotland: the Government’s Programme

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<sup>21</sup> EPECOM (2020) Ending the Throwaway Culture: Five Principles for Tackling Single-use Items [Online]. Available at: <https://www.gov.scot/>

<sup>22</sup> Zero Waste Scotland (2020) Trial Period Campaign [Online]. Available at: <https://www.trialperiod.scot/>

<sup>23</sup> Scottish Statutory Instruments (2012) The Waste (Scotland) Regulations 2012 [Online]. Available at: <https://www.legislation.gov.uk/>

<sup>24</sup> Ellen MacArthur Foundation (2020) New Plastics Economy Global Commitment: Commitments, Vision and Definitions [Online]. Available at: [www.newplasticseconomy.org](http://www.newplasticseconomy.org)

<sup>25</sup> WRAP (2018) The UK Plastics Pact [Online]. Available at: [wrap.org.uk/](http://wrap.org.uk/)

<sup>26</sup> The Scottish Government (2014) Towards a Litter Free Scotland: A strategic Approach to Higher Quality Local Environments [Online]. Available at: <https://www.gov.scot/>

<sup>27</sup> The Scottish government (2014) A Marine Litter Strategy for Scotland [Online]. Available at: [https://www.gov.scot](https://www.gov.scot/)

for Scotland 2020-2021<sup>28</sup>. By shifting productions of single-use items towards non-plastic materials, it will also result in net carbon savings, thereby supporting Scotland's 2045 net zero target.

## 2.3 The Development of the Consultation Paper

This Environmental Report has been published as part of a public consultation seeking views on the proposed introduction of market restrictions for the single-use plastic items and oxo-degradable plastic products covered under Article 5 of SUP Directive.

The durability, versatility and widespread use of plastic has facilitated the growth of a throwaway culture in Scotland. However, these same characteristics are what make this material so damaging in the marine, freshwater and terrestrial environments. Plastic represents 20% of all terrestrial litter in Scotland<sup>29</sup>, with about 550 tonnes of land-based plastic litter (representing 110 million pieces) ending up on the seabed around Scotland every year. Typically, 250 tonnes of microplastics enter Scottish seas each year (about 25 trillion pieces), 90% of which enters the ocean via Scottish rivers.<sup>30</sup>

The intention set out in the consultation paper is that the imposing of restrictions on specified single-use plastic items and oxo-degradable plastic products will strengthen efforts to reduce marine litter, avoid the pollution of ecosystems and further support and stimulate the drive to a net-zero carbon Scottish society. They will play an important role in moving towards a more sustainable, circular economy in Scotland, with greater resource efficiency and respect for natural assets.

## 2.4 Consideration of Reasonable Alternatives

The 2005 Act requires that the potential significant environmental effects associated with reasonable alternatives to the targeted single-use plastic and oxo-degradable plastic products are assessed as part of the SEA process.

SEA Guidance explains that alternatives must be realistic and that when considering whether an alternative is reasonable, potential restrictions to its implementation, such as parameters set relevant legalisation and any relevant policy commitments, for example, are fully considered.

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<sup>28</sup> The Scottish Government (2020) [Protecting Scotland, Renewing Scotland: The Government's Programme for Scotland 2020-2021](https://www.gov.scot/) [Online]. Available at: <https://www.gov.scot/>

<sup>29</sup> Zero Waste Scotland (2013) [Scotland's Litter Problem; Quantifying the Scale and Cost of Litter and Flytipping](http://www.zerowastescotland.org.uk) [Online]. Available at: [www.zerowastescotland.org.uk](http://www.zerowastescotland.org.uk)

<sup>30</sup> The Scottish Government (2020) [How Much Plastic Enters Scottish Seas and Where Does it Come From?](https://www.gov.scot/) [Online]. Available at: [www.gov.scot](https://www.gov.scot/)

As noted above, Article 5 of the EU Single Use Plastics Directive requires the introduction of market restrictions for a specified list of problematic single use plastic items and all oxo-degradable products. If Scotland is to meet standards set out by the EU, these items must be included within the scope of proposed measures.

Whilst the focus of the proposed measures is on items covered by the EU Single Use Plastics Directive, we recognise that Scotland's beaches are blighted by some items not specified in the Directive. It is the Scottish Government's intention to explore further market restrictions on a wider range of items in due course, as set out in the consultation.

The proposed introduction of market restrictions form part of a wider package of measures being taken forward by Scottish Ministers to address marine litter and support a shift away from our throwaway culture, and sit alongside a broader range of initiatives already established or underway, such as market restrictions on plastic microbeads and plastic stemmed-cotton buds. Our approach is underpinned by the work of the Expert Panel on Environmental Charges and Other Measures (EPECOM) whose second report looks at the issue of single-use in a holistic way. The Scottish Government is committed to implementing the other requirements of the SUP Directive and has set out in the existing actions and next steps that will help create a more circular plastics economy in Scotland.

The Scottish Government also understands the problems caused by single-use items cannot be solved entirely by replacing them with alternative single-use items made with different materials. While the focus is on the items listed in the SUP Directive, the Scottish Government wishes to see innovative solutions that support more sustainable business models and reusable alternatives prioritised over substitution of materials.

The Scottish Government intends to track, report and review the impacts of measures and assess what more needs to be done to address our throwaway culture.

We consider that other measures are complementary to or would exceed the proposed market restrictions required by the EU Single Use Plastics Directive and, therefore, they are not considered reasonable alternatives. Further detail is set out in Appendix A.

The Scottish Government, as the Responsible Authority, proposes adopting an analytical approach to the assessment whereby predicted impacts of substitute products are investigated in relation to the specific single-use plastic item that each could theoretically replace.

For each of the restricted single-use plastic items, market research was conducted to identify the most common and likely product alternative (see **Table 2-1** below). Each alternative has been assessed in turn in order to identify, describe and evaluate (where possible) the likely significant environmental effects that could arise from its implementation.

Our impact analysis assumes that target items removed from the market are displaced by an equal number of alternative single-use items. It is possible however, that some items may be prevented through avoided consumption or reuse, which would result in greater environmental benefits. The extent of reuse and avoided consumption will depend in large part on supporting measures put in place.

As previously noted, one of the aims of aligning with Article 5 of the SUP Directive is to reduce the amount of plastic waste leakage both within and out with the Scottish ecosystem. To that end, the alternative products identified avoid the inclusion of plastic elements where possible, are generally constructed of materials which have a reduced impact on marine environments and biodiversity, and which will likely have shorter degradation periods. These considerations and others are noted within the analysis.

The effects of all alternative options have been considered with respect to the following topics: Material Impacts; Climate Factors, Landscape and Visual Impacts; Biodiversity. Based on the findings contained within the initial scoping report and after statutory consultation, these topics are deemed to be significant within the context of EU SUP Directive Article 5.

**Table 2-1 Average weight of single-use plastic items used in the analysis. Data sources: EU<sup>31</sup>, DEFRA<sup>32</sup>, and other<sup>33</sup> studies.**

Measure No	Item	Functional unit	Average weight (g)
1	Plastics cutlery	1 spoon	2.6
	Wooden Cutlery	1 spoon	3
2	Plastics plates	1 plate	9.98
	Paper Plates	1 plate	19
3	Plastic beverage stirrer	1 stirrer	0.6
	Wooden Stirrer	1 stirrer	1.9
4	Plastic straws	1 straw	0.55
	Wax-line paper straws	1 straw	1.07
5	Plastic balloon sticks	1 balloon stick	4.81
	Cardboard balloon sticks	1 balloon stick	9.62

<sup>31</sup> European Union (2018) Life Cycle Inventories of Single Use Plastic Products and their Alternatives [Online]. Available at: <https://ec.europa.eu/>

<sup>32</sup> DEFRA (2018) Consultation Stage Impact Assessment on the proposal to ban the distribution and/or sale and of plastic drinking straws in England [Online]. Available at: <https://consult.defra.gov.uk/>

<sup>33</sup> Assumptions made on oxo-biodegradable and conventional bags are based on a study for Interek by Edwards and Parker (2012): A Life Cycle Assessment of Oxo-biodegradable, Compostable and Conventional Bags [Online] Available at: <http://www.biodeg.org/>

6	Food containers made of expanded polystyrene	1 container	5
	Paperboard + wax box	1 container	10
7	Cups made of expanded polystyrene	1 cup	2.7
	Plastic-line paper cups	1 cup	11
8	Oxo-degradable HDPE	19.1 litre carrier bag <sup>34</sup>	8.17
	Conventional HDPE	19.1 litre carrier bag	8.17

### 3. The Approach to the Assessment

**This section outlines the approach to the assessment and then summarises the process undertaken to produce this SEA. The assessment has adopted a single tier approach to explore the potential for significant environmental effects within the SEA scoped-in topics.**

**Answering the assessment questions should enable key issues associated with the Scottish Government’s proposal to introduce market restrictions on single-use plastic items to be explored in relation to the environmental topic areas and the relevant environmental objectives (e.g. contributions to emissions reduction targets). The assessment should be able to focus on the key issues and potential effects, ensuring these are framed in the context of current obligations.**

#### 3.1 The SEA Process to Date

SEA has a number of distinct stages: screening, scoping, the environmental assessment and the production of an Environmental Report, and the publication of a Post-Adoption Statement. At each stage, there is a requirement to consult with three statutory Consultation Authorities. These are Historic Environment Scotland (HES), NatureScot and the Scottish Environment Protection Agency (SEPA).

The first stage of SEA leads to the production of a Scoping Report. This sets out the proposed scope and approach to assessing the potential environmental effects. The SEA Scoping Report for the introduction of Scottish market restrictions on single-use and oxo-degradable plastic items was issued for consultation for a four-week period concluding on 21 September 2020. Three responses to the consultation were received from the statutory consultees, which resulted in amendments to the proposed scope and approach to assessment (a schedule of consultation responses to the Scoping Report is contained at Appendix A).

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<sup>34</sup> When we investigated the impact of oxo-degradable plastics on soil, we’ve taken into consideration the widespread use of oxo-degradable plastic as agricultural mulch films.

The proposed introduction of market restrictions on specified single-use plastic products in Scotland has been subject to assessment using the amended approach. The findings of these assessments are presented in this SEA Environmental Report.

The introduction of market restrictions will be consulted on alongside the SEA Environmental Report. Following that consultation, the Scottish Government will review and analyse the responses received on this Environmental Report as well as other published impact assessments and the content of the consultation paper.

Upon the introduction of market restrictions on single-use plastic items, the Scottish Government will publish a Post Adoption Statement (PAS). This Statement will reflect on the findings of the SEA assessment and the views expressed in the consultation, and outline how the issues raised have been considered in the finalisation of the policy measure. Scottish Government will monitor the implementation and environmental effects resulting from the placing of restrictions on single-use plastic items on the Scottish market.

## 3.2 Scope of the Assessment (Overview, Scoping Consultation, Current Scope)

### 3.2.1 Overview

The aim of the SEA is to identify, describe and evaluate the likely significant environmental effects of introducing market restrictions on specified single-use plastic items and oxo-degradable plastic products.

The 2005 Act requires that the assessment includes information on the *“likely significant effects on the environment, including on issues such as: biodiversity; population; human health; fauna; flora; soil; water; air; climatic factors; material assets; cultural heritage, including architectural and archaeological heritage; landscape; and the inter-relationship between the issues referred to”*.

Consideration has been given the relevant contextual information, together with the attributes of Article 5 of the SUP Directive, to define the scope of the assessment.

### 3.2.2 Scoping Consultation

Consultation with the statutory consultees was undertaken on the proposed scope of the SEA for a 35-day period concluding 25 September 2020. Each consultee was provided with the *Introducing Market Restrictions on Single-Use Plastic Items in Scotland SEA Screening and Scoping Report*. Consultation responses were received from all three statutory consultees.

The consultees all welcomed the commission of the SEA for the implementation of Article 5 of the SUP Directive and provided comments on:

- the scope of the assessment and the corresponding topics to be included in the assessment;
- the proposed methodological approach to the assessment;

- suggested approaches to the consideration of alternative materials and alternative strategic approaches.

The full list of comments and response are provided as Appendix A.

### 3.2.3 Current Scope

In **Table 3-1**, each of the 10 SEA topic areas is considered in isolation with a justification for whether each topic is scoped in, or scoped out, of this SEA provided. The overall rationale for scoping topics in, or out, has been derived from the Screening and Scoping Report and also reflects the consultation responses from the Consultative Authorities (as detailed in Appendix A).

**Table 3-1 SEA topics scoping and justification**

SEA Topic Area	Scoped in	Justification
Biodiversity, Flora and Fauna	Yes	A driving objective of the restriction on single-use plastic items is reducing single-use plastic pollution and litter in both terrestrial and marine environments of Scotland, The end goal of this objective is to protect, improve and assure the continued prosperity of the flora and fauna of Scotland. By restricting the supply of certain single-use plastic products, plastic waste levels are expected to decrease, with an attendant decrease in harmful microplastics, that are known to leak into the environment, causing significant harm to the wildlife and flora of Scotland. For this reason, it was considered necessary to scope biodiversity into the Environmental Assessment. This decision was welcomed and reiterated by statutory consultees.
Population	No	This environmental assessment is predicated on the assumption that introducing market restrictions on problematic single-use plastics items will result in a behavioural shift in consumption patterns this will have resultant positive effects in other assessment topics e.g. increased recycling as explored under material assets and reduced marine and terrestrial littering of in scope single-use plastic items as described under landscape and visual impacts. As the likely consequences of the anticipated shift in behaviour are considered under other topics, population as a topic area has been scoped out of this environmental assessment.
Human Health	No	Single-use items, either made of plastic or another alternative material, are not deemed to cause any harm to human health. Therefore, we do not expect the introduction of market restrictions on the proposed single-use plastic items to cause any significant

		effects on human health which has subsequently scoped out from this SEA.
Soil	Yes	Single-use plastic items, and specifically those oxo-degradable products used within the context of agriculture, are designed to degrade in situ. Owing to this, there is the potential for microplastics produced by the breakdown of this material to have an impact on soil quality as they leak into that soil, decreasing its purity and subsequent utility as a growing medium and habitat. With the proposed market restrictions, the extent to which such materials leak into the soil will be significantly curtailed, with a resultant improvement to the overall purity and quality of soil in Scotland.
Water	No	The single-use plastic items in scope could contribute to the presence of microplastics in waterways. The potential hazards associated with microplastics come in three forms: physical particles, chemicals, and microbial pathogens as part of biofilms. According to a review study by the World Health Organisation <sup>35</sup> , chemicals and biofilms associated with microplastics in drinking-water pose a low concern for human health and hence water is scoped out. On the other hand, overarching consensus exists on the significant harm that could be caused due to physical plastic particles on marine and terrestrial species. This particular point has been covered under the biodiversity topic area; an approach that has been adopted in Strategic Environmental Assessment reports published in Scotland.
Air	No	The introduction of market restrictions on the proposed single-use plastic items do not require changes to the way waste is currently collected and managed. This means that waste collection services in terms of both type and frequency will not change due to these measures. Thus, we do not expect any significant effects on air quality which has subsequently scoped out from this SEA.
Climatic Factors	Yes	The key objective of the introducing market restrictions on problematic single-use items is to eliminate fossil-based plastic and support the switch to low-carbon alternatives. Therefore, the adoption of proposed market restrictions will enable us to reduce greenhouse gases and tackle climate change. In consequence, climatic factors is scoped into this SEA.

<sup>35</sup> World Health Organisation (2019) [Microplastics in drinking-water](http://www.who.int) [Online]. Available at: [www.who.int](http://www.who.int)

Material Assets	Yes	The introduction of market restrictions on the proposed single-use plastic items will lead to a switch from lightweight single-use plastic items to other non-plastic alternatives which are generally heavier (e.g. wood, paper). This will ultimately have an impact on the amount of waste generated and the corresponding infrastructure used in the recycling process. As such, introducing market restrictions on single-use plastics items is expected to have significant impacts related to material assets which is scoped into this SEA.
Cultural Heritage and the Historic Environment	No	The introduction of market restrictions on the proposed single-use plastic items do not require additional infrastructure to be built or changes to the way waste is currently collected and managed. Therefore, we do not expect these measures to have significant effect on cultural heritage and the historic environment which has subsequently scoped out from this SEA.
Landscape and Visual Impacts	Yes	A main objective of the proposed market restrictions is to reduce single-use plastic pollution and litter in both terrestrial and marine environments of Scotland. As such the proposed market restrictions will have a material impact on the volume of such waste found within Scotland, and the extent to which long-lasting plastic litter pollutes the Scotland's scenery. It is also likely that any replacement products that come to prevalence after the restriction may have less-damaging characteristics i.e. a shorter degradation period than plastic waste, which again would impact the Scottish landscape and its beauty significantly.

In summary, pursuant to the consideration of the introduction of the proposed market restrictions and the associated likely significant environmental effects, the following topic areas have been scoped into this SEA: Biodiversity, Flora and Fauna, Climatic Factors, Material Assets, Soil and Landscape and Visual Impacts. Furthermore, the assessment has given consideration to other potential associated impacts on topic areas from the introduction of market restrictions which are summarised in the cumulative effects section (Section 8).

### 3.3 Context of the Assessment (Review of Plans and Programmes, Review of Environmental Baseline)

#### 3.3.1 Review of Plans and Programmes

The 2005 Act requires a report containing “*an outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes*” (Schedule 3(1)) as well as “*The environmental protection objectives, established at international (European) Community or Member State level, which are relevant to the*

*plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation” (Schedule 3(5)).*

A fundamental initial step in undertaking the SEA is to identify and review other relevant plans, programmes and strategies (PPS) which could influence the proposed plan. These may be PPS at an international/European, national, regional or local level, commensurate with the scope of introducing market restrictions on the specified single-use plastic items. The review aims to identify relationships between the implementation of Article 5 and the other PPS i.e. how the introduction of market restrictions could be affected by the aims, objectives and/or targets of other plans and programmes or how it could contribute to the achievement of the environmental and sustainability objectives of other PPS. Furthermore, the review of other PPS is also a useful source of information to support the completion of the environmental baseline analysis used to determine the key concerns relevant to introducing market restrictions.

For each of the topic areas scoped into this SEA (and the ensuing topic sections), the SEA provides a review and summary of PPS relevant to the introduction of market restrictions on single-use plastic items in Scotland.

### 3.3.2 Review of Environmental Baseline

The 2005 Act requires a report containing “*The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme*” (Schedule 3(2)), “*The environmental characteristics of areas likely to be significantly affected*” (Schedule 3(3)), and “*Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds and Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna (as last amended by Council Directive 97/62/EC)*” (Schedule 3(4)).

In each SEA topic section outlined in this assessment, an environmental baseline is provided of the existing receptors which will be impacted by the introduction of market restrictions on single-use and oxo-degradable plastics. The environmental baseline provides information against key metrics in relation to introducing market restrictions on single-use plastic items, such as weight, consumption and carbon impacts (see **Table 3-2**)

**Table 3-2 Environmental baseline metric.**

<b>Number of single-use plastic items in scope</b>	777 million
<b>Weight of single-use plastic items</b>	2,000 tonnes
<b>Whole-life carbon impacts</b>	10,550 tonnes CO <sub>2</sub> eq.
<b>Percentage of single-use plastic items littered in Scotland</b>	~ 4.5%

The evolution of this environmental baseline is taken from the ‘do nothing’ option with the introduction of market restrictions on single-use plastic items being assessed against ‘do nothing’ as a baseline to determine the impact, positive or negative, that proposed market restrictions may provide.

### 3.4 Significant Environmental Effects

The assessment adopts a single tier approach to consider significant effects associated with the introduction of market restrictions in relation to each of the five SEA topics identified.

The assessment questions have therefore been developed to ensure that the SEA focuses on the significant environmental impacts relevant to each scoped in topic area.

The questions are presented in **Table 3-3** below.

**Table 3-3 SEA assessment questions**

SEA Topic Area	Question
Biodiversity, Flora and Fauna	<p>Will it protect and/or enhance designated nature conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?</p> <p>Will it support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions?</p> <p>Will it help avoid pollution of the terrestrial, coastal and marine environments?</p>
Climatic Factors	<p>Will the alternative option contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland?</p>
Material Assets	<p>Will it contribute towards achieving Scotland’s waste targets?</p> <p>Will it increase the economic value and utility of affected materials?</p> <p>Will it reduce ‘leakage’ of material to landfill or energy recovery or as litter?</p>
Soil	<p>Will the proposal contribute to reducing levels of soil contamination?</p>

Landscape and Visual Impacts	Will the alternative option reduce the visual effects from littering of materials into terrestrial and marine environments and improve their scenic qualities?
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### 3.5 Undertaking the Assessment

The activities associated with implementing market restrictions on single-use plastic items have been analysed to identify and evaluate (where applicable) the likely significant effects that could arise – the following key considerations have been used to inform the assessment:

- consultation with the consultative authorities (SEPA, NatureScot and Historic Environment Scotland) and other relevant stakeholders;
- all relevant contextual information including a review of associated PPS, the regulatory framework and the environmental baseline;
- the nature of the potential effect (what is expected to happen);
- the timing and duration of the potential effect (e.g. short, medium or long term);
- the geographic scale of the potential effect (e.g. local, regional, national);
- the location of the potential effect (e.g. whether it affects rural or urban communities);
- the potential effect on vulnerable communities or sensitive habitats (e.g. terrestrial or marine);
- the reasons for whether the effect is considered significant;
- the reasons for any uncertainty, where this is identified; and
- the potential to avoid, minimise, reduce, mitigate or compensate for the identified effect(s) with evidence (where applicable).

Where the baseline data has been slight, uncertain or incomprehensive, the best available information together with professional assumptions and judgement has been utilised to assess the anticipated significant effects of introducing market restrictions.

### 3.6 Assessment of Secondary, Cumulative and Synergistic Effects

Schedule 3 (6) (e) of the Environmental Assessment (Scotland) Act 2005 requires that the “*secondary, cumulative and synergistic effects*” of introducing market restrictions on single-use plastic items and oxo-degradable plastic products are assessed. Using a single tier approach, this assessment will deliver a summary of all the effects associated

with establishing market restrictions on single-use plastic items together with the in-combination effects with other plans and programmes.

In terms of the overall assessment of the cumulative effects, it should be noted that accurately assessing the impact of market restrictions is challenging due to the uncertainties around the variety of alternatives to single-use plastic items in scope, the level of uptake by citizens, and the predicted shift from single-use plastic items to multi-use options.

### 3.7 Mitigation and Monitoring Proposals

The identification of effective mitigation measures is a fundamental element of the SEA process and, where significant adverse effects have been identified, appropriate mitigation measures have been proposed. The aim of such mitigation measures is to ensure that the replacement of single-use plastic items by non-plastic alternatives is carried out as efficiently as possible, and with greatest respect paid to the reuse and secondary applications of such products.

Putting appropriate measures in place, such as those specified within the relevant sections, may assist in optimising carbon savings and realising greater reductions in waste and litter generation. Mitigation and enhancement measures have been identified for each of the topic areas scoped into the assessment where possible. In some instances, mitigation measures are also proposed for minor negative effects, with corresponding enhancement measures also recommended where appropriate.

In order to ensure that the aims and objectives of placing market restrictions on certain single-use plastic items in Scotland are realised, proposals for the development of a monitoring protocol have been recommended in Section 10.2

It is also anticipated that further information on the development of monitoring protocols associated with the proposed market restrictions will be set out in the Post Adoption Statement.

### 3.8 Summary and Overview of Difficulties Encountered

This SEA has focussed on the overall assessment of the introduction of market restrictions on specified single-use plastic items and oxo-degradable plastic products in Scotland. The environmental assessment centres on comparing the anticipated effects, both positive and negative, against the 'do nothing' option which is retaining the current stance of no market restrictions.

The main difficulties encountered in undertaking this environmental assessment are summarised below:

- **Data limitations:** The overall obtainability of inclusive and accurate baseline data for Scotland has been limited. Where the baseline data has been slight, uncertain or incomprehensive, the best available information together with professional assumptions and judgement has been utilised to assess the anticipated effects of introducing market restrictions.
- **Market research:** Limited research was obtained relating to the quantity of products placed on the market in Scotland for each of the items in scope of this research. Estimates for Scotland were compiled through a market research assessment exercise which utilised a two-stage approach:
  1. A review of EU, English, and Welsh data on single-use plastics and methodologies used; and
  2. Stakeholder engagement to gather relevant stats and evidence on the amount of single-use plastic items sold in Scotland.

Although the market research assessment exercise highlighted a degree of uncertainty in existing methodologies and reported estimates, the bottom-up assessment approach, coupled with insights and feedback from stakeholders, has allowed us to conclude the best available estimates using all secondary data available.

## 4. Climatic Factors

**For the purposes of this assessment, the term is concerned with increasing the likelihood of climate change effects through greenhouse gas emissions, and the ability to adapt to the effects of climate change such as the occurrence of more extreme weather events.**

**The Carbon Impacts of the Circular Economy (2015)<sup>36</sup> states that over two thirds of Scotland's' carbon footprint is directly related to material consumption and waste. Although the amount of single-use plastics targeted in this proposed strategy is relatively low, the proposed measure is expected to achieve carbon savings as it encourages the shift from high-carbon fossil fuel material (i.e., plastics) to low-carbon material (e.g. paper, cardboard, or wood).**

**This section provides the contextual information to inform the assessment (in terms of the review of Plans, Programmes and Strategies (PPS) and the baseline information) as well as an assessment of the effects of the SUP Directive on climate change.**

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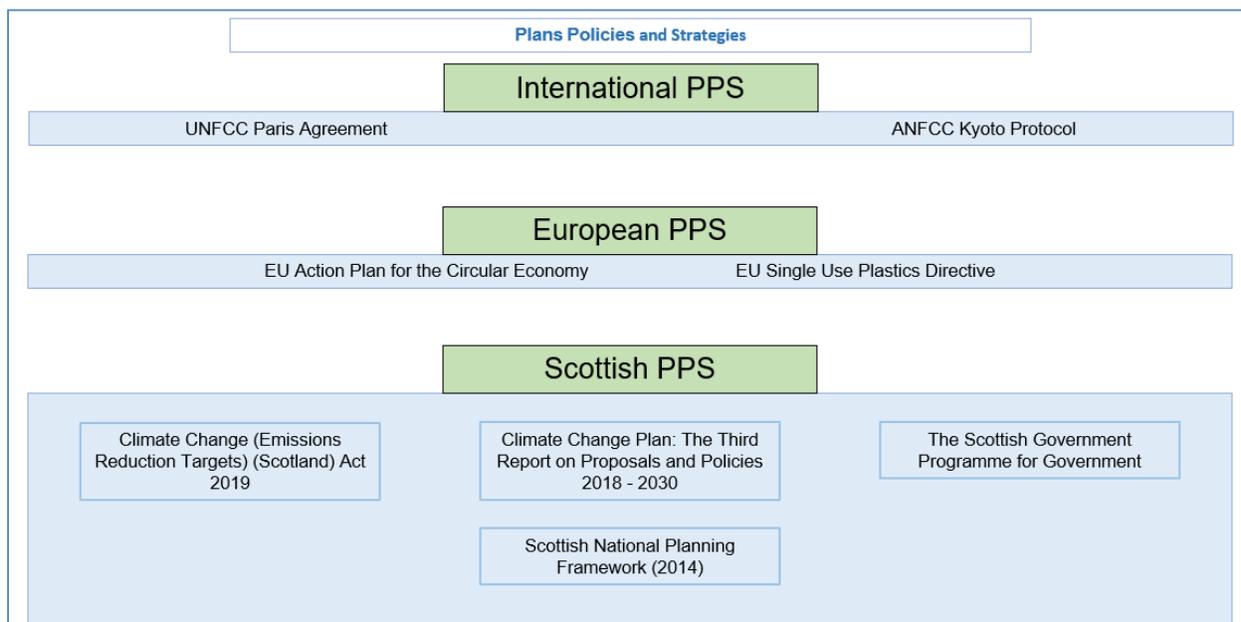
<sup>36</sup> Zero Waste Scotland (2015) [The Carbon Impacts of the Circular Economy Technical Report](http://www.zerowastescotland.org.uk) [Online]. Available at: [www.zerowastescotland.org.uk](http://www.zerowastescotland.org.uk)

## 4.1 Relationship with other Plans, Programmes and Strategies and Environmental Objectives

The PPS that are relevant to the climatic change topic area are shown in **Figure 4-1** and summarised thereafter.

For the purposes of the review of the international plans and programmes for this SEA, it is assumed that the broad objectives of extant European Union (EU) legislation will be maintained once the UK has withdrawn from the EU and that similar or equivalent environmental protections will remain in place.

**Figure 4-1 Plans, Policies and Strategies related to climatic factors.**



The relationship between the identified PPSs and the market restriction of specified single-use plastic items are outlined below:

**The United Nations Framework Convention on Climate Change (UNFCCC)** sets an overall framework for international action to tackle the challenges posed by climate change. The Convention sets an ultimate objective of stabilising greenhouse gas concentrations "at a level that would prevent dangerous anthropogenic (human induced) interference with the climate scheme." The Convention requires the development and regular update of greenhouse gas emissions inventories from industrialised countries, with developing countries also being encouraged to carry out inventories. The countries who have ratified the Treaty, known as the Parties to the Convention, agree to take climate change into account in such matters as agriculture, industry, energy, natural resources and where activities involve coastal regions. The Parties also agree to develop national programmes to slow climate change. The two main agreements resulting from the UNFCCC to date are the **Kyoto Protocol (1997)** and the **Paris Agreement (2015)**.

**The Kyoto Protocol** is an international agreement linked to the United Nations Framework Convention on Climate Change (UNFCCC). It was adopted on 11 December 1997 to establish an international mechanism to reduce emissions of greenhouse gas emissions and in consequence set binding emissions reduction targets for 37 industrialised countries and the European Community. These targets equated to an average of 5% reductions relative to 1990 levels over the five-year period 2008-12. The key distinction between this and the UNFCCC is that the Convention encourages nations to stabilise greenhouse gases while the Kyoto Protocol committed them to doing so through greenhouse gas reductions. It included three market-based mechanisms to meet these targets: emissions trading; the clean development mechanism (CDM); and Joint Implementation (JI).

**The Paris Agreement** was adopted by those parties attending COP-21 in December 2015. It was signed by 197 UNFCCC members and at the time of writing has been ratified by 190 of these. Its aim is to keep global temperature rise this century well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C. Additionally, the agreement aims to strengthen the ability of countries to deal with the impacts of climate change. It discusses the importance of limiting emissions from waste management. The introduction of market restrictions would contribute to the limiting and reduction of emissions relating to waste management by stimulating a shift away from emissions intensive single-use plastic manufacture towards reusable, more sustainable and less carbon intensive alternative products.

**European Union (2018): The EU Action Plan for the Circular Economy** details an EU Action Plan for the Circular Economy. The Action Plan includes a suite of programmes seeking to embed improved practices across the lifecycle of products from cradle to grave. The wider benefits of adopting a circular economy contribute to helping tackle climate change and lower current emissions levels. The **revised legislative proposals on waste** set clear targets for waste reductions. Key elements of the revised waste proposal include:

- A common EU target for recycling 65% of municipal waste by 2030;
- A common EU target for recycling 75% of packaging waste by 2030;
- A binding landfill target to reduce landfill to maximum of 10% of municipal waste by 2030;
- A ban on landfilling of separately collected waste; and
- Promotion of economic instruments to discourage landfilling.

The Action Plan strongly advocates a shift away from resource intensive, linear consumption models that are characterised and compounded by the current role of single-use plastic items in propagating a ‘throwaway’ mentality in Scotland and further afield. Restricting such products within Scotland would likely stimulate the development of more sustainable and reusable alternatives, each of which would contribute to the national effort to exceed recycling targets and to decrease emissions resulting from the unnecessary disposal of waste. The Plan also pushes member states to radically

enhance waste management and recycling practices; to design out waste and to design products that can be recycled (if not repaired/remanufactured) at end of life

**European Union (2019): Directive on the Reduction of the Impact of Certain Plastic Products on the Environment** highlights the significant negative environmental, health and economic impact of certain plastic products with a particular focus on single-use plastic items. The Directive builds upon the European Strategy for Plastics in the Circular Economy through a specific legal framework which aims to increase the level of ambition demonstrated through national measures to prevent and reduce litter with specific reference to single-use plastics. Key elements of the enhanced Directive include:

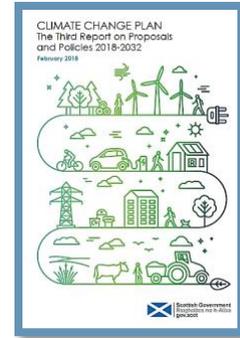
- National measurable quantitative reductions in the production and consumption of single-use plastic products, harmonised technical standards, enhanced product design and differential labelling standards.
- The prioritisation of sustainable renewable non-toxic products and re-use systems/services over single-use plastic items.
- The introduction of Extended Producer Responsibility (EPR) systems which recognise the costs associated with the management and clean up single-use plastic items.

The directive highlights the link between single-use plastic items, plastic litter in terrestrial and aquatic ecosystems and microplastic pollution, and draws attention to the significant negative environmental, health and economic impact of such plastic products and associated deleterious materials. Restricting such materials in Scotland could therefore make a significant reduction in plastic-related carbon emissions and plastic pollution and could save UK municipalities up to £18 million in clean-up costs per annum.

### **Climate Change (Emissions Reduction Targets) (Scotland) Act 2019**

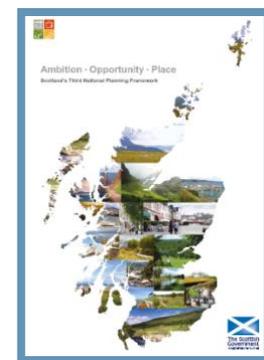
Receiving Royal Assent on 31 October 2019, the Act amends the Climate Change (Scotland) Act 2009 and sets targets for the reduction of greenhouse gases emissions towards a legally binding net-zero carbon target by 2045. This Act represents Scotland's contribution to the worldwide effort to deliver on the Paris Agreement that was reached at the 21st Conference of the Parties of the United Nations Framework Convention on Climate Change.

**Scottish Government (2018): Climate Change Plan - The Third Report on Proposals and Policies 2018-2032** sets out details of the approach to cut emissions up to 2032. It states targets to recycle 70% of all waste by 2025, reduce waste sent to landfill to 5% by 2025, and establish a more circular economy, where goods and materials are kept in use for longer and where the value of resources is preserved and maintained for as long as possible. Single-use plastics and reducing reliance thereon are specifically targeted within the plan.



**Scottish Government (2020-21): The Scottish Government Programme for Government** states the Government's commitment to tackle climate change and to prepare Scotland for the new, low carbon world. The programme commits the government to reducing the demand for and associated impacts of virgin containers, as well as promoting the capture and recycling of existing material. The programme will also commit £500,000 to address litter sinks around the coast and to develop policy which addresses marine plastics. In the context of climate change, the programme seeks to realise carbon benefits by stimulating an increase in recycling rates and a reduction in production-related emissions, as well as a reduction in littering and associated emissions.

**Scottish Government (2014): The Scottish National Planning Framework (NPF) 3** provides the spatial expression of the Scottish Government's Economic Strategy, and the plans for development and investment in infrastructure. The NPF identifies national developments and other strategically important development opportunities in Scotland. The framework recognises that the design of places can minimise waste whilst instilling responsible behaviours by providing waste infrastructure for public use. Planning will play a key role in delivering on the commitments for Scotland to be a low carbon country and the priorities identified in the NPF set a clear direction of travel which is consistent with climate change legislation.



## 4.2 Baseline Characteristics

### 4.2.1 Climate change

Predictions of the effects of climate change have been well documented<sup>37</sup>, and many studies, such as the Handbook of Climate Trends Across Scotland produced by Sniffer<sup>38</sup> show that these effects are already being felt in Scotland. While the extent of the effects of a changing climate is expected to vary by location, there is significant evidence to support the belief that significant changes in precipitation, snowfall, seasonality, cloud cover, humidity, wind speeds, soil moisture, rising sea levels and other extreme weather events may occur<sup>39</sup>.

The significant climate change impacts of material consumption and waste, along with the critical mitigating impact of resource efficient, circular economy policies have been firmly established in academic literature. Zero Waste Scotland's report *The Carbon Impacts of the Circular Economy (2015)*<sup>40</sup> estimates that over two thirds of Scotland's carbon footprint are directly related to material consumption and, to a lesser extent, waste.

### 4.2.2 Carbon emissions

*Scotland's carbon footprint: 1998-2016*<sup>41</sup> provides the latest estimates of greenhouse gas emissions in Scotland for the years 1998 to 2016 and also provides information on the nation's performance against emissions reduction targets set under the Climate Change (Scotland) Act 2009. This publication notes that, in 2016, Scottish source emissions of the basket of greenhouse gases were estimated to be 73.8 million tonnes carbon dioxide equivalent (MtCO<sub>2</sub>eq.).

A report by Zero Waste Scotland estimates that material consumption is responsible for over two thirds of Scotland's carbon emissions<sup>31</sup>. Moreover, the majority of reported carbon impacts occurs overseas in countries where products we buy are produced. The latest Scotland's carbon footprint report<sup>32</sup> reveals that emissions embodied in imported goods and services from overseas accounted for 51.1 per cent of Scotland's carbon footprint in 2016; up from 36.5 per cent in 1998. Therefore, it's important to consider the global climate change impacts of single-use plastics.

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<sup>37</sup> UK Government (2009) [UK Climate Projections \(UKCP09\) \[Online\]](#). Available at: [assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk)

<sup>38</sup> Sniffer (Adaptation Scotland) (2006) [A Handbook of Climate Trends Across Scotland \[Online\]](#). Available at: [www.adaptationscotland.org.uk](http://www.adaptationscotland.org.uk)

<sup>39</sup> IPCC (2014) [Fifth Assessment Report \(AR5\) \[Online\]](#). Available at: [www.ipcc.ch](http://www.ipcc.ch)

<sup>40</sup> Zero Waste Scotland (2015) *The Carbon Impacts of the Circular Economy Technical Report* [Online]. Available at: [www.zerowastescotland.org.uk](http://www.zerowastescotland.org.uk)

<sup>41</sup> Scottish Government (2019) [Scotland's carbon footprint: 1998-2016 \[Online\]](#). Available at: <https://www.gov.scot/>

In the case of plastics, the majority of emissions occur during the production phase. The latest Zero Waste Scotland Carbon Metric report estimates that plastic waste in Scotland in 2018 has a net carbon impact of 667,000 tonnes of CO<sub>2</sub> eq., with 98% of these impacts attributed to the production stage<sup>42</sup>.

### 4.2.3 Likely Evolution of Baseline without the SUP Directive

#### 4.2.3.1 Climate change

Our analysis suggests that single-use plastic items in scope of market restrictions in Scotland do not have significant impacts on climate change. See Section 4.3.2 for detailed analysis on potential global warming impacts associated with single-use plastic items and alternative options.

#### 4.2.3.2 Carbon emissions

Single-use plastics are made primarily from fossil-based material and hence contribute to Scotland's carbon footprint. Nevertheless, our analysis suggests that carbon emissions attributed to the production of single-use plastics are insignificant when compared to other high-carbon waste materials. See Section 4.3.2 for detailed analysis on carbon impacts of single-use plastic items and alternative options.

## 4.3 Consideration of Reasonable Alternatives

### 4.3.1 Methodology

A top-down carbon assessment has been carried out in order to assess the marginal difference in carbon impacts of the 'do nothing' and proposed scenarios. The aim of this analysis is to have a better understanding of the marginal difference in carbon impacts by adopting the proposed measure (such as using wooden cutlery instead of plastic cutlery).

#### **Key sources used in the analysis:**

**Zero Waste Scotland Carbon Metric (2018)** - The Scottish Carbon Metric measures the whole-life carbon impacts of Scotland's waste from resource extraction and manufacturing emissions right through to waste management emissions, regardless of where in the world these impacts occur. Carbon factors for end-of-life activities used in this assessment are based on the Scottish Carbon Metric 2018.

**UK Government conversion factors (2020)** - A carbon dataset, published by the UK Government, that can be used to report on 2019 greenhouse gas emissions by UK based organisations of all sizes, and for international organisations reporting on UK operations. This database is used to obtain carbon factors of materials used in the primary production of investigated items.

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<sup>42</sup> Zero Waste Scotland (2020) The Carbon Footprint of Scotland's Waste: Carbon Metric Technical Report (2017 & 2018) [Online]. Available at: [www.zerowastescotland.org.uk](http://www.zerowastescotland.org.uk)

### Assumptions used in the analysis:

- The carbon impacts of the production of primary materials and end-of-life are considered in this study.
- It's assumed that both targeted and alternative items are disposed by incineration. This aligns with Scotland's forthcoming (2025) landfill ban which will prohibit the landfilling of municipal solid waste containing biodegradable content.
- This assessment assumes all plastic single-use items will be replaced by another single-use alternative. It's highly likely that a proportion of individuals shift to reusable options which will lead to further environmental savings.
- The alternative scenario for each proposed measure is based on the most prominent material that is likely to replace the restricted item.
- The analysis for each scenario is based on specific functional unit and average weight as outlined previously.
- Carbon factors used to quantify emissions associated with the production and disposal of materials are listed below.
- The analysis does not take into account switching single-use plastic items for reusable alternatives as this desirable approach will depend on the introduction of supporting measures and incentives to trigger this behavioural change.

#### 4.3.1.1 Market share

**Table 4.1** provides estimates of single-use plastic items used in Scotland. These estimates are based on a market research assessment exercise utilising a two-stage approach:

1. A review of EU, English, and Welsh data on single-use plastics and methodologies used; and
2. Stakeholder engagement to gather relevant stats and evidence on the amount of single-use plastic items sold in Scotland.

Although the market assessment research exercise has highlighted a degree of uncertainty in *existing* methodologies and reported estimates, the bottom-up assessment approach, coupled with insights and feedback from stakeholders, has allowed us to conclude the best available consumption estimate using secondary data. More importantly, the SEA aims to quantify the marginal impacts of switching single-use plastic items with alternative options. Therefore, any uncertainty around the exact number of single-use plastic items used in Scotland wouldn't change impacts trends – either positive or negative – observed in this analysis.

**Table 4-1 breakdown of total single-use plastic item by type.**

<b>Single-use plastic item in scope</b>	<b>Estimated figures for Scotland Consumption</b>
Balloon sticks	1.7 million
Straws	300 million
Cutlery	276 million
Stirrers	9.9 million
Plates (inc trays and bowls)	50 million
EPS/XPS food containers	66 million
EPS/XPS drinks containers	45 million
Oxo-degradable plastic items	Uncertain but very small market share. For the purpose of this assessment, we assume one oxo-degradable plastic item is discarded by every household in Scotland in a month (total estimate 28.5 million)

Single-use plastic waste generated in Scotland is estimated by multiplying the number of items by average weight factors (Table 4-2 average weight of single-use items used in the analysis. Data sources: EU , DEFRA , and other studies.). Results, summarised in Table 4-3, show that market restrictions on single-use plastic items in scope would increase tonnages of waste generated by nearly 70% (i.e. an increase of 1440 tonnes). Further analysis of the impact of this tonnage increase on Scotland’s waste reduction targets is provided in Section 5 (Material Assets).

**Table 4-2 average weight of single-use items used in the analysis. Data sources: EU<sup>43</sup> , DEFRA<sup>44</sup> , and other<sup>45</sup> studies.**

Measure No	Item	Functional unit	Average weight (g)
1	Plastics cutlery	1 spoon	2.6
	Wooden Cutlery	1 spoon	3
2	Plastics plates	1 plate	9.98
	Paper Plates	1 plate	19
3	Plastic beverage stirrer	1 stirrer	0.6
	Wooden Stirrer	1 stirrer	1.9
4	Plastic straws	1 straw	0.55
	Wax-line paper straws	1 straw	1.07
5	Plastic balloon sticks	1 balloon stick	4.81
	Cardboard balloon sticks	1 balloon stick	9.62
6	Food containers made of expanded polystyrene	1 container	5
	Paperboard + wax box	1 container	10
7	Cups made of expanded polystyrene	1 cup	2.7
	Plastic-coated paper cups	1 cup	11
8	Oxo-biodegradable HDPE	19.1 litre carrier bag <sup>46</sup>	8.17
	Conventional HDPE	19.1 litre carrier bag	8.17

<sup>43</sup> European Union (2018) Life Cycle Inventories of Single Use Plastic Products and their Alternatives [Online]. Available at: <https://ec.europa.eu/>

<sup>44</sup> DEFRA (2018) Consultation Stage Impact Assessment on the proposal to ban the distribution and/or sale and of plastic drinking straws in England [Online]. Available at: <https://consult.defra.gov.uk/>

<sup>45</sup> Assumptions made on oxo-biodegradable and conventional bags are based on a study for Interek by Edwards and Parker (2012): A Life Cycle Assessment of Oxo-biodegradable, Compostable and Conventional Bags [Online] Available at: <http://www.biodeg.org/>

<sup>46</sup> When we investigated the impact of oxo-degradable plastics on soil, we've taken into consideration the widespread use of oxo-degradable plastic as agricultural mulch films.

**Table 4-3 Total amount of single-use items (tonnes) generated in Scotland.**

<b>Measure No</b>	<b>Scope</b>	<b>Business-as-usual (tonnes)</b>	<b>Alternative options (tonnes)</b>	<b>Difference (tonnes)</b>	<b>Change (%)</b>
1	Cutlery	720	830	110	15%
2	Plates	500	950	450	90%
3	Beverage Stirrer	10	20	10	100%
4	Straws	170	320	150	88%
5	Balloon sticks	10	20	10	100%
6	Food containers made of expanded polystyrene	330	660	330	100%
7	Cups and beverage containers made of expanded polystyrene	120	500	380	317%
8	Oxo-biodegradable HDPE	230	230	-	0%
<b>Total</b>		<b>2,090</b>	<b>3,530</b>	<b>1,440</b>	<b>69%</b>

#### 4.3.1.2 Carbon factors (production stage)

**Table 4-4 Carbon factors used in the assessment model (product stage).**

Measure No	Part	Item	Carbon factor (kg CO <sub>2</sub> per kg of material)	Source
1	a	Plastics cutlery	3.105	UK Government conversion factors, 2020
	b	Wooden Cutlery	0.313	UK Government conversion factors, 2020
2	a	Plastics plates	3.105	UK Government conversion factors, 2020
	b	Wax-coated Paper Plates	0.919	UK Government conversion factors, 2020
3	a	Plastic beverage stirrer	3.105	UK Government conversion factors, 2020
	b	Wooden Stirrer	0.313	UK Government conversion factors, 2020
4	a	Plastic straws	3.105	UK Government conversion factors, 2020
	b	Wax-line paper straws	0.919	UK Government conversion factors, 2020
5	a	Plastic balloon sticks	3.105	UK Government conversion factors, 2020
	b	Cardboard balloon sticks	0.919	UK Government conversion factors, 2020
6	a	Food containers made of expanded polystyrene	3.778	UK Government conversion factors, 2020
	b	Wax-coated cardboard boxes	0.919	UK Government conversion factors, 2020
7 <sup>47</sup>	a	Cups and beverage containers made of expanded polystyrene	3.778	UK Government conversion factors, 2020
	b	Plastic-coated paper cups	0.919	UK Government conversion factors, 2020
8	a	Oxo-degradable HDPE	See main document <sup>48</sup>	Edwards C & Parker G. 2012
	b	Conventional HDPE	See above	Edwards C & Parker G. 2012

<sup>47</sup> This category covers both item 8 and 9 listed in part B of the Directive's Annex: Beverage containers made of expanded polystyrene, including their caps and lids, and Cups for beverages made of expanded polystyrene, including their covers and lids.

<sup>48</sup> Intertek (2012) A Life Cycle Assessment of Oxo-biodegradable, Compostable and Conventional Bags [Online]. Available at: <http://www.biodeg.org/>

#### 4.3.1.3 Carbon factors (end-of-life: incineration)

**Table 4-5 carbon factors used in the assessment model (end-of-life: incineration).**

Measure No	Part	Item	Carbon factor (kg CO <sub>2</sub> per kg of material)	Source
1	a	Plastics cutlery	1.824	Zero Waste Scotland Carbon Metric, 2018
	b	Wooden Cutlery	-0.118	Zero Waste Scotland Carbon Metric, 2018
2	a	Plastics plates	1.824	Zero Waste Scotland Carbon Metric, 2018
	b	Wax-coated Paper Plates	-0.118	Zero Waste Scotland Carbon Metric, 2018
3	a	Plastic beverage stirrer	1.824	Zero Waste Scotland Carbon Metric, 2018
	b	Wooden Stirrer	-0.180	Zero Waste Scotland Carbon Metric, 2018
4	a	Plastic straws	1.824	Zero Waste Scotland Carbon Metric, 2018
	b	Wax-line paper straws	-0.118	Zero Waste Scotland Carbon Metric, 2018
5	a	Plastic balloon sticks	1.824	Zero Waste Scotland Carbon Metric, 2018
	b	Cardboard balloon sticks	-0.118	Zero Waste Scotland Carbon Metric, 2018
6	a	Food containers made of expanded polystyrene	1.824	Zero Waste Scotland Carbon Metric, 2018
	b	Wax-coated cardboard boxes	-0.118	Zero Waste Scotland Carbon Metric, 2018
7 <sup>49</sup>	a	Cups and beverage containers made of expanded polystyrene	1.824	Zero Waste Scotland Carbon Metric, 2018
	b	Plastic-coated paper cups	-0.118	Zero Waste Scotland Carbon Metric, 2018
8	a	Oxo-degradable HDPE	See main document <sup>50</sup>	Edwards C & Parker G. 2012
	b	Conventional HDPE	See above	Edwards C & Parker G. 2012

<sup>49</sup> This category covers both item 8 and 9 listed in part B of the Directive's Annex: Beverage containers made of expanded polystyrene, including their caps and lids, and Cups for beverages made of expanded polystyrene, including their covers and lids.

<sup>50</sup> Intertek (2012) [A Life Cycle Assessment of Oxo-biodegradable, Compostable and Conventional Bags](http://www.biodeg.org/) [Online]. Available at: <http://www.biodeg.org/>

### 4.3.2 Results

The results of the carbon assessment exercise undertaken as part of this study are summarised in **Table 4-6**. The results show that all alternative items covered in this study are typically heavier than the plastic ones they replace (+69%), but have lower carbon impacts due to the shift from high-carbon fossil-based material (i.e., plastic) to low-carbon material (i.e., wood or paper), a reduction of 59% in carbon impacts.

**Table 4-6 Results of the carbon assessment of single-use plastic items in scope and alternatives.**

Measure No	Part	Item	Waste generated (tonnes)	Carbon impacts (tonne CO <sub>2</sub> eq.)	Waste generated (% change)	Carbon impacts (% change)
1	a	Plastics cutlery	720	3,540	15%	-95%
	b	Wooden Cutlery	830	160		
2	a	Plastics plates	500	2,460	90%	-69%
	b	Paper Plates	950	760		
3	a	Plastic beverage stirrer	10	30	100%	-93%
	b	Wooden Stirrer	20	2		
4	a	Plastic straws	170	810	88%	-68%
	b	Wax-line paper straws	320	260		
5	a	Plastic balloon sticks	10	40	100%	-75%
	b	Cardboard balloon sticks	20	10		
6	a	Food containers made of expanded polystyrene	330	2,140	100%	-51%
	b	Cardboard boxes	660	1,040		
7 <sup>51</sup>	a	Cups made of expanded polystyrene	120	680	317%	100%
	b	Plastic-line paper cups	500	1,360		
8	a	Oxo-biodegradable HDPE	230	850	0%	-9%

<sup>51</sup> This category covers both item 8 and 9 listed in part B of the Directive's Annex: Beverage containers made of expanded polystyrene, including their caps and lids, and Cups for beverages made of expanded polystyrene, including their covers and lids.

	b	Conventional HDPE	230	770		
<b>Total</b>		<b>Business as usual</b>	<b>2,090</b>	<b>10,550</b>		
		<b>Alternative options</b>	<b>3,530</b>	<b>4,362</b>		
		<b>Change (%)</b>	<b>69%</b>	<b>-59%</b>		

A detailed carbon assessment of each alternative measure is provided in tables below.

The key to each assessment score is shown below.

Score Key:	<b>++</b>	<b>+</b>	<b>0</b>	<b>-</b>	<b>--</b>	<b>?</b>
	Significant positive effect	Minor positive effect	No overall effect	Minor negative effect	Significant negative effect	Score uncertain
<p>NB: where more than one symbol is presented in a box it indicates that the SEA has found more than one score for the category. Where the scores are both positive and negative, the boxes are deliberately not coloured (i.e. 'no overall effect'). Where a box is coloured but also contains a "?" this indicates uncertainty over whether the effect could be a minor or significant effect although a professional judgement is expressed in the colour used. A conclusion of uncertainty arises where there is insufficient evidence for expert judgement to conclude an effect.</p>						

<b>Measure No 1</b>											
Material/item to be restricted:	Plastics cutlery										
The alternative option	Wooden Cutlery										
Notes:											
SEA criteria	Score	Commentary									
Will the alternative option contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland?	++	<p>Our analysis shows that the alternative option can reduce the carbon impacts by 95% (i.e., 3,380 t CO<sub>2</sub> eq.) as we are switching from fossil-based plastics to wood alternative.</p> <table border="1"> <caption>Measure no. 1 Cutlery</caption> <thead> <tr> <th>Category</th> <th>Plastics cutlery</th> <th>Wooden Cutlery</th> </tr> </thead> <tbody> <tr> <td>Waste generated (tonnes)</td> <td>720</td> <td>830</td> </tr> <tr> <td>Carbon impacts (tonne CO<sub>2</sub> eq.)</td> <td>3,540</td> <td>160</td> </tr> </tbody> </table>	Category	Plastics cutlery	Wooden Cutlery	Waste generated (tonnes)	720	830	Carbon impacts (tonne CO <sub>2</sub> eq.)	3,540	160
Category	Plastics cutlery	Wooden Cutlery									
Waste generated (tonnes)	720	830									
Carbon impacts (tonne CO <sub>2</sub> eq.)	3,540	160									

<b>Measure No 2</b>											
Material/item to be restricted:	Plastics plates										
The alternative option	Wax-coated Paper Plates										
Notes:											
SEA criteria	Score	Commentary									
Will the alternative option contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland?	<b>++</b>	<p>Our analysis shows that the alternative option can reduce the carbon impacts by 70% (i.e., 1,700 t CO<sub>2</sub> eq.).</p> <table border="1"> <caption>Measure no. 2 Plates</caption> <thead> <tr> <th>Category</th> <th>Plastics plates</th> <th>Paper Plates</th> </tr> </thead> <tbody> <tr> <td>Waste generated (tonnes)</td> <td>500</td> <td>950</td> </tr> <tr> <td>Carbon impacts (tonne CO<sub>2</sub> eq.)</td> <td>2,460</td> <td>760</td> </tr> </tbody> </table>	Category	Plastics plates	Paper Plates	Waste generated (tonnes)	500	950	Carbon impacts (tonne CO <sub>2</sub> eq.)	2,460	760
Category	Plastics plates	Paper Plates									
Waste generated (tonnes)	500	950									
Carbon impacts (tonne CO <sub>2</sub> eq.)	2,460	760									

<b>Measure No 3</b>											
Material/item to be restricted:	Plastic beverage stirrer										
The alternative option	Wooden Stirrer										
Notes:											
SEA criteria	Score	Commentary									
Will the alternative option contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland?	<b>+</b>	<p>Our analysis shows that the alternative option can reduce the carbon impacts by 90% (i.e., 28 t CO<sub>2</sub> eq.).</p> <table border="1"> <caption>Measure no. 3 Beverage Stirrer</caption> <thead> <tr> <th>Category</th> <th>Plastic beverage stirrer</th> <th>Wooden Stirrer</th> </tr> </thead> <tbody> <tr> <td>Waste generated (tonnes)</td> <td>10</td> <td>20</td> </tr> <tr> <td>Carbon impacts (tonne CO<sub>2</sub> eq.)</td> <td>30</td> <td>2</td> </tr> </tbody> </table>	Category	Plastic beverage stirrer	Wooden Stirrer	Waste generated (tonnes)	10	20	Carbon impacts (tonne CO <sub>2</sub> eq.)	30	2
Category	Plastic beverage stirrer	Wooden Stirrer									
Waste generated (tonnes)	10	20									
Carbon impacts (tonne CO <sub>2</sub> eq.)	30	2									

Measure No 4											
Material/item to be restricted:	Plastic straws										
The alternative option	Wax-lined paper straws										
Notes:											
SEA criteria	Score	Commentary									
Will the alternative option contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland?	++	<p>Our analysis shows that the alternative option can reduce the carbon impacts by 70% (i.e., 550 t CO<sub>2</sub> eq.).</p> <table border="1"> <caption>Measure no. 4 Straws</caption> <thead> <tr> <th>Category</th> <th>Plastic straws</th> <th>Wax-line paper straws</th> </tr> </thead> <tbody> <tr> <td>Waste generated (tonnes)</td> <td>170</td> <td>320</td> </tr> <tr> <td>Carbon impacts (tonne CO<sub>2</sub> eq.)</td> <td>810</td> <td>260</td> </tr> </tbody> </table>	Category	Plastic straws	Wax-line paper straws	Waste generated (tonnes)	170	320	Carbon impacts (tonne CO <sub>2</sub> eq.)	810	260
Category	Plastic straws	Wax-line paper straws									
Waste generated (tonnes)	170	320									
Carbon impacts (tonne CO <sub>2</sub> eq.)	810	260									

<b>Measure No 5</b>											
Material/item to be restricted:	Plastic balloon sticks										
The alternative option	Cardboard balloon sticks										
Notes:											
SEA criteria	Score	Commentary									
Will the alternative option contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland?	+	<p>Our analysis shows that the alternative option can reduce the carbon impacts by 70% (i.e., 30 t CO<sub>2</sub> eq.).</p> <table border="1"> <caption>Measure no. 5 Balloon sticks</caption> <thead> <tr> <th>Material</th> <th>Waste generated (tonnes)</th> <th>Carbon impacts (tonne CO<sub>2</sub> eq.)</th> </tr> </thead> <tbody> <tr> <td>Plastic balloon sticks</td> <td>10</td> <td>40</td> </tr> <tr> <td>Cardboard balloon sticks</td> <td>20</td> <td>10</td> </tr> </tbody> </table>	Material	Waste generated (tonnes)	Carbon impacts (tonne CO <sub>2</sub> eq.)	Plastic balloon sticks	10	40	Cardboard balloon sticks	20	10
Material	Waste generated (tonnes)	Carbon impacts (tonne CO <sub>2</sub> eq.)									
Plastic balloon sticks	10	40									
Cardboard balloon sticks	20	10									

Measure No 6											
Material/item to be restricted:	Food containers made of expanded polystyrene										
The alternative option	Wax-coated cardboard boxes										
Notes:											
SEA criteria	Score	Commentary									
Will the alternative option contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland?	++	<p>Our analysis shows that the alternative option can reduce the carbon impacts by 50% (i.e., 1,100 t CO<sub>2</sub> eq.).</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;"><b>Measure no. 6 Food containers made of expanded polystyrene</b></p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Metric</th> <th>Food containers made of expanded polystyrene</th> <th>Cardboard boxes</th> </tr> </thead> <tbody> <tr> <td>Waste generated (tonnes)</td> <td>330</td> <td>660</td> </tr> <tr> <td>Carbon impacts (tonne CO<sub>2</sub> eq.)</td> <td>2,140</td> <td>1,040</td> </tr> </tbody> </table> </div>	Metric	Food containers made of expanded polystyrene	Cardboard boxes	Waste generated (tonnes)	330	660	Carbon impacts (tonne CO <sub>2</sub> eq.)	2,140	1,040
Metric	Food containers made of expanded polystyrene	Cardboard boxes									
Waste generated (tonnes)	330	660									
Carbon impacts (tonne CO <sub>2</sub> eq.)	2,140	1,040									

Measure No 7											
Material/item to be restricted:	Cups and beverage containers made of expanded polystyrene <sup>52</sup>										
The alternative option	Plastic-coated paper cups										
Notes:											
SEA criteria	Score	Commentary									
Will the alternative option contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland?	-	<p>Our analysis shows that the alternative option can potentially increase the carbon impacts by 100% (i.e., 680 t CO<sub>2</sub> eq.).</p> <p><b>Measure no. 7 Cups and beverage containers made of expanded polystyrene</b></p> <table border="1"> <thead> <tr> <th>Category</th> <th>Cups made of expanded polystyrene</th> <th>Plastic-line paper cups</th> </tr> </thead> <tbody> <tr> <td>Waste generated (tonnes)</td> <td>120</td> <td>500</td> </tr> <tr> <td>Carbon impacts (tonne CO<sub>2</sub> eq.)</td> <td>680</td> <td>1,360</td> </tr> </tbody> </table>	Category	Cups made of expanded polystyrene	Plastic-line paper cups	Waste generated (tonnes)	120	500	Carbon impacts (tonne CO <sub>2</sub> eq.)	680	1,360
Category	Cups made of expanded polystyrene	Plastic-line paper cups									
Waste generated (tonnes)	120	500									
Carbon impacts (tonne CO <sub>2</sub> eq.)	680	1,360									

<sup>52</sup> This category covers both item 8 and 9 listed in part B of the Directive's Annex: Beverage containers made of expanded polystyrene, including their caps and lids, and Cups for beverages made of expanded polystyrene, including their covers and lids.

Measure No 8											
Material/item to be restricted:	Oxo-degradable HDPE										
The alternative option	Conventional HDPE										
Notes:											
SEA criteria	Score	Commentary									
Will the alternative option contribute to the reduction of greenhouse gas (GHG) emissions generated in Scotland?	+	<p>Our analysis shows that the alternative option can reduce the carbon impacts by 10% (i.e. 80 t CO<sub>2</sub> eq.).</p> <table border="1"> <caption>Measure no. 8 Oxo-degradable HDPE</caption> <thead> <tr> <th>Category</th> <th>Oxo-degradable HDPE</th> <th>Conventional HDPE</th> </tr> </thead> <tbody> <tr> <td>Waste generated (tonnes)</td> <td>230</td> <td>230</td> </tr> <tr> <td>Carbon impacts (tonne CO<sub>2</sub> eq.)</td> <td>850</td> <td>770</td> </tr> </tbody> </table>	Category	Oxo-degradable HDPE	Conventional HDPE	Waste generated (tonnes)	230	230	Carbon impacts (tonne CO <sub>2</sub> eq.)	850	770
Category	Oxo-degradable HDPE	Conventional HDPE									
Waste generated (tonnes)	230	230									
Carbon impacts (tonne CO <sub>2</sub> eq.)	850	770									

#### 4.4 Mitigation and Enhancement

The majority of single-use non-plastic items that would likely replace single-use plastic products are expected to achieve a reduction in greenhouse gas emissions. This intervention should not however undermine the substantial carbon savings attributed to shifting from single-use to multi-use items, such as replacing single-use plastic-coated paper cups with reusable cups. World literature is abundant with studies that have quantitatively confirmed that multi-use scenarios (and in particular with respect to cups and food containers) tend to have higher carbon savings than all single-use options<sup>53</sup>.

Replacing single-use plastic products with reusable, non-plastic alternatives will hold obvious emissions benefits as stated above. If no product were required at all (single-use plastic or otherwise), this would ultimately achieve the highest carbon saving, as reported by numerous studies published in this area. However, there are obvious practical implications with such a scenario.

<sup>53</sup> European Union (2018) Life Cycle Inventories of Single Use Plastic Products and their Alternatives [Online]. Available at: [https://ec.europa.eu/environment/index\\_en.htm](https://ec.europa.eu/environment/index_en.htm)

## 5. Material Assets

Whilst the SEA legislation does not provide any definition of the term “material assets”, the SEPA guidance states that material assets include built assets and natural assets. The scope of “built assets and natural assets” is therefore defined, within this Environmental Report, as encompassing the following:

- Natural assets – raw source of compositional materials of targeted single-use plastic items and any raw materials used to support waste infrastructure;
- Built assets – land take and soil use/loss for new infrastructure;
- Built assets – any new infrastructure required for the adoption of the alternative option.

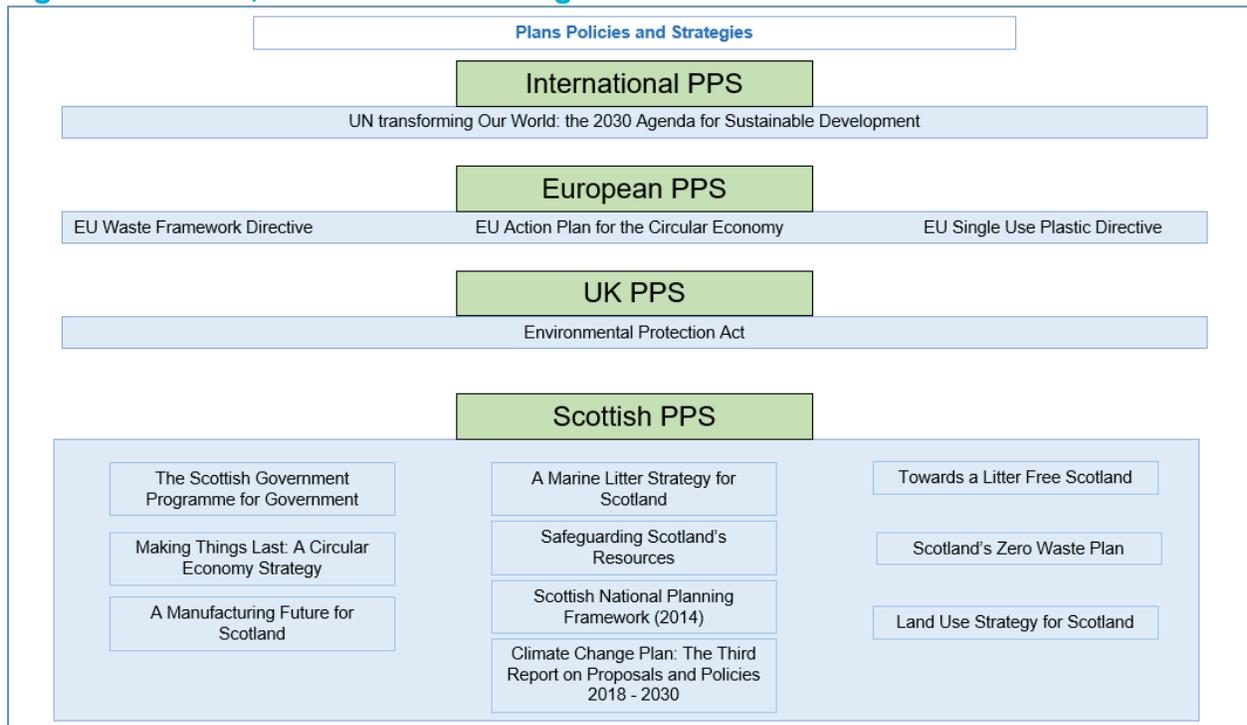
This section provides the contextual information to inform the assessment (in terms of the review of Plans, Programmes and Strategies (PPS) and the baseline information) as well as an assessment of the effects of the SUP Directive on material assets.

### 5.1 Relationship with other Plans, Programmes and Strategies and Environmental Objectives

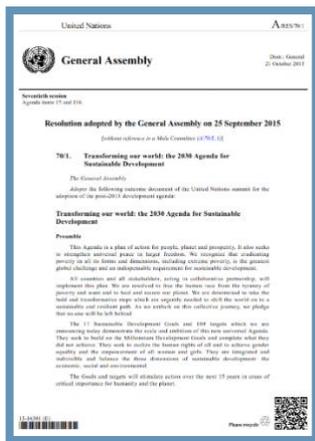
The PPS relevant to the material asset topic area are shown in **Figure 5-1** and summarised thereafter.

For the purposes of this SEA, it is assumed that the broad objectives of extant European Union (EU) legislation will be maintained once the UK has withdrawn from the EU and that similar or equivalent environmental protections will remain in place.

**Figure 5-1 Plans, Policies and Strategies related to Material Assets**



The relationship between the identified PPSs and the Restriction of single-use plastic items placed on the Scottish Market are outlined below.



**United Nations (2015): Transforming our World - the 2030 Agenda for Sustainable Development** sets out 17 global goals agreed by the United Nations. These goals are embedded within the agenda for 15 years and include commitments to protect the planet through sustainable consumption and sustainable management of resources. Placing market restrictions on specific single-use plastic items and oxo-degradable plastics will support Scotland's efforts toward these global goals by seeking to embed sustainability and resource minimisation across all sectors of society and stimulating a departure from single-use plastic items in Scotland. Key sustainable development goals relevant to

market restrictions on single-use plastic items include:

- Goal 12: Ensure sustainable consumption and production patterns
- Goal 13: Take urgent action to combat climate change and its impacts
- Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

- Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

It is predicted that an increase in paper-based products may have implications on the allocation of land use, as greater areas will be required to grow more trees that will be required to meet demand.

**European Union (2008): The EU Waste Framework Directive introduced a definition for waste.** The Directive introduced key principles to ensure that waste is managed without endangering human, environmental or ecological health. The Directive also introduced the Waste Hierarchy, the "polluter pays principle" and "extended producer responsibility". It included two new recycling and recovery targets to be achieved by 2020:

- 50% for re-use and recycling of household wastes, and
- 70% for re-use, recycling and other recovery of construction and demolition waste

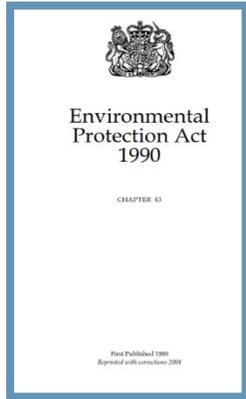


The Directive requires member states to establish national waste prevention programmes accordingly. Restricting specific single-use plastic items in Scotland will proliferate a reduction in plastic waste in line with Directive targets. The Framework Directive necessitates that member states radically enhance waste management and recycling practices. Restrictions on hard-to-recycle single-use plastic items will have the likely effect of increasing recycling efficiency in Scotland, with resultant positive impacts on waste management. Wood-based products have a shorter degradation period than plastic, however an increase in such products will mean a consequent increase in the woodland required to produce them.

**European Union (2018): The EU Action Plan for the Circular Economy** details an [EU Action Plan for the Circular Economy](#). The Action Plan provides a context for the restriction of single-use plastic products by requiring member states to radically enhance waste management and recycling practices; to design out waste, to design products with longer use phases and which can be recycled (if not repaired/remanufactured) at end of life. The main aims and provisions of the Plan are outlined within Section 4.1 above.

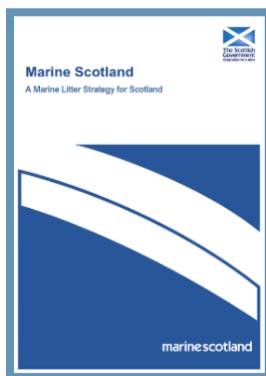
**European Union (2019): Directive on the reduction of the impact of certain plastic products on the environment** highlights significant negative environmental, health and economic impacts stemming from the continued use of certain plastic products. The aims and provisions of this Directive are outlined in Section 4.1 (above). In the context

of Material Assets, the Directive seeks to instil a greater respect for preservation of resources, and in developing a more circular approach to material use, that sees the need for fewer virgin materials through greater resource efficiency.



**UK Government (1990): The Environmental Protection Act** seeks to improve resource use and environmental performance through the control of waste collections and management across the UK. The Act designates the regime for licensing of waste operations and provides the first definition of “controlled wastes” (*known as Hazardous Wastes in Scotland*). The Act introduced the Duty of Care for producers, carriers, importers and exporters, and also introduced criminal offences regarding litter in a bid to reduce littering across the UK. The Act requires the UK to tightly control the movement and handling of wastes.

**The Scottish Government (2020): The Scottish Government Programme for Government (2020-21)** outlines the Government’s commitment to tackle climate change and to prepare Scotland for the new, low carbon world. The main objectives of the Programme are outlined in Section 4.1 (above). The programme seeks to increase recycling rates and stimulate greater resource efficiency and respect for material assets by developing a route map to reduce waste and meet 2025 recycling targets as well as boosting the circularity of the Scottish economy.



**Scottish Government (2014): A Marine Litter Strategy for Scotland** identified five proposed strategic directions to reach a zero waste Scotland, supported by responsible behaviours. The strategy seeks to address litter within the marine environment between 2013 and 2020. The objectives of the strategy are to enhance current legislation to promote effective clean-up of contaminated areas whilst supporting local and national stakeholders to understand and support litter-free urban areas. The strategy complements the introduction of market restrictions on single-use plastic items as a preventative measure which will help realise the vision of a “clean, healthy, safe, productive and

biologically diverse marine and coastal environment that meets the long term needs of people and nature”.<sup>54</sup>

**Scottish Government (2014): Toward a Litter free Scotland - The National Litter Strategy (2014)** sets clear actions which have an impact upon material assets when seeking to improve the environment through targeted approaches to litter and fly-tipping. The strategy seeks to educate the public to adopt alternative behaviours to waste management through access to improved recycling opportunities, improved product design, awareness campaigns and targeted exploration to tackle litter on beaches. The strategy also proposes exploring enforcement opportunities and identifying pilot solutions to litter. Placing restrictions on specific single-use plastic items will support delivery of these actions and ambitions by limiting the impacts of disposable items and promoting the development of sustainable alternatives.

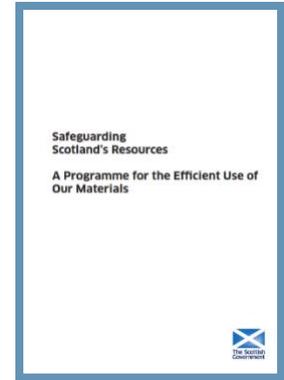


**Scottish Government (2016) Making Things Last – A Circular Economy Strategy** is Scotland’s first circular economy strategy. The strategy endeavours to set out early priorities to embed the circular economy across key Scottish sectors including manufacturing. It seeks to embed circular economy principles into the manufacturing process, to design materials for reuse, recycling and recovery, whilst embedding a mindset across the public that materials are finite and that current consumptions patterns and reliance on ‘single-use’ are unsustainable. The Strategy repeats the targets to recycle 70% of all waste and to send no more than 5% of all waste to landfill by 2025. It also reiterates the need to promote a shift away from the prevailing take-make-dispose consumption pattern.

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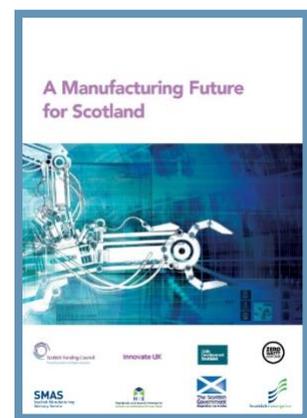
<sup>54</sup> The Scottish government (2014) [A Marine Litter Strategy for Scotland](http://www.gov.scot/) [Online]. Available at: [www.gov.scot/](http://www.gov.scot/)

**Scottish Government (2013): Safeguarding Scotland's Resources** set out the ambition to minimise the resources needed to sustain the market demand for products in Scotland. The document sets out a range of measures to promote efficient use of materials and to reduce waste. A total of 13 actions are proposed to develop baseline evidence for circular economy opportunities, to influence behaviours, enhance the design of products and packaging, and to support businesses to prevent, manage and benchmark wastes.

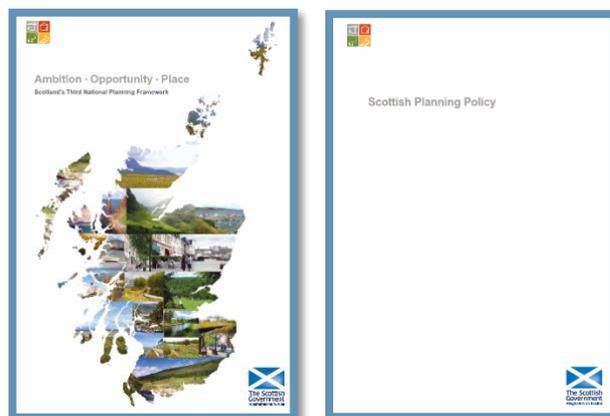


**Scottish Government (2013): Scotland's Zero Waste Plan** set out the Scottish Government's spearhead strategy to make the most of resources and to reduce, reuse and recycle more materials in Scotland. Measures to achieve the vision include using separate collections of specific waste types, increasing reuse and recycling opportunities and introducing new recycling targets of 70% of all waste recycled by 2025 and a maximum of 5% of all waste to landfill by 2025. The Zero Waste Plan is the flagship policy for Scotland's waste ambitions. The market restriction of single-use plastics will have the likely impact of stimulating greater recycling and reuse as well as stimulating a significant reduction in plastic waste levels in Scotland.

**Scottish Enterprise (2016): A Manufacturing Future for Scotland** details a series of interventions to be adopted which will help nurture further growth across the manufacturing sector. The strategy seeks to support companies to reap the benefits of the circular economy through the opportunities linked to product design, manufacturing processes and supply chains. The strategy seeks to eradicate waste through innovation in product design and remanufacturing. The market restriction of single-use plastics can support the strategy by incentivising manufacturers to design products consistent with the vision of a more sustainable, resource-efficient Scotland.



**Scottish Government (2014): The Scottish National Planning Framework and Scottish Planning Policy** are two documents which promote waste as a resource. The framework and the planning policy recognise the need to appreciate the value of waste, and the role it plays in a more circular economy. Of particular note, the Scottish Planning Policy (para 175) recognises that *“waste is a resource and an opportunity, rather than a burden. Scotland has a Zero Waste Policy, which means wasting as little as possible and recognising that every item and material we use, either natural or manufactured, is a resource which has value for our economy.”* Materials with a high intrinsic value and which may be reused; such as renewable sustainable bio-based, or re-usable products that may replace single-use plastic products; would stimulate even greater resource efficiency within Scotland.



**Scottish Government (2011):** The first land use strategy for Scotland, **Getting the best from our land - A land use strategy for Scotland (2011)** had the objectives of: land-based businesses working with nature; responsible stewardship of Scotland's natural resources; and urban and rural communities better connected to the land. The vision, objectives and principles of the strategy were retained and built upon by the second land use strategy (published 2016) which covers the period 2016 – 2021. The Strategy promotes the need to utilise resources sustainably and aligns clearly with the objectives underpinning the market restriction on single-use plastics with regard to preservation of material assets.





**Scottish Government (2018): Climate Change Plan - The Third Report on Proposals and Policies 2018-2032** provides a progress update on the Government's Climate Change Plan. The main provisions of the plan are outlined in Section 4.1 (above). Restrictions on single-use plastic products within the Scottish market will promote less linear consumption models, stimulating the expansion of more circular practices, products and procedures in-line with the Plan. It will also improve recycle quality through reduced contamination in other secondary streams.

## 5.2 Baseline Characteristics

This section of the Environmental Report identifies and characterises current environmental baseline conditions for material assets and evaluates how these baseline conditions are likely to change due to the introduction or proposed market restrictions on single-use plastic items in scope.

As detailed in the section introduction, the scope of “built assets and natural assets” is defined within this Environmental Report, as:

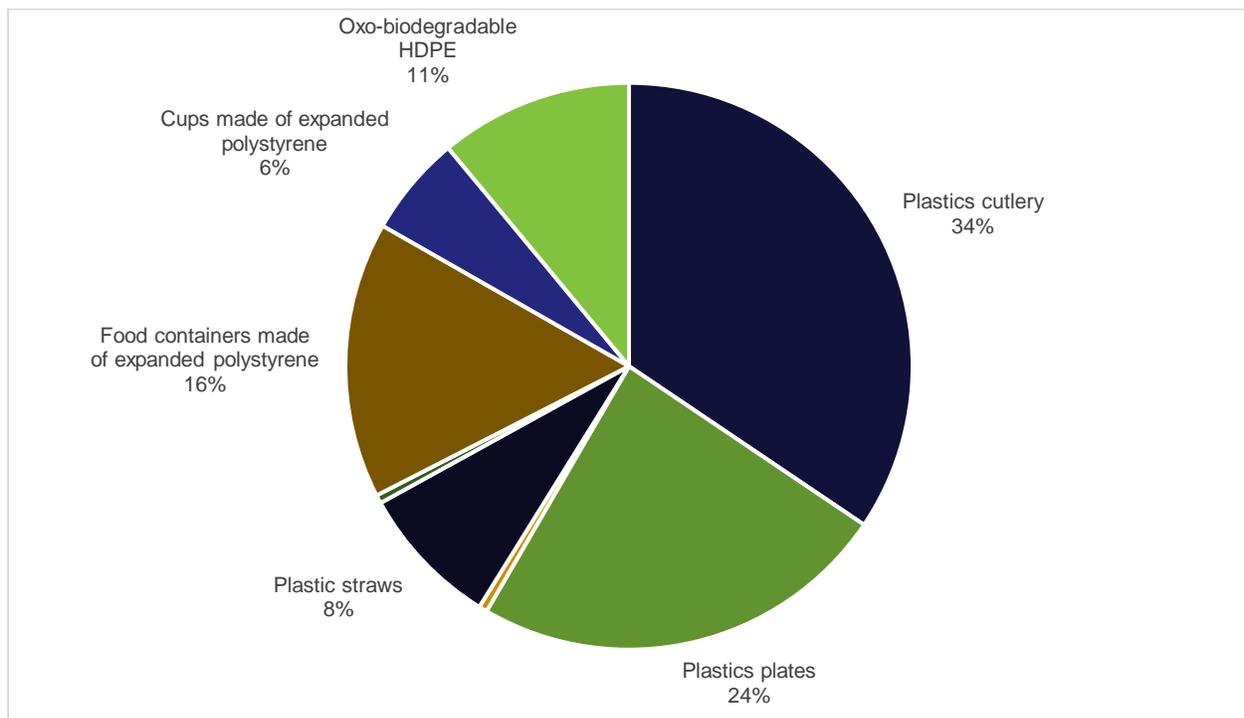
- Natural assets – collected waste materials and waste stream;
- Natural assets – raw source of compositional materials of alternative non-plastic single-use items and any raw materials used to support waste infrastructure;
- Built assets – land take and soil use/loss for new infrastructure;
- Built assets – any new infrastructure required for managing waste generated by alternative options.

### 5.2.1 Current Resource Use, Waste Management and Disposal of Materials Relevant to the SUP Directive

Our analysis estimates that the total number of single-use plastic items targeted by the Directive is around 777 million items with a total weight of approximately 2,100 tonnes.

**Figure 5-2** shows a breakdown of single-use plastic waste generated by item.

**Figure 5-2 the total weight of single-use plastic items by type.**



### 5.2.2 Current Infrastructure Associated with Waste Management

The majority of single-use plastic items are not recyclable and hence are either landfilled or incinerated. The total amount of single-use plastic waste generated is approximately 2,850 tonnes which is considered an insignificant proportion when compared to other waste streams and does not have a significant impact on the available capacity in existing infrastructure.

### 5.2.3 Predicted Future Trends in Relation to Scottish Government Waste Targets

The amount of single-use plastic waste is not deemed to have significant impacts on Scottish Government Waste Targets. Due to the heavier nature of alternative products, and assuming 100% replacement, the proposed market restrictions could result in more waste (approximately 1,440 tonnes, +70%) being generated, which would have a minor impact on Scotland's waste reduction target (See **Table 5-1**).

### 5.2.4 Likely Evolution of the Baseline without the SUP Directive

Without the proposed market restriction of single-use plastic items, it is expected that the prevalence of such products may still contract, although to a far smaller degree than if restrictions were implemented. This is due to many commercial entities opting to move away from single-use plastics generally, both to enhance their green credentials and for the protection of the environment. Such moves are taking place on an ad hoc, individual basis and so the effect of such measures would be far less reaching than a statutory restriction. Without a blanket restriction, the current volume of plastic waste in Scotland

would be likely to continue, along with attendant emissions surplus and litter levels This in turn would have significant detrimental effects on the Scottish landscape, the Scottish environment, resource efficiency and the territorial and outsourced emissions produced.

### 5.3 Consideration of Reasonable Alternatives

#### 5.3.1 Methodology

Changes in the amount of waste generated due to the adoption of non-plastic alternatives are estimated using market research data and average weight assumptions discussed in Section 4.3.1.

#### 5.3.2 Results

The assessment considers the anticipated changes to the material demand for producing single-use plastic items and waste generated (**Table 5-1**).

Single-use plastic items are lightweight and hence the total amount of virgin materials is deemed to be insignificant when compared to other waste streams (i.e., 2850 tonnes). However, their negative environmental impacts on marine and wildlife are significant due to leakages and litter, hence the proposed market restrictions.

**Table 5-1 Total amount of waste generated by SUP items and alternative options.**

Measure No	Single-use plastic item in scope	Waste generated (tonnes)		Difference (tonnes)	Change (%)
		Single-use plastics	Alternative option		
1	Cutlery	720	830	110	15%
2	Plates	500	950	450	90%
3	Beverage Stirrer	10	20	10	100%
4	Straws	170	320	150	88%
5	Balloon sticks	10	20	10	100%
6	Food containers made of expanded polystyrene	330	660	330	100%
7	Cups and beverage containers made of expanded polystyrene	120	500	380	317%
8	Oxo-biodegradable HDPE	230	230	-	0%
	<b>Total</b>	<b>2,090</b>	<b>3,530</b>	<b>1,440</b>	<b>69%</b>

Built assets include waste infrastructure which facilitates the collection, reprocessing and/or disposal of the materials as a waste. The scope includes the land used and loss of habitats therein.

The key to each assessment score is shown below:

Score Key:	++	+	0	-	--	?
	Significant positive effect	Minor positive effect	No overall effect	Minor negative effect	Significant negative effect	Score uncertain
<p>NB: where more than one symbol is presented in a box it indicates that the SEA has found more than one score for the category. Where the scores are both positive and negative, the boxes are deliberately not coloured (i.e. 'no overall effect'). Where a box is coloured but also contains a "?" this indicates uncertainty over whether the effect could be a minor or significant effect although a professional judgement is expressed in the colour used. A conclusion of uncertainty arises where there is insufficient evidence for expert judgement to conclude an effect.</p>						

<b>Measure No 1</b>		
Material/item to be restricted:	Plastic cutlery	
The alternative option	Wooden cutlery	
Notes:		
SEA criteria	Score	Commentary
Will it contribute towards achieving Scotland's waste targets?	<b>+/?</b>	The weight of wooden cutlery is expected to be 15% higher than the plastic option (110 tonnes/year). Nevertheless, there is a possibility to collect wooden cutlery for composting which would consequently contribute to Scotland recycling targets. This is subject to the availability of infrastructure to collect and manage waste, and changes in people's attitudes to put single-use wooden items in the right bin.  No additional built infrastructure is required to manage waste generated by the non-plastic single-use alternative.
Will it increase the economic value and utility of affected materials?	<b>0</b>	We do not expect this measure to increase the economic value and utility of affected materials.
Will it reduce 'leakage' of material to landfill or energy recovery or as litter?	<b>+/?</b>	Yes, wooden cutlery is compostable and can contribute to Scotland's recycling targets, subject to the availability of infrastructure to collect and manage this waste stream.

<b>Measure No 2</b>		
Material/item to be restricted:	Plastic plates	
The alternative option	Wax-coated paper plates	
Notes:		
SEA criteria	Score	Commentary
Will it contribute towards achieving Scotland's waste targets?	<b>+/?</b>	<p>The weight of wax-coated paper plates is expected to be 90% higher than the plastic option (450 tonnes/year) which will increase the amount of waste generated. However, there is a possibility to collect wax-coated paper plates for composting which would consequently contribute to Scotland recycling targets. This is subject to the availability of infrastructure to collect and manage waste, and changes in people's attitudes to put wax-coated paper plates in the right bin.</p> <p>No additional built infrastructure is required to manage waste generated by the non-plastic single-use alternative.</p>
Will it increase the economic value and utility of affected materials?	<b>0</b>	We do not expect this measure to increase the economic value and utility of affected materials.
Will it reduce 'leakage' of material to landfill or energy recovery or as litter?	<b>+/?</b>	Yes, paper plates are compostable and can contribute to Scotland's recycling targets, subject to the availability of infrastructure to collect and manage this waste stream.

<b>Measure No 3</b>		
Material/item in scope	Plastic beverage stirrer	
The alternative option	Wooden stirrer	
Notes:		
SEA criteria	Score	Commentary
Will it contribute towards achieving Scotland's waste targets?	<b>+/?</b>	<p>The weight of a wooden stirrer is expected to be 100% higher than the plastic option (10 tonnes/year) which will increase the amount of waste generated. However, there is a possibility to collect wooden stirrers for composting which would consequently contribute to Scotland recycling targets. This is subject to the availability of infrastructure to collect and manage waste, and changes in people's attitudes to put single-use wooden items in the right bin.</p> <p>No additional built infrastructure is required to manage waste generated by the non-plastic single-use alternative.</p>
Will it increase the economic value and utility of affected materials?	<b>0</b>	We do not expect this measure to increase the economic value and utility of affected materials.
Will it reduce 'leakage' of material to landfill or energy recovery or as litter?	<b>+/?</b>	Yes, wooden stirrers are compostable and can contribute to Scotland's recycling targets, subject to the availability of infrastructure to collect and manage this waste stream.

<b>Measure No 4</b>		
Material/item in scope	Plastic straws	
The alternative option	Wax-coated paper straws	
Notes:		
SEA criteria	Score	Commentary
Will it contribute towards achieving Scotland's waste targets?	<b>+/?</b>	<p>The weight of wax-coated paper straws is expected to be 88% higher than the plastic option (150 tonnes/year) which will increase the amount of waste generated. However, there is a possibility to collect wax-coated paper straws to be composted with food waste which would consequently contribute to Scotland recycling targets. This is subject to the availability of infrastructure to collect and manage waste, and changes in people's attitudes to put single-use paper straws in the right bin.</p> <p>No additional built infrastructure is required to manage waste generated by the non-plastic single-use alternative.</p>
Will it increase the economic value and utility of affected materials?	<b>0</b>	We do not expect this measure to increase the economic value and utility of affected materials.
Will it reduce 'leakage' of material to landfill or energy recovery or as litter?	<b>+/?</b>	Yes, wax-coated paper straws are compostable and can contribute to Scotland's recycling targets, subject to the availability of infrastructure to collect and manage this waste stream.

<b>Measure No 5</b>		
Material/item in scope	Plastic balloon sticks	
The alternative option	Cardboard balloon sticks	
Notes:		
SEA criteria	Score	Commentary
Will it contribute towards achieving Scotland's waste targets?	<b>+/?</b>	<p>The weight of cardboard balloon sticks is expected to be 100% higher than the plastic option (10 tonnes/year) which will increase the amount of waste generated. However, there is a possibility to collect cardboard balloon sticks to be composted with food waste which would consequently contribute to Scotland recycling targets. This is subject to the availability of infrastructure to collect and manage waste, and changes in people's attitudes to put cardboard balloon sticks in the right bin.</p> <p>No additional built infrastructure is required to manage waste generated by the non-plastic single-use alternative.</p>
Will it increase the economic value and utility of affected materials?	<b>0</b>	We do not expect this measure to increase the economic value and utility of affected materials.
Will it reduce 'leakage' of material to landfill or energy recovery or as litter?	<b>+/?</b>	Yes, cardboard balloon sticks are compostable and can contribute to Scotland's recycling targets, subject to the availability of infrastructure to collect and manage this waste stream.

<b>Measure No 6</b>		
Material/item in scope	Food containers made of expanded polystyrene	
The alternative option	Wax-coated cardboard boxes	
Notes:		
SEA criteria	Score	Commentary
Will it contribute towards achieving Scotland's waste targets?	<b>+/?</b>	<p>The weight of wax-coated cardboard boxes is expected to be 100% higher than the plastic option (330 tonnes/year) which will increase the amount of waste generated. However, there is a possibility to collect cardboard balloon sticks to be composted with food waste which would consequently contribute to Scotland recycling targets. This is subject to the availability of infrastructure to collect and manage waste, and changes in people's attitudes to put wax-coated cardboard boxes in the right bin.</p> <p>No additional built infrastructure is required to manage waste generated by the non-plastic single-use alternative.</p>
Will it increase the economic value and utility of affected materials?	<b>0</b>	We do not expect this measure to increase the economic value and utility of affected materials.
Will it reduce 'leakage' of material to landfill or energy recovery or as litter?	<b>+/?</b>	Yes, wax-coated cardboard boxes are compostable and can contribute to Scotland's recycling targets, subject to the availability of infrastructure to collect and manage this waste stream.

<b>Measure No 7</b>		
Material/item in scope	Cups and beverage containers made of expanded polystyrene <sup>55</sup>	
The alternative option	Plastic-coated paper cups	
Notes:		
SEA criteria	Score	Commentary
Will it contribute towards achieving Scotland's waste targets?	-	The weight of plastic-coated paper cups is expected to be 317% higher than the plastic option (380 tonnes /year) which will increase the amount of waste generated. What's more, a recent report by Scotland's Expert Panel on Charges and Other Measures <sup>56</sup> states that only 2% of single-use paper cups are recycled in Scotland, with the majority either landfilled or incinerated.  If EPECOM's recommendation to put in place a charge on single-use cups is taken forward, this could significantly reduce consumption and so the overall environmental impacts of this product category.
Will it increase the economic value and utility of affected materials?	0	We do not expect this measure to increase the economic value and utility of affected materials.
Will it reduce 'leakage' of material to landfill or energy recovery or as litter?	0	No, switching from EPS cups to paper cups without the availability of recycling infrastructure and behaviour change will not reduce the amount of single-use cups landfilled or incinerated.

<sup>55</sup> This category covers both item 8 and 9 listed in part B of the Directive's Annex: Beverage containers made of expanded polystyrene, including their caps and lids, and Cups for beverages made of expanded polystyrene, including their covers and lids.

<sup>56</sup> EPECOM (2019) [Single-use disposable cups: EPECOM recommendations](http://www.gov.scot/) [Online]. Available at: [www.gov.scot/](http://www.gov.scot/)

Measure No 8		
Material/item in scope	Oxo-degradable HDPE	
The alternative option	Conventional HDPE	
Notes:		
SEA criteria	Score	Commentary
Will it contribute towards achieving Scotland's waste targets?	<b>0</b>	Switching from oxo-degradable to conventional plastic is not expected to have any impact on the amount of waste generated nor recycled as both types of plastic are not widely recycled in Scotland.  No additional built infrastructure is required to manage waste generated by the non-plastic single-use alternative.
Will it increase the economic value and utility of affected materials?	<b>0</b>	We do not expect this measure to increase the economic value and utility of affected materials.
Will it reduce 'leakage' of material to landfill or energy recovery or as litter?	<b>0</b>	No, switching from Oxo-degradable HDPE to Conventional HDPE without the availability of recycling infrastructure will not reduce the amount of HDPE plastics landfilled or incinerated.

## 5.4 Mitigation and Enhancement

Single-use plastic items targeted by market restrictions are expected to be replaced by heavier single-use items made of paper or wood. This will lead to a shift in materials used from fossil-based materials to wood or paper which will require additional land and water resources. There are some non-plastic alternatives which are not recyclable and hence will end up landfilled or incinerated. This can be best addressed through greater application of multi-use items and particularly for frequently used items such as plates and cups. Other recyclable alternatives, primarily made of wood or fibre, can be composted and so it would be imperative to increase access to and use of appropriate recycling infrastructure to ensure the capture of these materials for recycling.

More importantly, additional measures should be considered in order to reduce the generation of non-plastic single-use items and incentivise behavioural change towards the adoption of multi-use alternatives.

## 6. Landscape and visual impacts

**This section outlines the assessment of the proposed market restrictions against the scoped in topic of landscape and visual impacts. Whilst the SEA legislation does not provide any definition of the term “landscape” or “visual impacts”, NatureScot<sup>57</sup> quote the definition of the European Landscape Convention in defining landscape as “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors”.**

**This section provides the contextual information to inform the assessment (in terms of the review of Plans, Programmes and Strategies (PPS) and the baseline information) as well as an assessment of the effects of the SUP Directive on landscape impacts.**

### 6.1 Relationship with other Plans, Programmes and Strategies and Environmental Objectives

The PPS that are relevant to the landscape and visual impact topic that have been reviewed to inform the assessment exercise are shown in

Figure 6-1 and summarised thereafter.

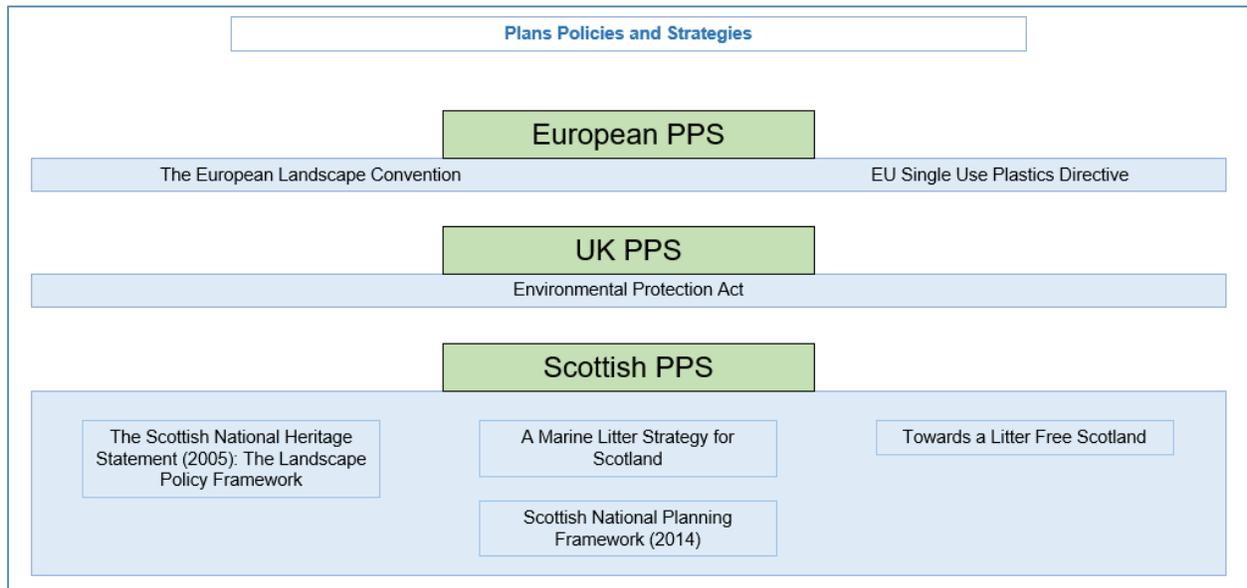
For the purposes of the review of the international plans and programmes for this SEA, it is assumed that the broad objectives of extant European Union (EU) legislation will be

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<sup>57</sup> The Scottish Environment Protection Agency (2011) The Scottish Strategic Environmental Assessment Review [Online]. Available at: <https://www.nature.scot/>

maintained once the UK has withdrawn from the EU and that similar or equivalent environmental protections will remain in place.

**Figure 6-1 Plans, Policies and Strategies related to Landscape and Visual Impacts.**

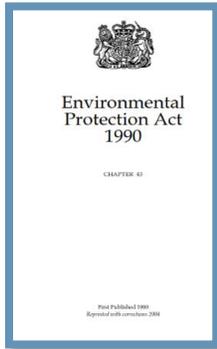


The relationship between the identified PPS and the restriction of single-use plastic items placed on the Scottish market are outlined below.

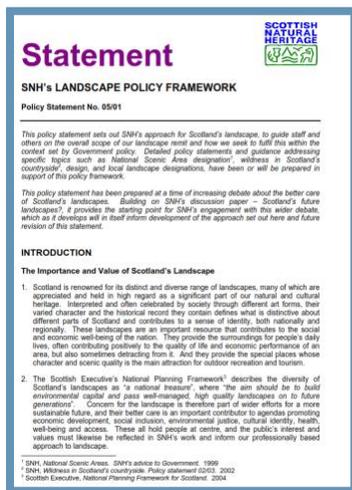
**The European Landscape Convention (2006)** seeks to promote the protection and management of urban and rural spaces. The ELC promotes the principles of developing and protecting landscapes through implementation of Landscape Quality Objectives requiring authorities to support public aspirations for their surroundings as opposed to solely expert opinion. The principles of the ELC are consistent with the aims of restricting single-use plastic items placed on the Scottish market in the preservation of the Scottish landscape which suffers significant and continued detriment through the prevalence of plastic litter. The ELC was adopted by the UK in 2006.

**European Union (2019): Directive on the reduction of the impact of certain plastic products on the environment** highlights significant negative environmental, health and economic impacts stemming from the continued use of certain plastic products. The aims and provisions of this Directive are outlined in Section 4.1 (above). In the context of Visual Impacts, embedding a more circular approach to resources will precipitate a reduction in waste and litter, which in turn will improve the aesthetic of the Scottish

landscape. A reduction in plastic waste will also shorten the degradation period of littered materials.



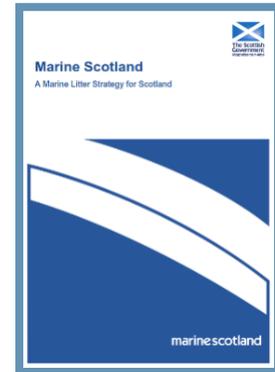
**UK Government (1990): The Environmental Protection Act** seeks to improve resource use and environmental conditions through the control of waste collections and management across the UK. The main provisions of the Act are outlined in Section 5.1 (above). Restriction of single-use plastic materials in Scotland supports the ambitions of the act in ensuring that detrimental impacts of plastic on the Scottish environment, owing to its brief use phase and long degradation period, are significantly limited. By prescribing that littering is an offence, the Act seeks to deter occurrences of littering, thus diminishing its impact on the beauty of Scotland.



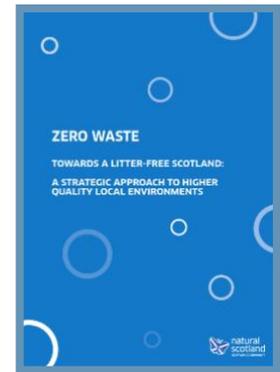
**The NatureScot Statement (2005): The Landscape Policy Framework (Policy Statement No. 05/01)** sets out Scottish Natural Heritage (now NatureScot) approach on conserving and managing Scottish landscapes. The document emphasises the importance of landscapes across Scotland to both individual well-being and the economic success of an area. The document reiterates the remit of NatureScot to preserve the aesthetics and natural qualities whilst protecting wildlife and natural schemes. Key actions of NatureScot include developing a sense of responsibility for landscapes across Scotland whilst acting as a statutory consultee to ensure landscape interests are considered in decision making. Restricting single-use plastic items within the Scottish market will support these

ambitions by reducing litter across landscapes and nurturing a new behavioural paradigm of improved resource management.

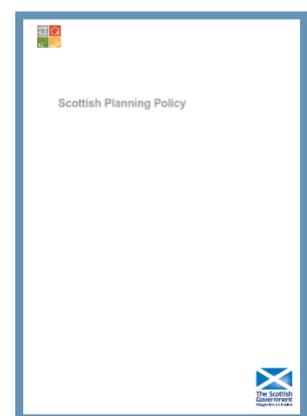
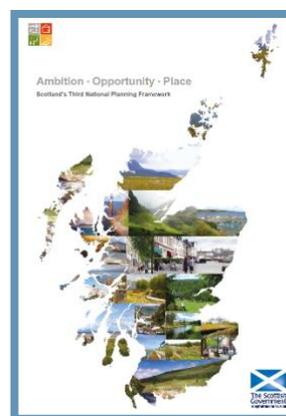
**Scottish Government (2014): A Marine Litter Strategy for Scotland** identified five proposed strategic directions to reach a Zero Waste Scotland, supported by responsible behaviours. The main aims of the Strategy are outlined in Section 5.1 (above). The strategy seeks to reduce the litter entering the marine environment, with plastic being identified as a major contributor, and one which has particularly detrimental characteristics in terms of visual impacts on the landscape and marine habitats in Scotland. Restriction of single-use plastic products would support the drive to reduce littering in a marine environment, by necessitating their replacement by less harmful alternatives.



**Scottish Government (2014): Toward a Litter free Scotland - The National Litter Strategy** sets clear actions which have an impact upon material assets, when seeking to improve the environment through targeted approaches to litter and fly-tipping. The main aims of the Strategy are outlined in Section 5.1 (above). The restrictions of single-use plastic products will promote the outcomes of the Strategy by limiting the amount of plastic waste in circulation within Scotland, and the resultant harm to visual impacts caused by the leakage of this waste into the Scottish terrestrial and marine habitats.



**Scottish Government (2014): The Scottish National Planning Framework and Scottish Planning Policy** are two documents which promote waste as a resource. The main objectives of the documents are outlined in Section 5.1 (above). The Framework promotes the protection of Scottish lands from productive soils, to water resources and the natural landscapes, and this includes protection from littering and the leaching of microplastics into the Scottish terrestrial and marine habitat.



## 6.2 Baseline Characteristics

This section of the Environmental Report identifies and characterises current environmental baseline conditions for landscape and visual impacts. This baseline highlights the diverse nature of Scotland's landscapes. It also identifies the terrestrial and marine litter levels for the single-use plastic items in scope, and the impact litter has on communities and local environments.

### 6.2.1 Landscape (including townscapes and built heritage)

Scottish Natural Heritage (now NatureScot) identified a series of Natural Heritage Zones as part of their Natural Heritage Futures initiative and used these areas to describe a vision for sustainable use of local natural heritage. A total of 21 zones were identified<sup>58</sup>, each having their own identity resulting from the interaction of geology, landforms, wildlife and land use.

Scotland has 40 National Scenic Areas (NSAs) covering more than one million hectares (12.7% of Scotland). The Planning etc. (Scotland) Act 2006 gives a statutory basis to NSAs. The purpose of the NSA designation is both to identify Scotland's finest scenery and to ensure it is protected from inappropriate development. This is achieved through the local authority planning scheme<sup>59</sup>. Other areas designated for their landscape include two National Parks and three Regional Parks together with a number of Special (local) Landscape Areas<sup>60</sup>.

### 6.2.2 Litter

#### 6.2.2.1 Terrestrial Litter

The majority of litter in Scotland is discarded by members of the public, with business and commercial waste each accounting for less than 5% of total litter presence<sup>61</sup>.

A 2016 survey<sup>62</sup> by Keep Scotland Beautiful sought to identify the composition and distribution of litter in Scotland by recording the type and number of littered items in a

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<sup>58</sup> NatureScot (2002) *Natural Heritage Zones: A National Assessment of Scottish Landscapes*. [Online]. Available at: <http://www.snh.org.uk>

<sup>59</sup> Scottish Natural Heritage (2017) *National Scenic Areas*. [Online]. Available at: <http://www.scotland.gov.uk>

<sup>60</sup> The term used for such local landscape designations varies from one local authority to another. For example, they are currently termed 'Areas of Great Landscape Value' in Moray, 'Special Landscape Areas' in Dumfries and Galloway, and 'Sensitive Landscape Character Areas' in Ayrshire. However, guidance published by Scottish Natural Heritage and Historic Environment Scotland suggests the name be standardised to Special Landscape Area (SLA)

<sup>61</sup> Keep Britain Tidy (2017) *Beacons of litter: A social experiment to understand how the presence of certain littered items influences rates of littering* [Online]. Available at: <https://www.keepbritaintidy.org>

<sup>62</sup> Keep Scotland Beautiful (2016) *Composition of Litter in Scotland* [Online]. Available at: [www.incpen.org](http://www.incpen.org)

representative selection of sites and to compare the results to an equivalent survey undertaken in 2014. A total of 120 sites were surveyed, with 30 in Edinburgh, Falkirk, Renfrewshire and Inverness respectively. Whilst all types of litter were recorded, of particular relevance to these proposals are the types of plastic litter items recovered.

The breakdown of these items is as follow:

- Drinking straws: 23 items, 0.4% of all litter
- Drinking cups (not all EPS): 27 items, 0.5% of all litter. An analysis by Resource Futures estimates that expanded polystyrene cups made up 0.14% of dropped litter waste by item count in Wales<sup>63</sup>.
- Other drinks related (including stirrers): 5 items, 0.1% of all litter.
- Fast food packaging (not all EPS): 33 items, 0.6% of all litter
- Other food related (might include cutlery/plates): 6 items, 0.1%

Keep Britain Tidy's latest Local Environmental Quality Survey of England (LEQSE)<sup>64</sup> (2017/2018), covering terrestrial litter found that 52% of sites were affected by non-alcoholic drinks-related litter (which includes drinks carton straws), and 12% of sites were affected by fast food-related litter (which includes large drinking straws and stirrers from fast food outlets and coffee shops).

The Keep Britain Tidy 2013/14 litter composition survey<sup>65</sup> of England found the composition of terrestrial litter, by item count, was:

- 2.0% straws;
- 1.2% cartons (some containing straws) and
- 6.4% fast food packaging (fast food straws and stirrers are not individually reported).

This suggests that plastic straws are likely to account for between 2% and 10% of litter items, (most likely in the lower part of this range at around 2-4%). The prevalence of plastic stirrers is harder to gauge but this is likely to be much lower than straws.

Although the results of both studies vary largely due to differences in methodologies and sample size, both sources highlight the littering of single-use plastic products.

Public Attitudes Towards Litter Survey work carried out by Zero Waste Scotland<sup>66</sup> found that:

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<sup>63</sup> Cole, G et al. (2019) [Preliminary Research to Assess the Impacts of a Ban or Restrictions in Sale in Wales of Items in the EU's Single Use Plastics Directive](https://gov.wales/) [Online]. Available at: <https://gov.wales/>

<sup>64</sup> Keep Britain Tidy (2018) [Litter in England: The local environmental quality survey of England 2017/18](https://www.keepbritaintidy.org) [Online]. Available at: <https://www.keepbritaintidy.org>

<sup>65</sup> INCPEN (2014) [Litter composition Survey of England](http://www.incpen.org) [Online]. Available at: [www.incpen.org](http://www.incpen.org)

<sup>66</sup> Zero Waste Scotland (2016) [Litter](http://www.zerowastescotland.org.uk) [Online]. Available at: [www.zerowastescotland.org.uk](http://www.zerowastescotland.org.uk)

- 10% of respondents had intentionally dropped litter in the 12 months prior to the survey being carried out;
- 26% of respondents had accidentally dropped litter and left it there in the 12 months prior to the survey being carried out;
- 86% of respondents had seen someone else drop litter (i.e. either intentionally or accidentally).

#### 6.2.2.2 Marine Litter

Alongside terrestrial litter, marine litter also has a negative impact on the economy, environment and society. This includes damage to marine wildlife as well as wider ecosystem deterioration, public health issues and impacts on the aesthetics of Scotland's landscape. There are also a wider range of economic impacts across industries that rely on Scotland's coastal and marine environment.

The Marine Conservation Society Great British Beach Clean 2017<sup>67</sup> identified that in Scotland beach litter rose by 6% in 2017 compared with 2016 in terms of the number of litter items identified. A total of 57,961 litter items were collected from 111 beaches, averaging 490 pieces of litter from every 100 metres cleaned, compared to 194 pieces of litter in 2013, an increase of approximately 250% in four years.

The Marine Conservation Society's latest data reveals that the littering of disposable items remains prevalent.

- Containers: Food (including fast food) = On average **2.3** per 100m of beach surveyed
- Cups = On average **1.7** per 100m of beach surveyed
- Cutlery/trays/straws = On average **5.8** per 100m of beach surveyed
- Plastic/polystyrene pieces (0-2.5cm) = On average **65** per 100m of beach surveyed
- Plastic/polystyrene pieces (2.5-50cm) = On average **34.9** per 100m of beach surveyed

The effects of marine litter on biodiversity are discussed in **Section 7**.

#### 6.2.3 Likely Evolution of the Baseline without the SUP Directive

The Scottish Government has shown a continued commitment to eliminate single-use plastics from our communities due to negative impacts on our wildlife. Although the number of companies who have switched to non-plastic alternatives has increased in recent years, single-use plastic is still seen as one of the key threats to marine and wildlife. Introducing market restrictions for the specified single-use plastic items will help to accelerate the transition to non-plastic alternatives.

There is some evidence that rates of littering may reduce in the long term, thanks to nationwide awareness campaigns and media shows such as Blue Planet and War on

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<sup>67</sup> Marine Conservation Society (2017) *Great British Beach Clean Report 2015* [Online]. Available at: [Error! Hyperlink reference not valid.](#)

Plastic with Hugh and Anita<sup>68</sup>. Nevertheless, data is not sufficient to establish this for certain. It should be noted too that this trend data does not directly equate to an effect on the landscape as the data does not identify the sensitivity of the receiving environment.

## 6.3 Consideration of Reasonable Alternatives

This section outlines the assessment of each single-use plastic item in scope against the scoped-in topic of landscape and visual impacts. Whilst the SEA legislation does not provide any definition of the term “landscape” or “visual impacts”, Scottish Natural Heritage (now NatureScot)<sup>69</sup> quote the definition of the European Landscape Convention in defining landscape as “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors”.

### 6.3.1 Methodology

Although all alternative options to the targeted single-use plastic products are also single-use and hence are expected to be discarded after use, market restrictions are expected to reduce the prevalence of marine litter as they will help inform consumers of the damage that could be caused by littering behaviour. Current estimates of single-use plastic litter are discussed in Section 6.2.2.

### 6.3.2 Results

The table below lists the contribution of each targeted single-use plastic item to the issue of littering in Scotland. The impact of littering non-plastic alternative options into terrestrial and marine environments is discussed below.

**Table 6-1 breakdown of single-use plastic litter by type.**

Measure No	Single-use plastic items in scope	Alternative option	Litter share (% by item)
1	Cutlery	Wooden Cutlery	1
2	Plates	Wax-coated Paper Plates	1
3	Beverage Stirrer	Wooden Stirrer	0.1
4	Straws	Wax-line paper straws	1.9
5	Balloon sticks	Cardboard balloon sticks	N/A

<sup>68</sup> Discover Wildlife (2020) [When is War on Plastic with Hugh and Anita on TV?](http://www.discoverwildlife.com) [Online]. Available at: [www.discoverwildlife.com](http://www.discoverwildlife.com)

<sup>69</sup> The Scottish Environment Protection Agency (2011) [The Scottish Strategic Environmental Assessment Review](http://www.nature.scot/) [Online]. Available at: [www.nature.scot/](http://www.nature.scot/)

<b>6</b>	Food containers made of expanded polystyrene	Wax-coated cardboard boxes	0.3 -0.5
<b>7</b>	Cups and beverage containers made of expanded polystyrene	Plastic-coated paper cups	0.14
<b>8</b>	Oxo-biodegradable HDPE	Conventional plastic	N/A

The key to each assessment score is shown below:

Score Key:	++	+	0	-	--	?
	Significant positive effect	Minor positive effect	No overall effect	Minor negative effect	Significant negative effect	Score uncertain
<p>NB: where more than one symbol is presented in a box it indicates that the SEA has found more than one score for the category. Where the scores are both positive and negative, the boxes are deliberately not coloured (i.e. 'no overall effect'). Where a box is coloured but also contains a "?" this indicates uncertainty over whether the effect could be a minor or significant effect although a professional judgement is expressed in the colour used. A conclusion of uncertainty arises where there is insufficient evidence for expert judgement to conclude an effect.</p>						

<b>Measure No 1</b>		
Material/item in scope	Plastic cutlery	
The alternative option	Wooden cutlery	
Notes:		
SEA criteria	Score	Commentary
Will the alternative option reduce the visual effects from littering of materials into terrestrial and marine environments and improve their scenic qualities?	<b>+/?</b>	<p>According to an analysis undertaken by DEFRA<sup>70</sup>, It is estimated that 1.5 – 4.5% of all global plastics production ends up in the oceans every year. These items are ingested by marine life (with potential knock-on effects further up the food chain), captured as marine debris in fishing equipment and washed up on beaches. The Marine Conservation Society has been monitoring the levels of cutlery/trays and straws found on beaches in the UK since 2004. Cutlery remains on the top 10 list of items that were found during the Great British Beach Clean 2017 with an average of 15.1 for every 100m of beach surveyed in 2017<sup>71</sup>.</p> <p>Assuming that plastic cutlery makes up half of the estimate made for cutlery/trays and straws <sup>72</sup>, we can attribute 1% of marine litter to plastic cutlery.</p> <p>The introduction of a market restriction on plastic cutlery is expected to reduce the prevalence of terrestrial and marine litter by helping to inform consumers of damage that could be caused by littering behaviour. This will consequently reduce the visual effects and improve their scenic qualities.</p>

<sup>70</sup> DEFRA (2018) Consultation Stage Impact Assessment on the proposal to ban the distribution and/or sale and of plastic drinking straws in England [Online]. Available at: <https://consult.defra.gov.uk/>

<sup>71</sup> Marine Conservation Society (2017) Great British Beach Clean [Online]. Available at: [www.mcsuk.org](http://www.mcsuk.org)

<sup>72</sup> Eunomia (2017) Leverage Points for Reducing Single-use Plastics [Online]. Available at: [www.seas-at-risk.org](http://www.seas-at-risk.org)

<b>Measure No 2</b>		
Material/item in scope	Plastics plates	
The alternative option	Wax-coated paper plates	
Notes:		
SEA criteria	Score	Commentary
Will the alternative option reduce the visual effects from littering of materials into terrestrial and marine environments and improve their scenic qualities?	<b>+/?</b>	<p>According to an analysis undertaken by DEFRA<sup>73</sup>, it is estimated that 1.5 – 4.5% of all global plastics production ends up in the oceans every year. These items are ingested by marine life (with potential knock-on effects further up the food chain), captured as marine debris in fishing equipment and washed up on beaches. The Marine Conservation Society has been monitoring the levels of cutlery/trays (including plates) and straws found on beaches in the UK since 2004. This category remains on the top 10 list of items that were found during the Great British Beach Clean 2019 with an average of 5.8 for every 100m of beach surveyed in 2019<sup>73</sup>. Assuming that plastic plates make half of the estimate made for cutlery/trays (including plates)<sup>74</sup>, we can attribute 1% of marine litter to plastic plates.</p> <p>The introduction of a market restriction on plastic cutlery is expected to reduce the prevalence of terrestrial and marine litter by helping to inform consumers of damage that could be caused by littering behaviour. This will consequently reduce the visual effects and improve their scenic qualities.</p>

<sup>73</sup> Marine Conservation Society (2019) personal communication

<sup>74</sup> Eunomia (2017) [Leverage Points for Reducing Single-use Plastics](http://www.seas-at-risk.org) [Online]. Available at: [www.seas-at-risk.org](http://www.seas-at-risk.org)

<b>Measure No 3</b>		
Material/item in scope	Plastic beverage stirrer	
The alternative option	Wooden stirrer	
Notes:		
SEA criteria	Score	Commentary
Will the alternative option reduce the visual effects from littering of materials into terrestrial and marine environments and improve their scenic qualities?	<b>+/?</b>	<p>According to an analysis undertaken by DEFRA<sup>75</sup>, It is estimated that 1.5 – 4.5% of all global plastics production ends up in the oceans every year. These items are ingested by marine life (with potential knock-on effects further up the food chain), captured as marine debris in fishing equipment and washed up on beaches. The Marine Conservation Society has been monitoring the levels of plastic and polystyrene pieces (0 – 50cm) (including stirrers) found on beaches in the UK since 2004. Polystyrene pieces continue to feature in the top ten, ranking first in most common marine litter items in beach clean surveys with an average of 225.3 for every 100m of beach surveyed in 2017<sup>76</sup>. Plastic stirrers contribute to these pieces as they are made of polystyrene.</p> <p>Research suggests that stirrers and straws together make up 2% of marine litter. Assuming stirrers make up 5% of the group of straws and stirrers<sup>77</sup>, we can attribute 0.1% of marine litter to plastic stirrers.</p> <p>The introduction of a market restriction on plastic cutlery is expected to reduce the prevalence of terrestrial and marine litter by helping to inform consumers of damage that could be caused by littering behaviour. This will consequently reduce the visual effects and improve their scenic qualities.</p>

<sup>75</sup> DEFRA (2018) Consultation Stage Impact Assessment on the proposal to ban the distribution and/or sale and of plastic drinking straws in England [Online]. Available at: <https://consult.defra.gov.uk/>

<sup>76</sup> Marine Conservation Society (2017) Great British Beach Clean [Online]. Available at: [www.mcsuk.org](http://www.mcsuk.org)

<sup>77</sup> According to a study carried out by Resource Futures in 2018, “Preliminary assessment of the economic, environmental and social impacts of a potential ban on plastic straws, plastic stem cotton buds and plastic drink stirrers”, estimates for the number of stirrers and straws consumed in England vary, and so we have assumed stirrers makeup 2.5% of the total of straws for our high estimate, 5% in our central estimate and 10% for our low estimate for straw prevalence.

Measure No 4		
Material/item in scope	Plastic straws	
The alternative option	Wax-lined paper straws	
Notes:		
SEA criteria	Score	Commentary
Will the alternative option reduce the visual effects from littering of materials into terrestrial and marine environments and improve their scenic qualities?	+/?	<p>According to an analysis undertaken by DEFRA<sup>78</sup>, It is estimated that 1.5 – 4.5% of all global plastics production ends up in the oceans every year. These items are ingested by marine life (with potential knock-on effects further up the food chain), captured as marine debris in fishing equipment and washed up on beaches. The Marine Conservation Society has been monitoring the levels of cutlery/trays and straws found on beaches in the UK since 2004. Cutlery, trays and straws remain on the top 10 list of items that were found during the Great British Beach Clean 2019 with an average of 5.8 for every 100m of beach surveyed in 2019<sup>79</sup>.</p> <p>DEFRA research indicates that stirrers and straws together make up 2% of marine litter. Assuming straws make up 95% of the group of straws and stirrers<sup>80</sup>, we can attribute 1.9% of marine letter to plastic straws.</p> <p>The introduction of a market restriction on plastic cutlery is expected to reduce the prevalence of terrestrial and marine litter by helping to inform consumers of damage that could be caused by littering behaviour. This will consequently reduce the visual effects and improve their scenic qualities.</p>

<sup>78</sup> DEFRA (2018) [Consultation Stage Impact Assessment on the proposal to ban the distribution and/or sale and of plastic drinking straws in England](https://consult.defra.gov.uk/) [Online]. Available at: <https://consult.defra.gov.uk/>

<sup>79</sup> Marine Conservation Society (2019) personal communication.

<sup>80</sup> According to a study carried out by [Resource Futures in 2018](#), “Preliminary assessment of the economic, environmental and social impacts of a potential ban on plastic straws, plastic stem cotton buds and plastic drink stirrers”, estimates for the number of stirrers and straws consumed in England vary, and so we have assumed stirrers makeup 2.5% of the total of straws for our high estimate, 5% in our central estimate and 10% for our low estimate for straw prevalence.

<b>Measure No 5</b>		
Material/item in scope	Plastic balloon sticks	
The alternative option	Cardboard balloon sticks	
Notes:		
SEA criteria	Score	Commentary
Will the alternative option reduce the visual effects from littering of materials into terrestrial and marine environments and improve their scenic qualities?	<b>+/?</b>	<p>According to an analysis undertaken by DEFRA<sup>81</sup>, It is estimated that 1.5 – 4.5% of all global plastics production ends up in the oceans every year. These items are ingested by marine life (with potential knock-on effects further up the food chain), captured as marine debris in fishing equipment and washed up on beaches.</p> <p>There are no estimates on the amount of plastic balloon sticks littered across Scotland. However, we do expect the litter rate to be substantially lower than other single-use plastic items such as plastic straws and stirrers.</p> <p>The introduction of a market restriction on plastic cutlery is expected to reduce the prevalence of terrestrial and marine litter by helping to inform consumers of damage that could be caused by littering behaviour. This will consequently reduce the visual effects and improve their scenic qualities.</p>

<sup>81</sup> DEFRA (2018) [Consultation Stage Impact Assessment on the proposal to ban the distribution and/or sale and of plastic drinking straws in England](https://consult.defra.gov.uk/) [Online]. Available at: <https://consult.defra.gov.uk/>

<b>Measure No 6</b>		
Material/item in scope	Food containers made of expanded polystyrene	
The alternative option	Wax-coated cardboard boxes	
Notes:		
SEA criteria	Score	Commentary
Will the alternative option reduce the visual effects from littering of materials into terrestrial and marine environments and improve their scenic qualities?	<b>+/?</b>	<p>According to an analysis undertaken by DEFRA<sup>68</sup>, it is estimated that 1.5 – 4.5% of all global plastics production ends up in the oceans every year. These items are ingested by marine life (with potential knock-on effects further up the food chain), captured as marine debris in fishing equipment and washed up on beaches. The Marine Conservation Society has been monitoring the levels of plastic and polystyrene pieces (0 – 50cm) (including expanded polystyrene) found on beaches in the UK since 2004. Polystyrene pieces continue to feature in the top ten, ranking first in most common marine litter items in beach clean surveys with an average of 225.3 for every 100m of beach surveyed in 2017<sup>82</sup>.</p> <p>The Marine Conservation Society estimates that fast food packaging constituted around 0.6% of all marine litter in 2019. The MCS estimate includes all types of packaging materials (not only EPS) so we expect the amount of food containers made of EPS littered to range between 0.3%-0.5%.</p> <p>The introduction of a market restriction on plastic cutlery is expected to reduce the prevalence of terrestrial and marine litter by helping to inform consumers of damage that could be caused by littering behaviour. This will consequently reduce the visual effects and improve their scenic qualities.</p>

<sup>82</sup> Marine Conservation Society (2017) [Great British Beach Clean](http://www.mcsuk.org) [Online]. Available at: [www.mcsuk.org](http://www.mcsuk.org)

<b>Measure No 7</b>		
Material/item in scope	Cups and beverage containers made of expanded polystyrene <sup>83</sup>	
The alternative option	Plastic-coated paper cups	
Notes:		
SEA criteria	Score	Commentary
Will the alternative option reduce the visual effects from littering of materials into terrestrial and marine environments and improve their scenic qualities?	<b>+/?</b>	<p>According to an analysis undertaken by DEFRA<sup>84</sup>, It is estimated that 1.5 – 4.5% of all global plastics production ends up in the oceans every year. These items are ingested by marine life (with potential knock-on effects further up the food chain), captured as marine debris in fishing equipment and washed up on beaches. The Marine Conservation Society has been monitoring the levels of cutlery (including cups) found on beaches in the UK since 2004. This category which includes cups remains on the top 10 list of items that were found during the Great British Beach Clean 2017 with an average of 15.1 for every 100m of beach surveyed in 2017<sup>85</sup>.</p> <p>Our analysis suggests that EPS cups littered in Scotland accounts for 0.14% of dropped litter waste by item count (Section 6.2.2.1). While EPS cups are highly likely to be replaced by plastic-coated paper cups following the introduction of proposed measures.</p> <p>The introduction of a market restriction on EPS cups is expected to reduce the prevalence of terrestrial and marine litter by helping to inform consumers of damage that could be caused by littering behaviour. This will consequently reduce the visual effects and improve their scenic qualities.</p>

<sup>83</sup> This category covers both item 8 and 9 listed in part B of the Directive's Annex: Beverage containers made of expanded polystyrene, including their caps and lids, and Cups for beverages made of expanded polystyrene, including their covers and lids.

<sup>84</sup> DEFRA (2018) Consultation Stage Impact Assessment on the proposal to ban the distribution and/or sale of plastic drinking straws in England [Online]. Available at: <https://consult.defra.gov.uk/>

<sup>85</sup> Marine Conservation Society (2017) Great British Beach Clean [Online]. Available at: [www.mcsuk.org](http://www.mcsuk.org)

<b>Measure No 8</b>		
Material/item in scope	Oxo-degradable HDPE	
The alternative option	Conventional HDPE	
Notes:		
SEA criteria	Score	Commentary
Will the alternative option reduce the visual effects from littering of materials into terrestrial and marine environments and improve their scenic qualities?	<b>0</b>	We do not expect significant change when switching from Oxo-degradable to conventional HDPE carrier bags as both items are single-use and not widely recycled in Scotland.

## 6.4 Mitigation and Enhancement

No mitigation measures have been identified under this category.

## 7. Biodiversity

**NatureScot<sup>86</sup> defines biodiversity as “all living things; the plants, animals and insects in our forests, mountains, rivers, seas, gardens and parks, right down to the things living in our soils”.**

**This section provides the contextual information to inform the assessment (in terms of the review of Plans, Programmes and Strategies (PPS) and the baseline information) as well as an assessment of the effects of the proposed market restrictions regarding biodiversity impacts.**

### 7.1 Relationship with other Plans, Programmes and Strategies and Environmental Objectives

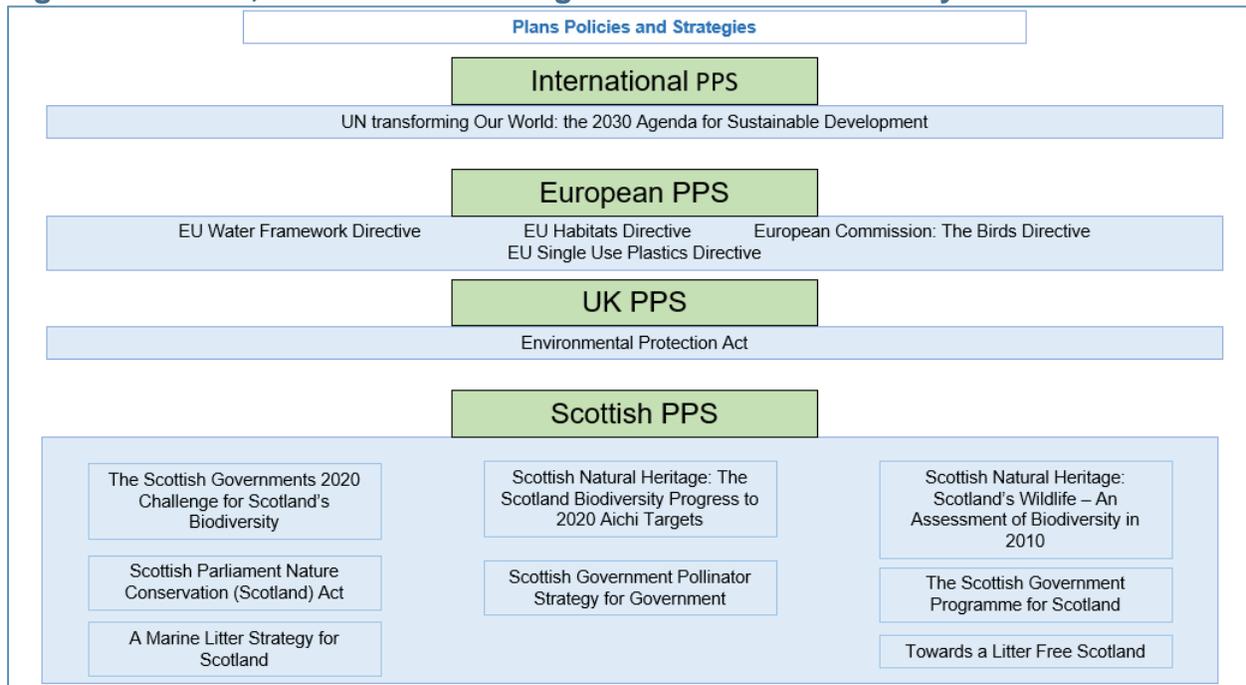
The PPS that are relevant to the landscape and visual impact topic that have been reviewed to inform the assessment exercise are shown in **Figure 7-1** and summarised thereafter.

For the purposes of the review of the international plans and programmes for this SEA, it is assumed that the broad objectives of extant European Union (EU) legislation will be maintained once the UK has withdrawn from the EU and that similar or equivalent environmental protections will remain in place.

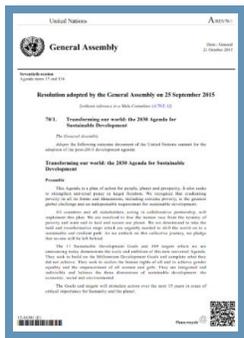
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<sup>86</sup> Scottish Natural Heritage (2013) [Biodiversity and Geodiversity Considerations in Strategic Environmental Assessment](http://www.nature.scot) [Online]. Available at: [www.nature.scot](http://www.nature.scot)

**Figure 7-1 Plans, Policies and Strategies related to biodiversity**



The relationship between the identified PPSs and the restriction of single-use plastic items placed on the Scottish market are outlined below.



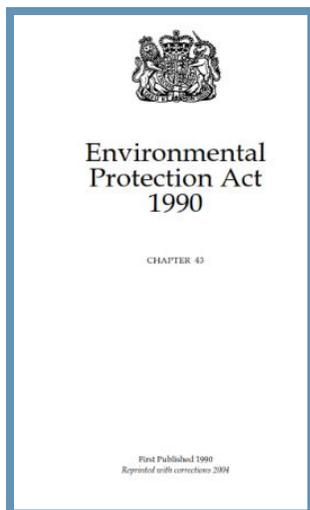
**United Nations (2015): Transforming our World - the 2030 Agenda for Sustainable Development** sets out 17 global goals agreed by the United Nations. The goals of the Agenda are outlined in Section 5.1 (above). With respect to biodiversity specifically, Goal 15 emphasises the need to protect, restore and promote sustainable use of terrestrial ecosystems; to sustainably manage forests, combat desertification, and to halt and reverse land degradation and biodiversity loss.

**European Commission: The EU Water Framework Directive (2000)** replaces seven previous Directives and seeks to protect the water habitats in lakes, rivers, groundwater and coastal beaches and aims to restore polluted waterways. The Directive introduces new ways of protecting and improving bodies of water to maximise environmental outcomes. Protection of the marine habitat of Scotland is a key concern and influencing factor in the restriction of single-use plastic items on the Scottish market, in that it will

limit the prevalence and subsequent damage caused by slow-degrading and harmful plastic waste in the seas and waterways of Scotland.

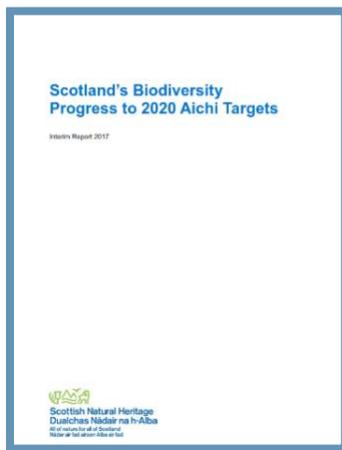
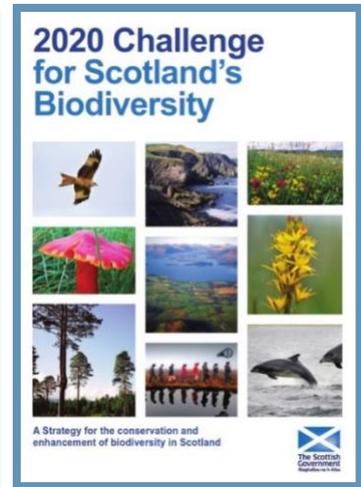
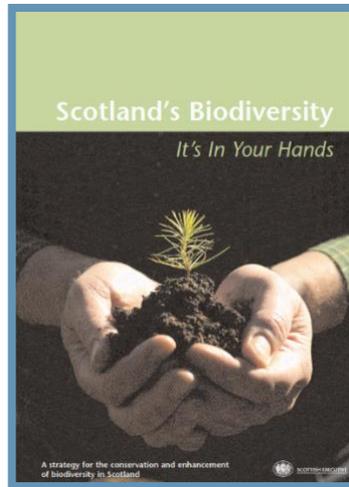
The **Habitats Directive (92/43/EEC)** and **Birds Directive (2009/147/EC)** include measures to maintain or restore important natural habitats and species including through the designation of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). These Directives are transposed into UK law through a number of regulations and planning policy documents.

**European Union (2019): Directive on the reduction of the impact of certain plastic products on the environment** highlights significant negative environmental, health and economic impacts stemming from the continued use of certain plastic products. The aims and provisions of this Directive are outlined in Section 4.1 (above). In the context of Biodiversity, the directive calls for a significant reduction in waste, and specifically plastic waste, whose leakage into the environment is proven to have severe detrimental effects on the flora and fauna of Scotland. Restricting such materials in Scotland would therefore drive a significant reduction in plastic waste and its associated harm to the environment.



**UK Government (1990): The Environmental Protection Act** seeks to improve resource use and environmental conditions through the control of waste collections and management across the UK. The main provisions of the Act are outlined in Section 5.1 (above) The Act requires the UK to tightly control the movement and handling of wastes. The restriction of single-use plastic items placed onto the Scottish market could improve both environmental and ecological performance by reducing the overall amount and complexity of plastics entering the system.

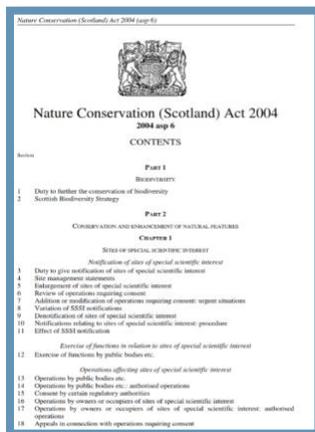
**Scottish Parliament: The Scottish Biodiversity Strategy (2004)** was supplemented by **The Scottish Government's 2020 Challenge for Scotland's Biodiversity (2013)** document; both of which combine to form the **Scottish Biodiversity Strategy**. The aims of the 2020 challenge were to sustain and enhance the ecosystems on both land and at sea so as to maximise benefits to Scotland through natural diversity and economic growth. Progress is measured using the **Scottish Biodiversity Strategy Indicators**. The strategy brings together public bodies (SEPA, NatureScot, Local Authorities etc) to restore and regenerate ecosystem health across Scotland. The documents note that air, water and soil quality have declined over the last 60 years in Scotland and that sweeping reform is needed to reverse this trend. Restriction of the specified single-use plastic items on the Scottish market will have the effect of reducing plastic waste leaching into the environs of Scotland, thus mitigating negative effects of plastic waste on its biodiversity.



**Scottish Natural Heritage: The Scotland Biodiversity Progress to 2020 Aichi Targets (2017)** This progress report remains the most up to date regarding the 2020 targets noted above and demonstrates Scotland's progress toward 20 global targets set by the UN Convention on Biological Diversity. Of the 20 targets Scotland was noted as being on track for 7 and showing progress on 12 but requiring action. Only 1 target was noted as being at risk; wherein progress is moving away from the target. Of note, Scotland is considered a "world leader" in developing the concept of natural capital and integrating biological values in strategies and policies. In contrast, the 2017 report illustrated that at that time, indicators showed that progress

to ensure sustainable consumption and production was lagging. The restriction of single-use plastic items placed on the Scottish market is evidence that this lag is being addressed.

**Scottish Natural Heritage (2010): Scotland's Wildlife – An assessment of biodiversity in 2010** reported that of 8 priority coastal and marine habitats appraised, 38% were recorded as declining. In woodlands, 28% of 31 priority species were declining, while assessments on upland species demonstrated declining numbers across the board. Overall, across Scotland, 31% of priority habitats were declining whilst 41% were improving. The assessment concluded Scotland was on target in respect of 22 actions as of 2010, with 9 requiring improvement and 6 not on target. The market restriction of specified single-use plastic items will assist in the protection of Scottish biodiversity by reducing demand for virgin materials and better protecting habitats through reduced incidences of harmful plastic littering.



### **Scottish Parliament (2004) Nature Conservation**

**(Scotland) Act** aims to conserve biodiversity and habitats across Scotland. It requires public bodies and officeholders to consider the effect of their actions at a local, regional, national and international level through a new general duty. The Act extends the laws surrounding:

- Sites of Special Scientific Interest (SSSIs), of which Scotland now has over 1,400 covering around 1,011,000 hectares or 12.6% of Scotland's land area<sup>87</sup>
- Animals by promoting stewardship of individual species as well as the overarching diversity of the habitats
- Regulation of land management operations.

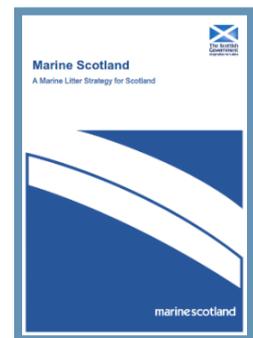
<sup>87</sup> NatureScot (2020) Sites of Special Scientific Interest [Online]. Available at: [www.nature.scot/](http://www.nature.scot/)

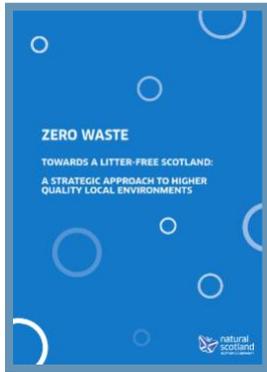
**Scottish Government (2017) Pollinator Strategy for Scotland** is the Government's strategy to manage the threats to pollinators from land use, habitat fragmentation, disease and pesticide. The strategy aims to “address the causes of decline in populations, diversity and range of our pollinator species and to help them thrive into the future”. By 2027, the strategy intends to embed support for pollinators into strategies and policies across the public sector, improve understanding of pollinators and to regulate imports of species to minimise disease. Restricting single-use plastic items placed on the market in Scotland may support the pollinator strategy in preserving habitats and biodiversity through reductions in harmful plastic litter.



**Scottish Government (2020): The Scottish Government Programme for Government (2020-21)** states the Government's commitment to tackle climate change and to prepare Scotland for the new, low carbon world. The main objectives of the Programme are outlined in Section 4.1 (above). The programme protects Scotland's biodiversity by providing Police Scotland with new resources to tackle wildlife crime, to establish independent groups to manage grouse moors and to explore management of deer populations. The programme will develop the Central Scotland Green Network – Europe's largest greenspace project including 25 pollinator projects.

**Scottish Government (2014): A Marine Litter Strategy for Scotland** identified five proposed strategic directions to reach a zero waste Scotland, supported by responsible behaviours. The main aims of the Strategy are outlined in Section 5.1 (above). The strategy notes the harm posed to the marine environment from marine litter. As widely publicised, marine species are known to ingest large quantities of plastics that can cause severe damage. Limiting the generation of marine plastics will significantly decrease the impact that plastic waste can have on the wildlife of Scotland and beyond.





**Scottish Government (2014): Toward a Litter free Scotland - The National Litter Strategy** sets clear actions which have an impact upon material assets, when seeking to improve the environment through targeted approaches to litter and fly-tipping. The main aims of the Strategy are outlined in Section 5.1 (above). With specific reference to biodiversity, the restriction of single-use plastics will support the outcomes of this Strategy by stimulating the design of more sustainable products with higher reuse potential, replacing those single-use plastic products that are so often littered, and which have severely detrimental properties within the context of flora and fauna of Scotland.

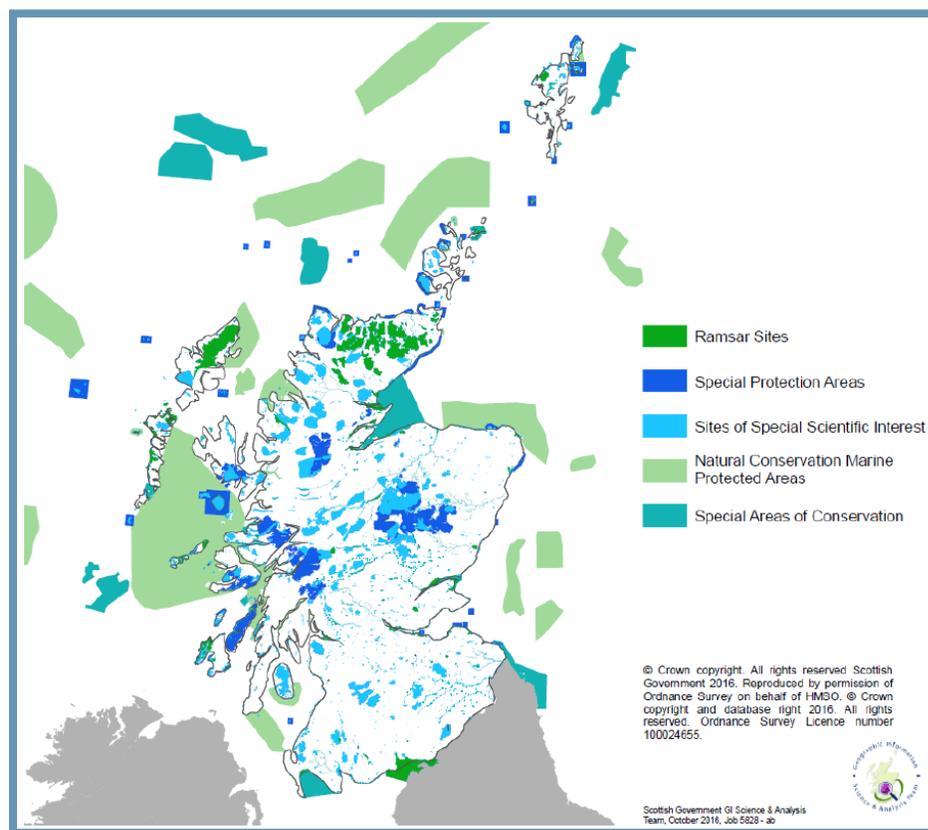
## 7.2 Baseline Characteristics

This section of the Environmental Report identifies and characterises current environmental baseline conditions for biodiversity, flora and fauna. This baseline highlights designated nature conservation sites, for example Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Sites of Special Scientific Importance (SSSIs), Ancient Woodlands, Marine Protected Areas and Ramsar (wetland) Sites. It considers current pollution of terrestrial, coastal and marine environments and the effect this has on these ecosystems, including species and habitats, and their interactions.

### 7.2.1 Designated Conservation Sites

Designated sites, including Ramsar, SPAs, SACs and SSSI sites protect flora, fauna, geological or physiographical features of outstanding quality in terrestrial and coastal environments. **Figure 7-2** identifies the designated nature conservation areas in Scotland.

**Figure 7-2 Map of Nature Conservation Areas in Scotland. Source: The Scottish Government (2016) Key Scottish Environment Statistics**



There are also additional areas out with the area shown on the map (65% of Special Areas of Conservation and 71% of Nature Conservation Marine Protected Areas are located outside the area pictured)<sup>88</sup>.

Designated nature conservation areas in the Scotland include:

- 152 SPAs, covering an area of 1,205,368 hectares (in addition to one site which straddles the border with England and is included under the England section above)<sup>89</sup>;
- 236 SACs covering an area of 2,289,782 hectares (in addition to three sites that straddle the border with England and are included under the England section above)<sup>90</sup>;

<sup>88</sup> The Scottish Government (2016) Key Scottish Environment Statistics [Online]. Available at: [www.gov.scot](http://www.gov.scot)

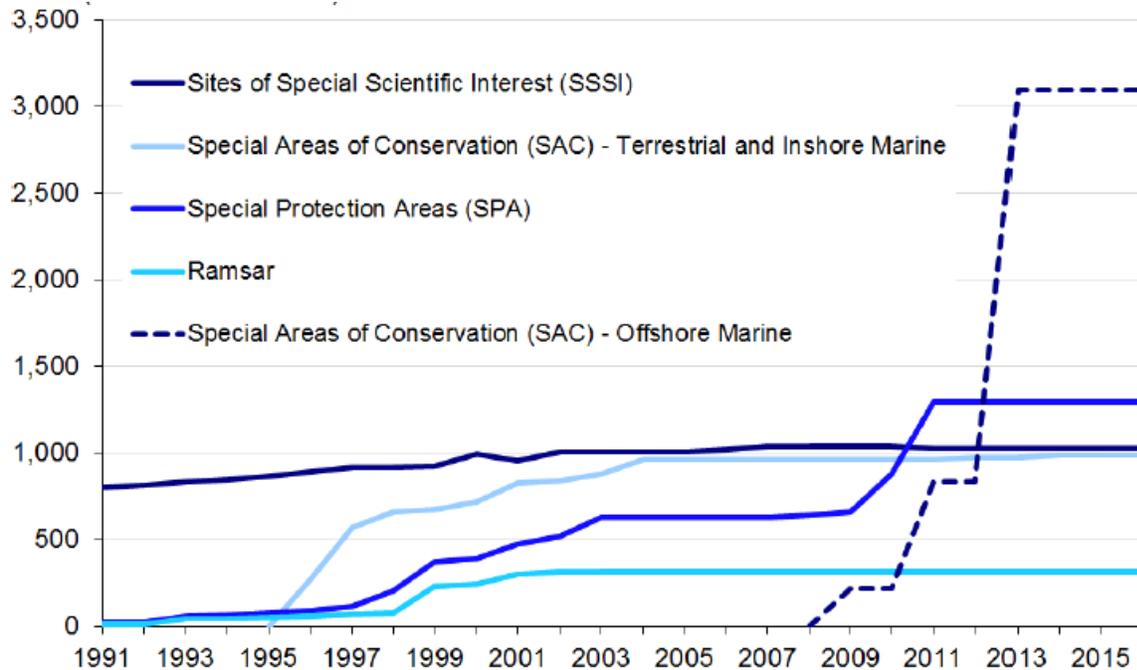
<sup>89</sup> Joint Nature Conservancy Committee (2018) UK Protected Sites [Online]. Available at: <https://jncc.gov.uk/>

<sup>90</sup> Joint Nature Conservation Committee (2019) Special Areas of Conservation [Online]. Available at: <https://jncc.gov.uk/>

- 50 Ramsar sites covering a total area of 283,083 hectares (in addition to one site which straddles the border with England and is included under the England section above)<sup>91</sup>; and
- As of February 2014, 1,425 SSSIs covering 1,020,000 hectares (13% of Scotland<sup>92</sup>).

**Figure 7-3** demonstrates the growth of designated areas within Scotland between 1991 and 2016.

**Figure 7-3 Designated areas: 1991-2016 (Areas thousand hectares). Source: Scottish Natural Heritage (2017) Site of Special Scientific Interest**



**Figure 7-4** below shows the condition of designated sites from 2005 and 2018<sup>93</sup>. In 2018 this was assessed as:

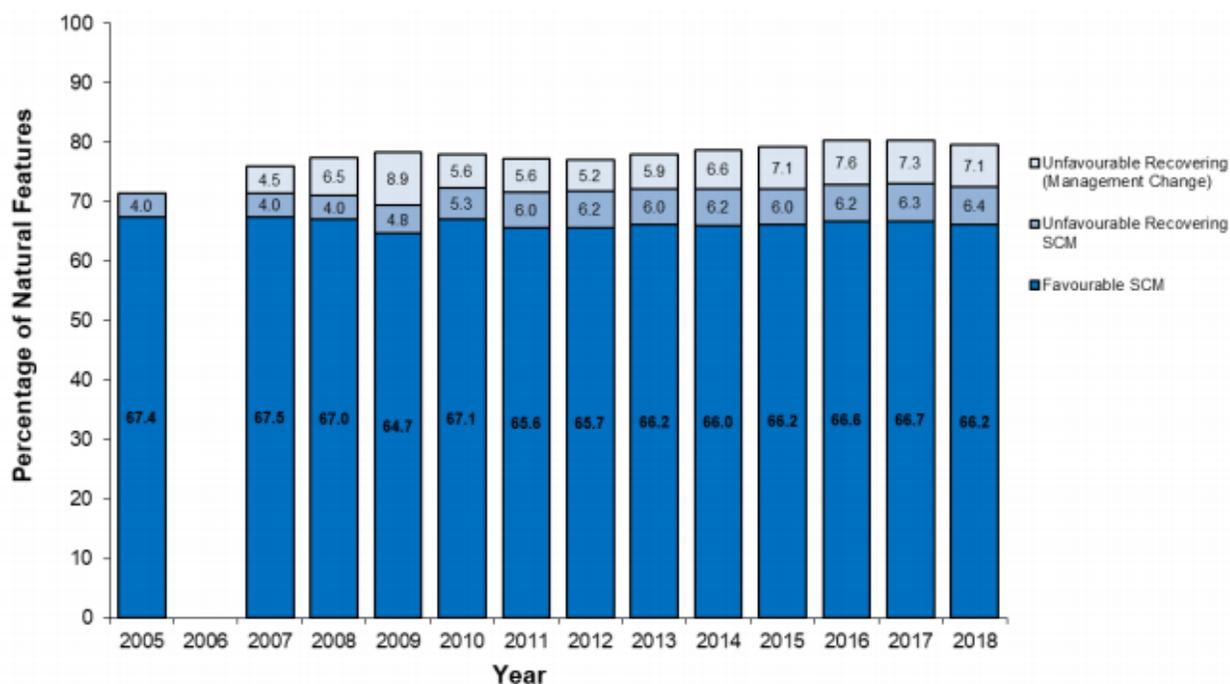
- Favourable: 66.2%
- Unfavourable Recovering: 6.4%
- Unfavourable Recovering Due to Management Change: 7.1%

<sup>91</sup> Joint Nature Conservation Committee (2019) UK Ramsar Sites [Online]. Available at: <https://jncc.gov.uk/>

<sup>92</sup> Scottish Government (2017) Site of Special Scientific Interest [Online]. Available at: <https://data.gov.uk/>

<sup>93</sup> NatureScot (2018) The Proportion of Scotland's Protected Sites in Favourable Condition 2018 [Online]. Available at: [www.nature.scot/](http://www.nature.scot/)

Figure 7-4 Condition of designated sites rom 2005-2018



The reasons for unfavourable conditions are numerous, reflecting the range of sites designated, and include:

- Water Pollution from agriculture/run off;
- Undergrazing;
- Inappropriate scrub control;
- Invasive species;
- Forestry and woodland management;
- Moor burning;
- Water pollution from point discharges;
- Public access/disturbance;
- Coastal squeeze.

### 7.2.2 Pollution of environments and ecosystems

Single-use plastic items account for much of the plastic that ends up in the sea, as these items are lightweight and easily blown into streams and rivers which end up in the ocean. As discussed in Section 6, the Marine Conservation Society Great British Beach Clean 2017<sup>94</sup> identified that in Scotland beach litter rose by 6% in 2017 compared with 2016 in terms of the number of litter items identified. A total of 57,961 litter items were collected from 111 beaches, averaging 490 pieces of litter from every 100 metres cleaned, compared to 194 pieces of litter in 2013; an increase of approximately 250% in four years.

<sup>94</sup> Marine Conservation Society (2017) [Great British Beach Clean](http://www.mcsuk.org) [Online]. Available at: [www.mcsuk.org](http://www.mcsuk.org)

It is estimated that 267 species are affected by marine litter globally, and specifically 86% of all sea turtle species, 44% of seabird species and 43% of marine mammal species are affected. Plastic litter is estimated to lead to the mortality; either directly or indirectly; of one million seabirds, 100,000 marine mammals, including 30,000 seals and 100,000 turtles, globally every year either through entanglement or ingestion.”<sup>95</sup> Marine plastics cause visible pollution, take centuries to break down and spread persistent toxic chemicals. When exposed to salt water and ultraviolet light these items can fragment into “microplastics” small enough to be mistakenly eaten by fish and other marine wildlife<sup>[Obj.]</sup>. This has knock on effects further up the food chain as the deleterious and toxic materials are effectively concentrated through each trophic level.

Numerous studies have also highlighted the adverse impacts of plastic-based terrestrial litter on terrestrial animals and birds<sup>96</sup>. Studies suggest that animals and birds can suffer from various forms of entanglement as well as accidental consumption of plastic which may – directly or indirectly - lead to the death of affected animals.

### 7.3 Likely Evolution of the Baseline without the SUP Directive

The 2019 review<sup>97</sup> of UK Biodiversity Indicators comprises 51 measures, of which five are not assessed in the long term and eight are not assessed in the short term. Of the 46 long-term measures, 24 show an improvement, compared to 14 of the measures that were deteriorating. Of the 43 short term measures, 18 show an improvement, as compared to 10 in decline. Measures that improved or deteriorated in the short term have not necessarily continued to improve or deteriorate respectively in the long term.

Measures showing long-term deterioration include: pressure from invasive species, parasites and pathogens reflecting a pattern of continuing or growing threat to biodiversity in the UK; status of UK priority species; birds of the wider countryside and at sea; insects in the wider countryside (e.g. butterflies); animal genetic resources, and the status of pollinating insects.

In the absence of market restrictions on the specified single-use plastic items and oxo-degradable plastics, it is anticipated that the amount of single-use plastics would still likely decline, as a number of major players in the retail and hospitality sector have already committed to alternatives<sup>98</sup>. However, the pace at which companies are eliminating single-use plastics is relatively slow.

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<sup>95</sup> Scottish Government (2012) [Marine Litter Issues, Impacts and Actions](https://www.gov.scot/) [Online]. Available at: <https://www.gov.scot/>

<sup>96</sup> One Green Planet (2015) [5 Ways Plastic Pollution Impacts Animals on Land](http://www.onegreenplanet.org) [Online]. Available at: [www.onegreenplanet.org](http://www.onegreenplanet.org)

<sup>97</sup> DEFRA (2019) [UK Biodiversity Indicators 2019 Revised](http://data.jncc.gov.uk/) [Online]. Available at: <http://data.jncc.gov.uk/>

<sup>98</sup> BBC (2019) [Plastic straws: Which companies are banning them?](http://www.bbc.co.uk) [Online]. Available at: [www.bbc.co.uk](http://www.bbc.co.uk)

## 7.4 Consideration of Reasonable Alternatives

### 7.4.1 Methodology

Although all alternative options to the specified single-use plastic items are also single-use and hence would also likely be discarded after one use, market restrictions are expected to reduce the prevalence of litter which has adverse effects on marine and terrestrial environments. Current estimates of single-use plastic litter are discussed in Section 6.2.2.

### 7.4.2 Results

**Table 7-1** lists the contribution of each targeted single-use plastic item to the issue of littering in Scotland. We expect non-plastic single-use alternatives will decompose naturally with no negative effect on biodiversity at terrestrial sites of importance for nature conservation, including in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter. The tables below provide a detailed assessment of the likely significant environmental effects of introducing market restrictions to the in-scope single-use plastic items and the corresponding reasonable alternatives.

Table 7-1 breakdown of single-use plastic litter by type.

Measure No	Single-use plastic items in scope	Alternative option	Litter share (% by item)
1	Cutlery	Wooden Cutlery	1
2	Plates	Wax-coated Paper Plates	1
3	Beverage Stirrer	Wooden Stirrer	0.1
4	Straws	Wax-line paper straws	1.9
5	Balloon sticks	Cardboard balloon sticks	N/A
6	Food containers made of expanded polystyrene	Wax-coated cardboard boxes	0.3 -0.5
7	Cups and beverage containers made of expanded polystyrene	Plastic-coated paper cups	0.14
8	Oxo-biodegradable HDPE	Conventional plastic	N/A

The key to each assessment score is shown below.

Score	++	+	0	-	--	?
Key:	Significant positive effect	Minor positive effect	No overall effect	Minor negative effect	Significant negative effect	Score uncertain
<p>NB: where more than one symbol is presented in a box it indicates that the SEA has found more than one score for the category. Where the scores are both positive and negative, the boxes are deliberately not coloured (i.e. 'no overall effect'). Where a box is coloured but also contains a "?" this indicates uncertainty over whether the effect could be a minor or significant effect although a professional judgement is expressed in the colour used. A conclusion of uncertainty arises where there is insufficient evidence for expert judgement to conclude an effect.</p>						

<b>Measure No 1</b>		
Material/item in scope	Plastics cutlery	
The alternative option	Wooden cutlery	
Notes:		
SEA criteria	Score	Commentary
Will it protect and/or enhance designated nature conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?	<b>+/?</b>	Introducing market restrictions on plastic cutlery might incentivise a reduction in litter. The alternative option (wooden cutlery) – if littered inappropriately – will decompose naturally and hence will not have a negative effect on biodiversity at terrestrial sites of importance for nature conservation, in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter. Overall, wooden cutlery is not deemed to cause the same level of harm to designated nature conservation sites as plastic cutlery.
Will it support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions?	<b>+/?</b>	When compared to single-use plastic cutlery, it is anticipated that wooden cutlery will have no adverse impacts on terrestrial and marine ecosystems and hence support the protection and enhancement of these areas. However, for the reasons discussed in Section 7.2.2, the significance of the effect on marine environments is to some extent uncertain.
Will it help avoid pollution of the terrestrial, coastal and marine environments?	<b>+/?</b>	It is anticipated that the alternative option would help reduce the risk of pollution (associated with littering) of terrestrial and marine ecosystems. For the reasons discussed in Section 7.2.2, the significance of the effect on marine environments is to some extent uncertain.

<b>Measure No 2</b>		
Material/item in scope	Plastics plates	
The alternative option	Wax-coated paper plates	
Notes:		
SEA criteria	Score	Commentary
Will it protect and/or enhance designated nature conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?	<b>+/?</b>	Introducing market restrictions on plastic plates might incentivise a reduction in litter. The alternative option (paper plates) – if littered inappropriately – will decompose naturally and hence will not have a negative effect on biodiversity at terrestrial sites of importance for nature conservation, in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter. Overall, wax-coated paper plates – if littered inappropriately – are not deemed to cause the same level of harm to designated nature conservation sites as plastic plates.
Will it support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions?	<b>+/?</b>	When compared to single-use plastic plates, it is anticipated that wax-coated paper plates will have no adverse impacts on terrestrial and marine ecosystems and hence support the protection and enhancement of these areas. However, for the reasons discussed in Section 7.2.2, the significance of the effect on marine environments is to some extent uncertain.
Will it help avoid pollution of the terrestrial, coastal and marine environments?	<b>+/?</b>	It is anticipated that the alternative option would help reduce the risk of pollution (associated with littering) of terrestrial and marine ecosystems. For the reasons discussed in Section 7.2.2, the significance of the effect on marine environments is to some extent uncertain.

<b>Measure No 3</b>		
Material/item in scope	Plastic beverage stirrer	
The alternative option	Wooden stirrer	
Notes:		
SEA criteria	Score	Commentary
Will it protect and/or enhance designated nature conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?	<b>+/?</b>	Introducing market restrictions on single-use plastic stirrers might incentivise a reduction in litter. The alternative option (wooden stirrers) – if littered inappropriately – will decompose naturally and hence will not have a negative effect on biodiversity at terrestrial sites of importance for nature conservation, in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter. Overall, wooden stirrers – if littered inappropriately – are not deemed to cause the same level of harm to designated nature conservation sites as a plastic stirrer.
Will it support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions?	<b>+/?</b>	When compared to single-use plastic stirrers, it is anticipated that wooden stirrers will have no adverse impacts on terrestrial and marine ecosystems and hence support the protection and enhancement of these areas. However, for the reasons discussed in Section 7.2.2, the significance of the effect on marine environments is to some extent uncertain.
Will it help avoid pollution of the terrestrial, coastal and marine environments?	<b>+/?</b>	It is anticipated that the alternative option would help reduce the risk of pollution (associated with littering) of terrestrial and marine ecosystems. For the reasons discussed in Section 7.2.2, the significance of the effect on marine environments is to some extent uncertain.

<b>Measure No 4</b>		
Material/item in scope	Plastic straws	
The alternative option	Wax-lined paper straws	
Notes:		
SEA criteria	Score	Commentary
Will it protect and/or enhance designated nature conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?	<b>+/?</b>	Introducing market restrictions on single-use plastic straws might incentivise a reduction in litter. The alternative option (waxed-lined paper straw) – if littered inappropriately – will decompose naturally (assuming the wax coated material is compostable) and hence will not have the same level of negative effect on biodiversity at terrestrial sites of importance for nature conservation, in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter. Overall, paper straws – if littered inappropriately – are not deemed to cause the same level of harm to designated nature conservation sites as plastic straws.
Will it support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions?	<b>+/?</b>	When compared to single-use plastic straws, it is anticipated that wax-lined paper straws will have no adverse impacts on terrestrial and marine ecosystems and hence support the protection and enhancement of these areas. However, for the reasons discussed in Section 7.2.2, the significance of the effect on marine environments is to some extent uncertain.
Will it help avoid pollution of the terrestrial, coastal and marine environments?	<b>+/?</b>	It is anticipated that the alternative option would help reduce the risk of pollution (associated with littering) of terrestrial and marine ecosystems. For the reasons discussed in Section 7.2.2, The significance of the effect on marine environments is to some extent uncertain.

<b>Measure No 5</b>		
Material/item in scope	Plastic balloon sticks	
The alternative option	Cardboard balloon sticks	
Notes:		
SEA criteria	Score	Commentary
Will it protect and/or enhance designated nature conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?	<b>+/?</b>	Introducing market restrictions on plastic balloon sticks might incentivise a reduction in litter. The alternative option (cardboard balloon sticks) – if littered inappropriately – will decompose naturally and hence will not have the same level of negative effect on biodiversity at terrestrial sites of importance for nature conservation, in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter. Overall, cardboard sticks – if littered inappropriately – are not deemed to cause the same level of harm to designated nature conservation sites as plastic balloon sticks.
Will it support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions?	<b>+/?</b>	When compared with single-use plastic balloon sticks, it is anticipated that cardboard balloon sticks will have no adverse impacts on terrestrial and marine ecosystems and hence support the protection and enhancement of these areas. However, for the reasons discussed in Section 7.2.2, the significance of the effect on marine environments is to some extent uncertain.
Will it help avoid pollution of the terrestrial, coastal and marine environments?	<b>+/?</b>	It is anticipated that the alternative option would help reduce the risk of pollution (associated with littering) of terrestrial and marine ecosystems. For the reasons discussed in Section 7.2.2, the significance of the effect on marine environments is to some extent uncertain.

Measure No 6		
Material/item in scope:	Food containers made of expanded polystyrene	
The alternative option	Wax-coated cardboard boxes	
Notes:		
SEA criteria	Score	Commentary
Will it protect and/or enhance designated nature conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?	<b>+/?</b>	Introducing market restrictions on EPS food containers might incentivise a reduction in litter. The alternative option (wax-coated cardboard boxes) – if littered inappropriately – will decompose naturally (assuming that any coated material is made from compostable material) and hence will not have the same level of negative effect on biodiversity at terrestrial sites of importance for nature conservation, in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter. Overall, wax-coated cardboard boxes – if littered inappropriately – are not deemed to cause the same level of harm to designated nature conservation sites as EPS food containers.
Will it support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions?	<b>+/?</b>	When compared to EPS food containers, it is anticipated that wax-coated cardboard boxes will have no adverse impacts on terrestrial and marine ecosystems and hence support the protection and enhancement of these areas. However, for the reasons discussed in Section 7.2.2, the significance of the effect on marine environments is to some extent uncertain.
Will it help avoid pollution of the terrestrial, coastal and marine environments?	<b>+/?</b>	It is anticipated that the alternative option would help reduce the risk of pollution (associated with littering) of terrestrial and marine ecosystems. For the reasons discussed in Section 7.2.2, the significance of the effect on marine environments is to some extent uncertain.

<b>Measure No 7</b>		
Material/item in scope	Cups and beverage containers made of expanded polystyrene <sup>99</sup>	
The alternative option	Plastic-coated paper cups	
Notes:		
SEA criteria	Score	Commentary
Will it protect and/or enhance designated nature conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?	<b>+/?</b>	As the alternative option for EPS cups (i.e, plastic-coated paper cup) has a layer of plastic lining, we assumed that plastic-coated cups – if littered inappropriately – will cause the same level of harm on biodiversity at terrestrial sites of importance for nature conservation, in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter. However, potential harm is expected to be relatively lower as the amount of plastic in paper cups is 75% less than EPS cups and beverage containers.
Will it support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions?	<b>0</b>	We do not expect to see any improvement in this area by replacing EPS cups by paper cups with plastic coating.
Will it help avoid pollution of the terrestrial, coastal and marine environments?	<b>+/?</b>	We do expect plastic-coated paper cups to help avoid pollution as the as the amount of plastic in paper cups is 75% less than EPS cups and beverage containers.

<sup>99</sup> This category covers both item 8 and 9 listed in part B of the Directive's Annex: Beverage containers made of expanded polystyrene, including their caps and lids, and Cups for beverages made of expanded polystyrene, including their covers and lids.

<b>Measure No 8</b>		
Material/item in scope	Oxo-degradable HDPE	
The alternative option	Conventional HDPE	
Notes:		
SEA criteria	Score	Commentary
Will it protect and/or enhance designated nature conservation sites e.g. Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Importance, Ancient Woodlands, Marine Protected Areas and Ramsar Sites?	<b>+/?</b>	<p>Introducing market restrictions on Oxo-degradable HDPE might incentivise a reduction in litter. The alternative option (Conventional HDPE) is also a single-use item and – if littered inappropriately – is expected to cause less harm on biodiversity at terrestrial sites of importance for nature conservation, in particular those sites protected for their importance to wild birds which are particularly vulnerable to the effects of litter.</p> <p>According to a report commissioned by the trade association European Bioplastics (EUBP)<sup>100</sup>, there is currently insufficient evidence that oxo-degradable plastics “biodegrade fully or within reasonable time”. The report goes on to highlight that the pro-oxidant additives present in such materials could potentially cause toxic effects in soil.</p> <p>Overall, Conventional HDPE seems to have a lower negative effect on biodiversity. Further analysis is required in order to holistically assess the impact of conventional plastics on biodiversity.</p>
Will it support the protection and enhancement of terrestrial, marine and coastal ecosystems, including species and habitats, and their interactions?	<b>+/?</b>	Pro-oxidant additives could potentially cause toxic effects in soil; therefore, any alternative option will reduce the risk of these chemicals leaking to the terrestrial, marine and coastal ecosystems.
Will it help avoid pollution of the terrestrial, coastal and marine environments?	<b>+/?</b>	Pro-oxidant additives could potentially cause toxic effects in soil; therefore, any alternative option will reduce the risk of these chemicals leaking to the terrestrial, marine and coastal ecosystems.

<sup>100</sup> European Commission (2016) The impact of the use of "oxo-degradable" plastic on the environment [Online]. Available at: <https://op.europa.eu/>

## 7.5 Mitigation and Enhancement

As single-use plastic items targeted by market restrictions will be replaced by single-use compostable items which are made of paper or wood, it would be imperative to design a clear and targeted awareness campaign to ensure that citizens are well informed about the new measure and the best disposal route for alternative material in order to avoid unnecessary landfilling and to ensure that material value is preserved into any secondary use phase.

## 8. Soil

Soil is a complex, variable and living medium. It has a role in providing a habitat and is important for human activities, landscape and heritage and provides raw materials. It performs many vital functions: as a growing medium for food, forestry and other biomass production, filtration of water, and storage of carbon and nitrogen.

Oxo-degradable plastics are predominantly used as a mulch film within Scottish agriculture and are prone to leakage into the surrounding soil. As such, effects of the proposed market restrictions on the topic area of soil relate principally to the restriction of oxo-degradable plastics, however, also consider the effects of single-use plastic items where relevant. Soil damage and degradation, as is caused by the breakdown of oxo-degradable plastics and subsequent leakage of microplastics, can have potential negative effects on human health, natural ecosystems and climate change, impacting our ability to grow crops and other food sources for humans and animals.

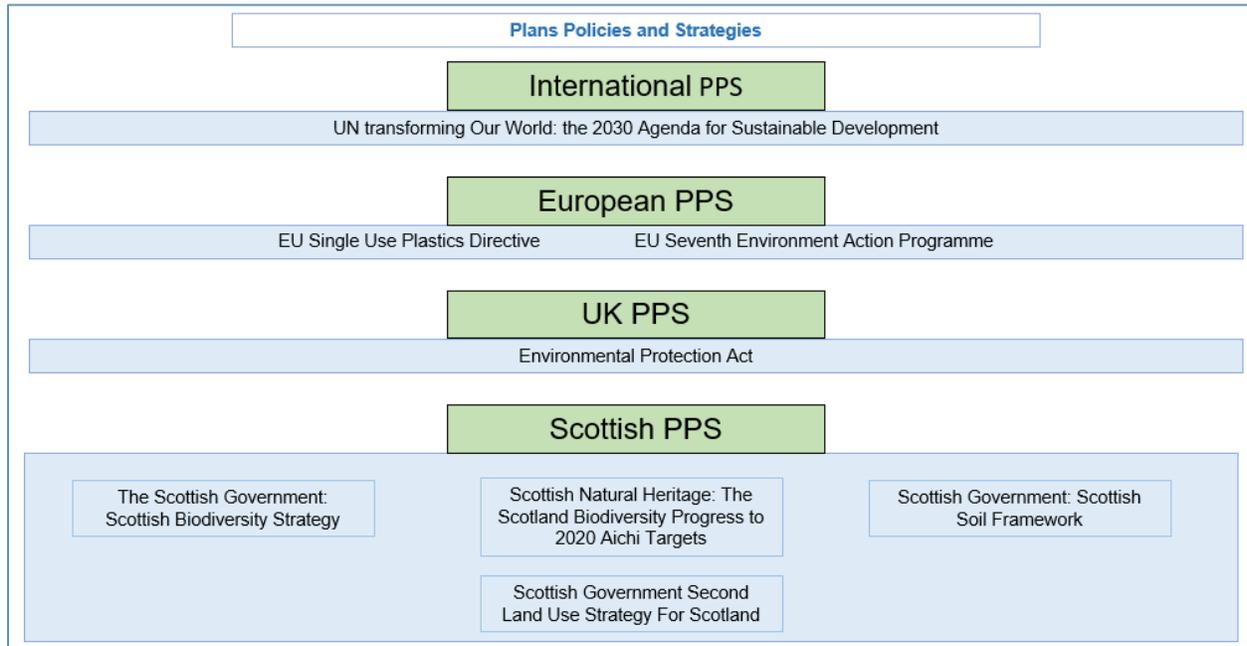
**This section provides the contextual information to inform the assessment (in terms of the review of Plans, Programmes and Strategies (PPS) and the baseline information) as well as an assessment of the effects of the SUP Directive on soil.**

### 8.1 Relationship with other Plans, Programmes and Strategies and Environmental Objectives

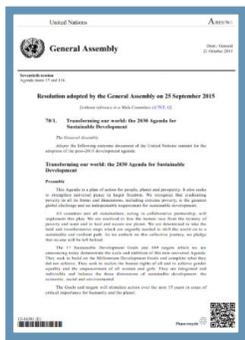
The PPS that have been assessed as relevant to the Soil topic are shown in **Figure 8-1** and summarised thereafter.

For the purposes of the review of the international plans and programmes for this SEA, it is assumed that the broad objectives of extant European Union (EU) legislation will be maintained once the UK has withdrawn from the EU and that similar or equivalent environmental protections will remain in place.

**Figure 8-1 Plans, Policies and Strategies related to soil**



The relationship between the identified PPSs and the restriction of single-use and oxo-degradable plastic items placed on the Scottish market are outlined below.

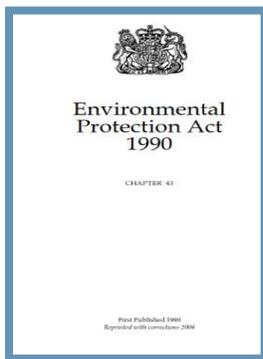


**United Nations (2015): Transforming our World - the 2030 Agenda for Sustainable Development** sets out 17 global goals agreed by the United Nations. The goals of the Agenda are outlined in Section 5.1 (above). With respect to Soil quality, Goal 2 of the Agenda seeks to (among other aims) promote sustainable agriculture; with the specific objective to progressively improve land and soil quality. By reducing the volume of microplastic leakage into the soil in Scotland, the levels of contamination of that soil will be reduced and thus its quality improved in-line with the UN Agenda.

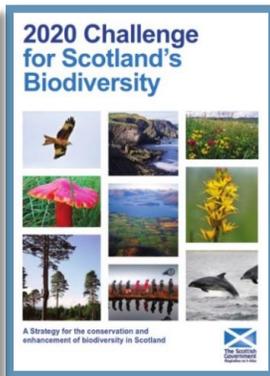
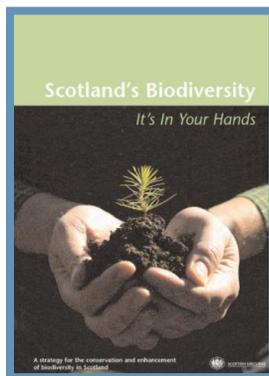
**European Union (2019): Directive on the reduction of the impact of certain plastic products on the environment** highlights significant negative environmental, health and economic impacts stemming from the continued use of certain plastic products. The aims and provisions of this Directive are outlined in Section 4.1 (above). Soil is referred to specifically within the Directive, which acknowledges that terrestrial pollution and contamination of soil by larger items of plastic and resulting fragments or microplastics can be significant, and that such plastic can leak into the marine environment. Reducing the volume of single-use and oxo-degradable plastic items placed on the market in

Scotland will likely lead to a concurrent reduction in microplastic levels present within soil, and an overall improvement in soil quality.

**European Union (2014): Seventh Environment Action Programme** recognises that soil degradation is a serious challenge, and that degradation of soil has far-reaching implications on the prosperity of biodiversity within the EU. The Programme mentions a specific need to reduce the pressures on soil and soil quality, through the passing of targeted legislation. Implementing market restrictions on oxo-degradable plastics in Scotland will reduce the extent to which soil is contaminated by microplastics and will likely lead to an overall improvement in quality and purity of productive soil, in line with the aims of the Programme.

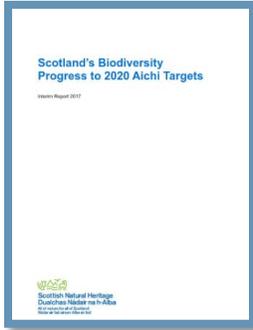


**UK Government (1990): The Environmental Protection Act** seeks to improve resource use and environmental conditions through the control of waste collections and management across the UK. The main requirements of the Act are outlined in Section 5.1 (above). The Act makes specific provision for the reduction of litter by making littering a criminal offence. As discussed previously, plastic litter is intrinsically linked with soil quality, as plastic leakage can lead to the presence of microplastics within fertile soil, thus reducing its utility. Implementing the proposed market restrictions in Scotland will lead to a likely reduction in plastic levels within Scottish soil.



**Scottish Biodiversity Strategy (2004)** was supplemented by **The Scottish Government's 2020 Challenge for Scotland's Biodiversity (2013)** document; both of which combine to form the **Scottish Biodiversity Strategy**. The main aims of the strategy are documented in Section 7.1 (above), however in reference to soil specifically, the Strategy emphasizes that Soil biodiversity plays a key role in maintaining soil fertility and its many

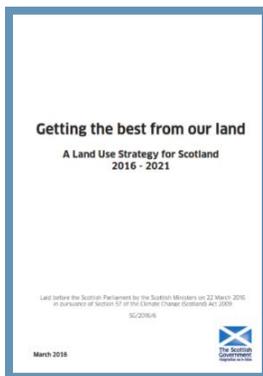
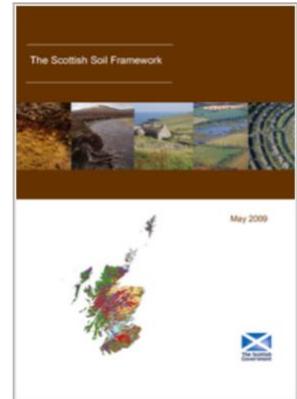
ecosystem services (such as providing clean water, nutrient cycling and climate regulation). It also mentions the need to protect soils from erosion, loss of organic matter, structural damage and pollution to sustain these services. As mentioned, restricting single-use and oxo-degradable plastics in Scotland will have the likely impact of reducing soil pollution consistent with the Strategy.



**Scottish Natural Heritage: The Scotland Biodiversity Progress to 2020 Aichi Targets (2017)** demonstrates Scotland's progress toward 20 global targets set by the UN Convention on Biological Diversity. The main observations of the report are outlined in Section 7.1 (above). With respect to soil, the report notes that Scottish soils are polluted by; among several other things; an excess of litter, and that there is a pressing need to reduce the extent to which soil fertility and utility is harmed by this excess. As mentioned, restricting oxo-degradable plastics will lead to a reduction in plastic litter and resultant leakage of microplastics into

Scottish soil.

**Scottish Government (2009) Scottish Soil Framework** sought to ensure that soils are recognised as a vital part of the Scottish economy, environment and heritage, and are to be safeguarded for existing and future generations. The Framework laid out a wide range of activities that were devised to contribute to 13 soil outcomes. One such outcome (SO9) is the need to reduce contamination of soils in Scotland by litter and other pollutants. As mentioned, reducing the prevalence of oxo-degradable plastic products for use within agriculture will likely lead to a reduction in associated plastic leakage into Scottish soil, and an overall improvement in its quality.



**Scottish Government (2016):** The second land use strategy for Scotland, **Getting the best from our land - A land use strategy for Scotland (2016-2020)** promotes the need to utilise resources sustainably and to safeguard the quality of natural resources in Scotland. Soil is mentioned specifically within the strategy, with an identified focus on improving soil quality in Scotland. This again aligns with the likely outcome of the restriction on single-use and oxo-degradable plastic items in Scotland – that a reduction in plastic litter will precipitate an improvement in soil quality through reduced contamination.

## 8.2 Baseline Characteristics

Numerous publications have highlighted the impact of microplastics, in particular those made of oxo-degradable plastics, on the quality of soil. Although this section covers the impact of both conventional and oxo-degradable plastics on soil, further emphasis has been placed on the impact of oxo-degradable plastics on soil.

Oxo-degradable plastics, mostly made of polyethylene (PE), are polymers that contain special additives that cause them to degrade after a certain amount of exposure to either sunlight or heat. The degradation period depends on the concentration of additives and the amount of sunlight and/or heat to which it is exposed<sup>101</sup>.

According to a study by Miles C. (2017)<sup>102</sup>, independent, third party data using standard ASTM & ISO biodegradation tests show only a small percentage or no plastic fragments of oxo-degradable plastic are utilized by soil microorganisms when oxo-degradable plastics are assessed in field tests. Even in laboratory environments with carefully controlled temperature and light conditions, oxo-degradable plastics biodegrade very slowly. No laboratory test has shown more than 91% degradation in soil for two years, and some show that degradation stops completely when 13 – 65% degradation has occurred.

Another report by Eunomia<sup>103</sup>, commissioned by the European Union, concludes that use of oxo-degradable plastics has been found to pose a risk of significant environmental damage. Globally, the Ellen MacArthur Foundation, along with 150+ organizations, also is calling for a ban of oxo-degradable plastic packaging<sup>104</sup>.

Oxo-degradable material is one of the commercially available products of agricultural mulch films. Oxo-degradable plastic is made with conventional plastic: high density PE (HDPE), low density PE (LDPE), polypropylene (PP), polystyrene (PS), polyethylene terephthalate (PET), or polyvinylchloride (PVC). Oxo-degradable plastic includes additives that cause the material to become brittle and break apart into fragments when exposed to UV light, heat and/or oxygen.

## 8.3 Consideration of Reasonable Alternatives

### 8.3.1 Methodology

Targeted single-use plastic products are expected to be replaced with alternatives made from shorter lived, largely biodegradable (wood, paper etc.) materials. This material shift

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<sup>101</sup> DEFRA (2010) Assessing the Environmental Impacts of Oxo-degradable Plastics Across Their Life Cycle [Online]. Available at: <http://randd.defra.gov.uk>

<sup>102</sup> Miles C. (2017) [Oxo-degradable Plastics Risk Environmental Pollution](#) [Online] Available at: [ag.tennessee.edu/](http://ag.tennessee.edu/)

<sup>103</sup> European Commission (2017) [Study to provide information supplementing the study on the impact of the use of “oxo-degradable” plastic on the environment](#) [Online]. Available at: [publications.europa.eu](http://publications.europa.eu)

<sup>104</sup> Ellen MacArthur Foundation (2017) **Error! Hyperlink reference not valid.** [Online]. Available at: [www.newplasticseconomy.org](http://www.newplasticseconomy.org)

will not only reduce microplastics entering the soil, but will the degradation of littered items, thereby reducing the 'litter begets litter' behavioural effect which occurs when litter accumulates over time.

Impacts of plastics on the quality of soil has been qualitatively assessed using available literature in this area and our understanding to the potential impacts of alternative options on soil.

### 8.3.2 Results

Literature is abundant with studies that confirm the degradation of plastics produces microplastics that affect the quality of soil<sup>105</sup>. This section provides a summary of potential impacts of proposed market restrictions on the quality of soil.

The key to each assessment score is shown below:

Score Key:	++	+	0	-	--	?
	Significant positive effect	Minor positive effect	No overall effect	Minor negative effect	Significant negative effect	Score uncertain
<p>NB: where more than one symbol is presented in a box it indicates that the SEA has found more than one score for the category. Where the scores are both positive and negative, the boxes are deliberately not coloured (i.e. 'no overall effect'). Where a box is coloured but also contains a "?" this indicates uncertainty over whether the effect could be a minor or significant effect although a professional judgement is expressed in the colour used. A conclusion of uncertainty arises where there is insufficient evidence for expert judgement to conclude an effect.</p>						

<sup>105</sup> UN Environment Programme (2018) [Plastic planet: How tiny plastic particles are polluting our soil](http://www.unenvironment.org) [Online]. Available at: [www.unenvironment.org](http://www.unenvironment.org)

Measure No 1 - 6		
Material/item to be restricted:	See Table 7.1	
The alternative option	See Table 7.1	
Notes:		
SEA criteria	Score	Commentary
Will the proposal contribute to reducing levels of soil contamination?	+	<p>Microplastics could potentially be produced by the degradation of plastic products (especially products coated with a thin layer of plastic lining such as plates). Researchers from the Leibniz-Institute of Freshwater Ecology and Inland Fisheries (IGB)<sup>106</sup> carried out a study to investigate the impacts of plastics on ecosystems on dry land. Results reveal that the impact of microplastics in soils could have a long-term negative effect on such ecosystems. The authors say terrestrial microplastic pollution is much higher than marine microplastic pollution – estimated at four to 23 times higher, depending on the environment.</p> <p>Market restrictions on plastic product will reduce the likelihood of microplastic leakages to the soil and consequently improve the quality of soil.</p>

<sup>106</sup> Forschungsverbund Berlin (2018) [An underestimated threat: Land-based pollution with microplastics](http://www.sciencedaily.com) [Online]. Available at: [www.sciencedaily.com](http://www.sciencedaily.com)

<b>Measure No 7</b>		
Material/item to be restricted:	Cups and beverage containers made of expanded polystyrene	
The alternative option	Plastic-coated paper cups	
Notes:		
SEA criteria	Score	Commentary
Will the proposal contribute to reducing levels of soil contamination?	+/?	<p>Although cups and beverage containers made of expanded polystyrene will be replaced by plastic-coated paper cups, we still expect a reduction in the amount of microplastic leaked to soil as the amount of plastic in paper cups is 75% less than EPS cups and beverage containers.</p> <p>In short, market restrictions on EPS cups will reduce the amount of microplastic that is likely to be leaked into soil and will consequently improve the quality of soil.</p>

Measure No 8		
Material/item in scope	Oxo-degradable HDPE	
The alternative option	Conventional HDPE	
Notes:		
SEA criteria	Score	Commentary
Will the proposal contribute to reducing levels of soil contamination?	+/?	<p>Oxo-degradable material is used as an agricultural mulch as outlined earlier in Section 8.2.</p> <p>As the oxo-degradable material is designed to degrade in situ there is the potential for microplastics produced by the breakdown of this material to have an impact on soil quality. According to DEFRA, it is suggested that oxo-degradable plastics left in the open environment in the UK degrade to small fragments within 2 to 5 years<sup>107</sup>. Removal and replacement of this material would therefore be likely to have a direct positive impact on soil.</p> <p>The paucity of data has made it difficult to quantify the amount of oxo-degradable plastics used in Scotland. However, we believe that imposing market restrictions on oxo-degradable plastics is expected to reduce the amount of microplastics leaked to the soil and hence lead to a minor positive effect.</p>

### 8.4 Mitigation and Enhancement

As single-use plastic items targeted by market restrictions will be replaced by paper or wood alternatives that could be recycled, it would be imperative to design a clear and targeted awareness campaign to ensure that citizens are well informed about the best recycling route to each item to ensure that material value is preserved.

### 9. Cumulative Effects

**Schedule 3 (6) (e) of the Environmental Assessment (Scotland) Act 2005 requires that the “secondary, cumulative and synergistic effects” of the SUP Directive are assessed. This section provides an assessment of the cumulative effects of**

<sup>107</sup> DEFRA (2010) Assessing the Environmental Impacts of Oxo-degradable Plastics Across Their Life Cycle [Online]. Available at: <http://randd.defra.gov.uk>

**proposed market restrictions on single-use plastic items in scope both alone (Section 9.1) and in-combination with other plans and programmes (Section 9.2).**

## 9.1 Cumulative effects of market restrictions on single-use plastic items in scope

This section presents the cumulative effects for proposed market restrictions on single-use plastic items in scope. The cumulative effects identified are based on an overall judgment of the effects of proposed measures on the five SEA topics included in the assessment, taking into account the range of effects on the assessment questions/SEA criteria as presented in sections 4 to 7 (i.e. whether significant or minor, positive or negative).

The cumulative effects of proposed measures against each SEA topic are summarised in Table 9-1.

Our analysis shows that the proposed measures will generate cumulative positive effects in respect of climatic factors (achieving carbon savings of 6,188 tonnes CO<sub>2</sub>e), landscape/visual impacts and biodiversity related to reduced littering. However, **the magnitude of these positive effects is not deemed to be significant given the relatively small scale of materials in question.**

**No cumulative significant negative effects have been identified during the assessment.** The proposed market restrictions are expected to generate an additional 1,440 tonnes of waste as we shift from plastics to heavier alternatives (e.g., cardboard and wood). This amounts to a 0.001% increase in total Scottish waste and is therefore deemed insignificant. The proposed measures don't require additional infrastructure facilities or major changes to the way waste is collected and managed in Scotland.

**Table 9-1 Summary of cumulative effects from targeted single-use plastic items.**

Measure No.	Single-use plastic item	Alternative option	Material Assets	Climatic Factors	Landscape and Visual Impacts	Biodiversity, flora and fauna	Soil
1	Cutlery	Wooden Cutlery	+/?	++	+/?	+/?	+
2	Plates	Wax-coated Paper Plates	+/?	++	+/?	+/?	+
3	Beverage Stirrer	Wooden Stirrer	+/?	+	+/?	+/?	+
4	Straws	Wax-line Paper Straws	+/?	++	+/?	+/?	+
5	Balloon sticks	Cardboard Balloon Sticks	+/?	+	+/?	+/?	+
6	Food containers made of expanded polystyrene	Wax-coated Cardboard Boxes	+/?	++	+/?	+/?	+
7	Cups and beverage containers made of expanded polystyrene	Plastic-coated paper cups	-/?	-	+/?	+/?	+/?
8	Oxo-degradable HDPE	Conventional HDPE	0/?	+	0	+/?	+/?

The key to each assessment score is shown below.

Score Key:	++	+	0	-	--	?
	Significant positive effect	Minor positive effect	No overall effect	Minor negative effect	Significant negative effect	Score uncertain
<p>NB: where more than one symbol is presented in a box it indicates that the SEA has found more than one score for the category. Where the scores are both positive and negative, the boxes are deliberately not coloured (i.e. 'no overall effect'). Where a box is coloured but also contains a "?" this indicates uncertainty over whether the effect could be a minor or significant effect although a professional judgement is expressed in the colour used. A conclusion of uncertainty arises where there is insufficient evidence for expert judgement to conclude an effect.</p>						

## 9.2 Cumulative effects of proposed market restrictions with other plans and programmes

The proposed market restrictions would sit within and across a number of other pre-existing plans and programmes (Sections 4.1-7.1 above) that are relevant to the effective management of plastic wastes and their wider effects.

Although the combined effects of the proposed market restrictions and other plans and programmes are difficult to fully assess, it is anticipated that this intervention will support and enhance the pre-existing aims, objectives and targets of the Plans and Programmes as follows:

- **UN Sustainable Development Goal 14** - Placing a restriction on the specified single-use plastic items would directly contribute to efforts around UN Sustainable Development Goal 14 relating to conservation and sustainable use of oceanic and marine resources.
- **UN Sustainable Development Goal 15** - relates to conservation, restoration and sustainable use of terrestrial ecosystems, and halting and reversing land degradation and biodiversity loss. A reduction in plastic-based products may precipitate an attendant increase in paper products, which will place greater strain on land use, as more trees are needed to meet this increased demand in paper-based products.
- **EU Water Framework Directive (2000)** - called for a reduction in the amount of plastics entering the environment, which is a fundamental principle of the proposed market restrictions.
- **The EU Directive on the Reduction of the Impact of Certain Plastic Products on the Environment (2019)** - calls for restrictions to be placed on commonly found single-use and oxo-degradable plastics; mirroring the proposed market restrictions.
- **The Environmental Protection Act (1990)** - was implemented to reduce plastic littering and pollution and aligns closely with the aims of the proposed market restrictions in mitigating litter levels.
- **The Climate Change (Scotland) Act (2009), The Marine Litter Strategy for Scotland (2014), and the National Litter Strategy (Scotland) (2014)** – Each emphasise the need for a decrease in terrestrial and marine pollution and litter, and for greater consideration and respect for the Scottish environment, as echoed by the proposed market restrictions.
- **The Scottish Biodiversity Strategy (2004/2013)** - calls for the imperative need to continuously improve the health of ecosystems and natural habitats within Scotland. As mentioned, any increase in paper-based products may require land use change, as more trees are needed to cope with demand on materials.
- **The Scottish Government Circular Economy Strategy (2016)** - promotes the need for more responsible, sustainable resource use and greater respect for material assets. The aspirations of the Strategy are significantly enhanced by the restriction of single-use and oxo-degradable plastics in Scotland.

In summary, and at this stage, it is predicted that the proposals would generally not result in conflict between the programmes described but would in most instances compliment the aims and aspirations of many of these.

## 10. Assessment Conclusions and Recommendations

**This section outlines the headline findings of the strategic environmental assessment. It summarises the anticipated environmental effects of the proposed market restrictions on specified single-use plastic items and oxo-degradable plastic products before recommending proposals for monitoring the impact of the proposed changes.**

**The next stage will involve the launch of a public consultation on proposals. This section concludes by providing information to the public on how to share their thoughts and views on the proposed market restrictions.**

### 10.1 What are the environmental effects of restriction of single-use plastic products placed on the Scottish Market?

The proposed market restrictions are expected to have positive environmental effect across all impact categories assessed:

- Material assets
- Climatic factors and carbon and total GHG emissions;
- Soil
- Landscape; and
- Biodiversity.

By reducing demand for virgin fossil-based plastic, and shifting consumption to alternative materials, the proposed market restrictions will reduce the impact of litter and the volume of microplastics leaking into both terrestrial and marine environments, both of which negatively impact biodiversity. Displacing high-carbon fossil-based plastics with lower carbon alternatives such as paper and cardboard, will also result in a net carbon savings.

A summary of cumulative effects from targeted single-use plastic items is provided in **Table 9-1**.

## 10.2 Proposals for Monitoring

Section 19 of the Environmental Assessment (Scotland) Act 2005 requires the Responsible Authority to monitor significant environmental effects of the implementation of the Plan. The Responsible Authority will be the Scottish Government.

In order to ensure the intended benefits of the proposed market restrictions are being realised, the following monitoring framework is proposed:

- **Litter and Beach Clean Data** – litter and beach clean-up data collected in Scotland by organisations like Keep Scotland Beautiful and the Marine Conservation Society can be used to monitor changes in observable litter following the implementation of the proposed market restrictions.
- **Waste Composition Studies** – Zero Waste Scotland periodically conducts studies to determine the composition of Scotland’s waste. Zero Waste Scotland and the Scottish Government are considering plans to increase the frequency and scope of these studies, which could be used to assess the impact of the proposed market restrictions on waste.
- **Soil Monitoring** - soil monitoring is routinely undertaken by SEPA in partnership with the Soil Monitoring Action Plan (Soil MAP)<sup>108</sup> and could be used to monitor changes in microplastic pollution following the implementation of the proposed market restrictions.

The combination of above datasets will help determine whether there has been a reduction in plastic litter and leakage into the environment, and whether the anticipated switch to single-use items made of alternative, lower carbon materials has taken place.

## 10.3 Next Steps

Public views and comments are invited on the environmental impacts of the proposed market restrictions as set out in this Environmental Report. In particular, Scottish Government is interested to receive consultee responses to the following questions:

1. To what extent does the Environmental Report set out an accurate description of the current baseline and the business as usual scenario? (Please give details of additional relevant sources)

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<sup>108</sup> Scottish Government; Scotland’s Environment, 2020; ‘Soil Monitoring Action Plan (Soil MAP) [online]; available at <https://soils.environment.gov.scot/>

2. Do you think that the Environmental Report has correctly identified the likely significant effects of the proposed restriction on single-use and oxo-degradable plastics placed on the market in Scotland?
3. Do you agree with the recommendations and proposals for mitigation and enhancement of the environmental effects set out in the Environmental Report? (If not, what do you think should be the key recommendations and why?)
4. Are you aware of any further information that will help to inform the findings of the assessment? (Please give details of additional relevant sources)
5. Do you agree with the proposed arrangements for monitoring the significant effects of the proposed restriction? (If not, what measures do you propose?)

The consultation runs until 4 January 2021. Comments on the proposed market restrictions and the Environmental Report can be submitted online on the Introducing Market Restrictions on Problematic Single-use Plastic Items in Scotland Citizen Space which can be accessed [here](#).

Following the conclusion of the consultation period, the responses received will be analysed and reported. Key messages from respondents, including those of the various stakeholder groups, will be highlighted and the findings of the analysis will be taken into account in the adoption of the proposed market restrictions.

Upon implementation of any such restrictions, a Post-adoption SEA Statement will be prepared. This Statement will reflect on the findings of the SEA assessment and the views expressed in the consultation, and outline how the issues raised have been considered in the finalisation of the policy.

## 11. Appendix A – Addressing Responses from Consultative Authorities

Ref	Consultation Response	Commentary / action taken	Relevant location in Environmental Report
<b>Scottish Environment Protection Agency (SEPA)</b>			
SEPA1	SEPA recommends expanding the scope of the assessment to include consideration of the potential for direct effects on soil and water.	<p>The scope of the assessment has now been expanded to include the direct effects on soil (see Chapter 8).</p> <p>With regards to the impacts of proposed measures on water, we have explored marine plastic pollution impacts within the biodiversity chapter, as suggested by SEPA. This is consistent with the DRS SEA, and makes sense given the primary impact of marine plastic pollution is on marine biodiversity.</p>	<p>Chapter 8 Soil</p> <p>Section 7.2.2 &amp; Section 7.4.2</p>
SEPA2	SEPA suggests considering alternative strategic policy approaches as well as alternative materials in the Reasonable Alternatives section.	<p>Article 5 of the EU Single Use Plastics Directive requires the introduction of market restrictions for a specified list of problematic single use plastic items and all oxo-degradable products. If Scotland is to meet standards set out by the EU, these items must be included within the scope of proposed measures.</p> <p>The Scottish Government understands the problems caused by single-use items cannot be solved entirely by replacing them with alternative entirely</p>	Section 2.4

		<p>single-use items made with different materials. While the focus of this consultation is on introducing market restrictions on the items listed in the SUP Directive, the Scottish Government wishes to see innovative solutions that support more sustainable business models and reusable alternatives prioritised over substitution of materials.</p> <p>It is the Scottish Government's intention to explore further market restrictions on a wider range of items in due course.</p> <p>However, the Scottish Government also recognises that market restrictions alone are insufficient to minimise the environmental impacts of single-use items, which is why it is pursuing a range of other measures aimed at addressing marine litter and reducing reliance on single use items by promoting prevention and reuse.</p> <p>The proposed measures set out in the consultation, therefore, form part of our overall approach to reducing reliance on single-use items and sit alongside a broader range of initiatives already established or underway, such as market restrictions on plastic microbeads and plastic stemmed-cotton buds. Our approach is underpinned by the work of the Expert Panel on Environmental Charges and Other</p>	
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		<p>Measures (EPECOM) whose second report looks at the issue of single-use in a holistic way.</p> <p>The Scottish Government is committed to implementing the other requirements of the SUP Directive, and has set out in the consultation existing actions and next steps that will help create a more circular plastics economy in Scotland.</p> <p>We intend to track, report and review the impact of measures and assess what more needs to be done to tackle marine litter and address our throwaway culture.</p> <p>However, such other measures are complementary to or would exceed the proposed market restrictions that are required by the EU Single Use Plastics Directive and, therefore, they are not considered reasonable alternatives.</p>	
SEPA3	<p>SEPA has outlined that additional analysis may be required for oxo-degradable plastics as proposed market restrictions are not a specific product, but a material which is being banned, and thus there may be multiple alternative materials which could be used to replace it depending on the application.</p>	<p>Although oxo-degradable plastics can be replaced by a number of different materials such as bio-based and conventional plastics, our analysis is based on switching all oxo-degradable plastics to conventional fossil-based plastics. This approach is deemed to represent the worst-case scenario as the overall environmental impacts of fossil-based plastics are higher than the impacts of bio-based plastics. Although</p>	Section 8.3.2

		<p>oxo-degradable plastics can be replaced by a number of different materials such as biobased and conventional plastics. Our analysis is based on the worst-case scenario where oxo-degradable plastic targeted in the proposed market restrictions is replaced by fossil-based plastic which deemed to have the highest environmental burden when compared against biobased plastics.</p> <p>Due to the paucity of data with regards to market shares of oxo-degradable applications in Scotland, our analysis covers the impacts of proposed market restrictions on two applications: carrier bags and agricultural mulch. Investigating other areas is not deemed to lead to a significant change to the trend observed in our analysis.</p>	
SEPA4	<p>SEPA suggests creating a diagram that depicts where proposal sits within wider policy context (if possible).</p> <p>To improve transparency and public understanding, “It would be helpful for the Environmental Report (ER) to [set out policy context in] diagrammatic form (if possible) to show key linkages between existing and on-going work packages”, such as “producer responsibility schemes and awareness</p>	<p>We have now added diagrams depicting plans, policies, and strategies related to each topic area.</p>	<p>See Figures 4.1, 5.1, 6.1, 7.1, and 8.1</p>

	campaigns and measures that could be brought in as part of a CE Bill”.		
SEPA5	<p>SEPA asked for further clarifications on how non-climatic factors are be assessed.</p> <p>“6.3 Section 3.3 of the Scoping report states that “analysis is conducted with respect to the carbon emissions relating to production and disposal processes of relevant SUPs and alternative replacement products. Carbon emissions relating to both sets of products are compared in order to determine the environmental consequences of replacing SUPs with more sustainable, non-plastic alternatives”. It is unclear how this relates to consideration of topics other than climatic factors. It is also unclear what is meant in Section 3.3 “The assessment has adopted a primary tier to explore the potential for significant primary environmental effects within the SEA scoped-in topics”. We would ask that these issues be clarified.”</p>	A dedicated methodology section has now been added under each topic chapter where the readership can find further information on the assessment methodology. See Section 4.3.1 for climatic factors, 5.3.1 for material assets, 6.3.1 for landscape and visual impacts, 7.3.1 for biodiversity, and 8.3.1 for soil.	See the third section in the following Chapters 4 to 8.
SEPA6	With regards to monitoring proposals, SEPA suggests explaining how any proposed monitoring measures link with any monitoring which already exists.	Proposed monitoring will call upon existing monitoring mechanisms such as those undertaken by Keep Scotland Beautiful; <sup>109</sup> NatureScot; <sup>110</sup> Scotland’s	Section 10.2 Proposals for monitoring

<sup>109</sup> LEAMS (Local Environment Audit Management System), administered by Keep Scotland Beautiful via the surveying of litter levels in residential streets across Scotland.

<sup>110</sup> Biodiversity levels in Scotland are monitored by NatureScot using [Biodiversity Strategy Indicators](#), in order to chart changes to biodiversity in-line with the aims of the Scottish Biodiversity Strategy, as noted [online] at [www.Nature.Scot](http://www.Nature.Scot)

		Environment <sup>111</sup> and others, in order to co-ordinate and maximise the utility of collected data.	
SEPA7	SEPA asked for further clarifications on what it is meant by primary and secondary tier effects. SEPA comment: "Screening/Scoping report mentioned assessing primary and secondary tier impacts, but did not explain what this means, why it is necessary or how it will be done"	In order to simplify and clarify the methodology, we have now removed all references to primary and secondary tier effects and only focused on the significant effects across the impact categories agreed by the consultative authorities.	Section 3.4
SEPA8	SEPA suggests looking into the potential effects of including a wider range or a different set of items to those included in the proposed single-use plastic directive. If such approaches are considered not to be "reasonable" then SEPA asked for justifications to be provided in the ER.	The Scottish Government has committed to meet standards set out in the SUP Directive. Article 5 requires the introduction of market restrictions for the specified list of problematic single use plastic items and all oxo-degradable products. The items covered by the Directive are based on the items most commonly found littered on beaches across Europe. If Scotland is to meet standards set out by the EU, these items must be included within the scope of proposed measures.  Whilst the focus of the proposed measures is on items covered by the SUP Directive, we recognise that Scotland's beaches are blighted by	N/A

<sup>111</sup> Scottish Government; Scotland's Environment, 2020; 'Soil Monitoring Action Plan ([Soil MAP](https://soils.environment.gov.scot/)) [online]; available at <https://soils.environment.gov.scot/>

		<p>some items not specified in the Directive.</p> <p>It is the Scottish Government's intention to explore further market restrictions on a wider range of items in due course, as set out in the consultation.</p> <p>As these measures are complementary to or would exceed the proposed market restrictions required by the EU Single Use Plastics Directive, they are not considered reasonable alternatives.</p>	
<b>Scotland's Nature Agency (NatureScot)</b>			
NatureScot 1	NatureScot recommends expanding the scope of the assessment to include consideration of the potential for direct effects on soil and water.	This point is addressed in our response to comment above (SEPA 1)	Chapter 8 Soil  Section 7.2.2 & Section 7.4.2
NatureScot 2	NatureScot asked to clarify what it is meant by primary and secondary approaches and review criteria used under the landscape and visual impacts criterion.	This point is addressed in our response to comment above (SEPA 7)	Section 3.4
NatureScot 3	NatureScot outlined that other policies may be more effective at achieving the overarching goal of reducing environmental impacts of single use items/plastics. NatureScot asked whether additional policy measures to tackle Scotland's	This point is addressed in our response to comment above (SEPA 2)	

	throw-away culture should be considered a reasonable alternative?		
NatureScot 4	General comment: The table in Appendix B needs to be clarified as Measures four to eight in the Material Assets section appear to relate to Biodiversity.	This issue has been addressed.	Section 5.3.2
NatureScot 5	General comment: Simplify methodology using narrative approach where uncertainties exist, similar to the commentary in the table in Appendix B. Avoid repetition.	<p>A dedicated methodology section has now been added under each topic chapter where the readership can find further information on the assessment methodology. See Section 4.3.1 for climatic factors, 5.3.1 for material assets, 6.3.1 for landscape and visual impacts, 7.3.1 for biodiversity, and 8.3.1 for soil.</p> <p>We have also added a summary table in Results section under each topic to make it easier for the readership to compare results across different scenarios.</p>	See the third section in the following Chapters 4 to 8.

## 12. Appendix B - SEA Compliance Checklist

<b>Environmental Report Requirements</b>	
<b>Relevant Sections of the Environmental Assessment Act</b>	<b>Section(s) of This Report</b>
14 (2) The report shall identify, describe and evaluate the likely significant effects on the environment of implementing—	
(a) the proposals in the plan or programme; and	Refer to sections: 4 to 10
(b) reasonable alternatives to the plan or programme.	Refer to sections:  4.3 Climate Change: consideration of reasonable alternatives  5.3 Material Assets: consideration of reasonable alternatives  6.3 Landscape and Visual Impacts: consideration of reasonable alternatives  7.4 Biodiversity: consideration of reasonable alternatives  8.3 Soil: consideration of reasonable alternatives
14 (3) The report shall include such of the information specified in schedule 3 as may reasonably be required.	
<b>Information referred to in schedule 3</b>	
1. An outline of the contents and main objectives of the plan or programme, and of its relationship (if any) with other qualifying plans and programmes.	Refer to sections:  1.1 Background to EU SUP Directive  1.2 Background to SEA

	<p>1.3 Purpose of Environmental Report</p> <p>1.4 Environmental Report Structure</p> <p>2. Restrictions of single-use plastic items being placed on the market in Scotland</p> <p>2.1 EU Single-Use Plastics Directive - Article 5</p> <p>2.2 Scotland's Response</p>
<p>2. The relevant aspects of the current state of the environment;</p> <p>and the likely evolution thereof without implementation of the plan or programme.</p>	<p>Refer to sections:</p> <p>4.2 Material assets; Baseline Characteristics</p> <p>5.2 Climatic Factors; Baseline Characteristics</p> <p>6.2 Landscape and visual effects; Baseline Characteristics</p> <p>7.2 Biodiversity; Baseline Characteristics</p> <p>8.2 Soil; Baseline Characteristics</p>
<p>3. The environmental characteristics of areas likely to be significantly affected.</p>	<p>Refer to sections:</p> <p>4.2 Material assets; Baseline Characteristics</p> <p>5.2 Climatic Factors; Baseline Characteristics</p> <p>6.2 Landscape and visual effects; Baseline Characteristics</p> <p>7.2 Biodiversity; Baseline Characteristics</p>

	8.2 Soil; Baseline Characteristics
<p>4. Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds and Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna (as last amended by Council Directive 97/62/EC).</p>	<p>Refer to sections:</p> <p>4.1 Climatic Factors: Relationship with other Plans, Programmes and Strategies and Environmental Objectives</p> <p>4.2 Climatic Factors; Baseline Characteristics</p> <p>5.1 Material assets: Relationship with other Plans, Programmes and Strategies and Environmental Objectives</p> <p>5.2 Material assets: Baseline Characteristics</p> <p>6.1 Landscape and Visual Impacts: Relationship with other Plans, Programmes and Strategies and Environmental Objectives</p> <p>6.2 Landscape and visual effects; Baseline Characteristics</p> <p>7.1 Biodiversity: Relationship with other Plans, Programmes and Strategies and Environmental Objectives</p> <p>7.2 Biodiversity; Baseline Characteristics</p> <p>8.1 Soil: Relationship with other Plans, Programmes and Strategies and Environmental Objectives</p> <p>8.2 Soil: Baseline Characteristics</p>
<p>5. The environmental protection objectives, established at international,</p>	<p>Refer to sections:</p>

<p>Community or Member State level, which are relevant;</p> <p>and the way those objectives and any environmental considerations have been taken into account during its preparation.</p>	<p>4.1 Climatic Factors: Relationship with other Plans, Programmes and Strategies and Environmental Objectives</p> <p>5.1 Material assets: Relationship with other Plans, Programmes and Strategies and Environmental Objectives</p> <p>6.1 Landscape and Visual Impacts: Relationship with other Plans, Programmes and Strategies and Environmental Objectives</p> <p>7.1 Biodiversity: Relationship with other Plans, Programmes and Strategies and Environmental Objectives</p> <p>8.1 Soil: Relationship with other Plans, Programmes and Strategies and Environmental Objectives</p>
<p>6. The likely significant effects on the environment, including—</p> <p>a) on issues such as -</p> <ul style="list-style-type: none"> <li>i. biodiversity and natural heritage;</li> <li>ii. population;</li> <li>iii. human health;</li> <li>iv. fauna;</li> <li>v. flora;</li> <li>vi. soil;</li> <li>vii. water;</li> <li>viii. air;</li> <li>ix. climatic factors;</li> <li>x. material assets;</li> <li>xi. cultural heritage and historic environment, including architectural and archaeological heritage;</li> <li>xii. landscape;</li> <li>xiii. the inter-relationship between the issues referred to in heads (i) to (xii).</li> </ul> <p>b) short, medium and long-term effects.</p>	<p>Refer to sections:</p> <ul style="list-style-type: none"> <li>4. Material assets</li> <li>5. Climatic Factors</li> <li>6. Landscape and Visual Impacts</li> <li>7. Biodiversity</li> <li>8. Soil</li> </ul>

<p>c) permanent and temporary effects.</p> <p>d) positive and negative effects.</p> <p>e) secondary, cumulative and synergistic effects.</p>	
<p>7. The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the marine spatial plan or programme.</p>	<p>Refer to sections:</p> <p>4.3 Climate Change: consideration of reasonable alternatives</p> <p>5.3 Material Assets: consideration of reasonable alternatives</p> <p>6.3 Landscape and Visual Impacts: consideration of reasonable alternatives</p> <p>7.4 Biodiversity: consideration of reasonable alternatives</p> <p>8.3 Soil: consideration of reasonable alternatives</p>
<p>8. An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of expertise) encountered in compiling the required information.</p>	<p>Refer to Section 3: The Approach to the Assessment</p>
<p>9. A description of the measures envisaged concerning monitoring in accordance with section 19.</p>	<p>See section 10.2: Proposals for monitoring</p>
<p>10. A non-technical summary</p>	<p>Refer to accompanying non-technical summary on pages 2 – 9</p>

## 13. Appendix C – Abbreviations

<b>Abbreviation</b>	<b>Description</b>
<b>BRIA</b>	Business Regulatory Impact Assessment
<b>CEP</b>	Circular Economy Package
<b>DEFRA</b>	Department for Environment, Food and Rural Affairs
<b>ELC</b>	European Landscape Convention
<b>EPECOM</b>	Expert Panel on Environmental Charges and Other Measures
<b>EPR</b>	Extended Producer Responsibility
<b>EPS</b>	Expanded polystyrene
<b>EQIA</b>	Equality Impact Assessment
<b>EU</b>	European Union
<b>EU ETS</b>	The EU Emissions Trading Scheme
<b>GHG</b>	Greenhouse gas
<b>HDPE</b>	High-density polyethylene
<b>HES</b>	Historic Environment Scotland
<b>kg CO<sub>2e</sub></b>	Kilogram carbon dioxide equivalent
<b>MRF</b>	Material Recovery Facility
<b>Mt CO<sub>2e</sub></b>	Million tonnes carbon dioxide equivalent
<b>NatureScot</b>	Scottish Natural Heritage
<b>NPF</b>	National Planning Framework
<b>NSA</b>	National Scenic Areas
<b>PAS</b>	Post Adoption Statement
<b>PET</b>	polyethylene terephthalate
<b>PPS</b>	Plan, programme and strategy
<b>SACs</b>	Special Areas of Conservation
<b>SEA</b>	Strategic Environmental Assessment
<b>SEPA</b>	Scottish Environment Protection Agency
<b>SG</b>	The Scottish Government
<b>SPAs</b>	Special Protection Areas
<b>SSSI</b>	Site of Special Scientific Interest
<b>SUP Directive</b>	Single-use Plastics Directive

**UNFCCC**

The United Nations Framework Convention on Climate Change

**WRAP**

Waste and Resource Action Programme



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