



Scottish Environment  
LINK

## Environment Links UK response to Defra, Scottish Government, Welsh Government and Department of Agriculture, Environment and Rural Affairs in Northern Ireland's Consultation:

**Proposals to ban the use of plastic microbeads in cosmetics and personal care products in the UK and call for evidence on other sources of microplastics entering the marine environment**

February 2017

Environment Links UK comprises the combined membership of Wildlife and Countryside Link, Scottish Environment LINK, Wales Environment Link and Northern Ireland Environment Link, and collectively represents more than 8 million supporters across the United Kingdom. This consultation is supported by the following 35 organisations:

### ***Wildlife and Countryside Link***

- A Rocha UK
- Amphibian and Reptile Conservation
- Angling Trust
- The British Mountaineering Council
- Buglife
- ClientEarth
- Environmental Investigation Agency
- Friends of the Earth England
- Greenpeace UK
- Institute of Fisheries Management
- International Fund for Animal Welfare
- Marine Conservation Society
- MARINELife
- The National Trust
- ORCA
- The Rivers Trust
- RSPB
- RSPCA
- Whale and Dolphin Conservation
- Wildfowl & Wetlands Trust
- The Wildlife Trusts
- WWF-UK

### ***Northern Ireland Environment Link***

- Northern Ireland Marine Task Force
- Buglife
- Ulster Wildlife

### ***Wales Environment Link***

- Buglife
- Marine Conservation Society
- RSPB Cymru
- Wildlife Trusts Wales

### ***Scottish Environment LINK***

- Association for the Protection of Rural Scotland
- Buglife
- Friends of the Earth Scotland
- Hebridean Whale and Dolphin Trust
- Marine Conservation Society
- National Trust for Scotland
- RSPB Scotland
- Scottish Wildlife Trust
- Whale and Dolphin Conservation
- WWF Scotland

### ***Other organisations***

- Fauna & Flora International
- Fidra

## **Executive summary**

Environment Links UK (ELUK) welcomes the opportunity to provide feedback on the current proposal to ban the use of plastic microbeads in cosmetic and personal care products. ELUK members believe that the Government should adopt a more comprehensive ban than is currently proposed. Marine plastic pollution poses a serious threat to marine biodiversity and is a potential threat to human health. We therefore urge the Government to introduce a ban that prohibits the use of all solid water-insoluble microplastic ingredients in all products which have the potential to go down the drain or be discharged directly or indirectly into waterways or the marine environment, either by design or reasonably foreseeable use. This represents an opportunity for the UK to lead the way globally in adopting the most comprehensive ban on the use of microplastic ingredients to date.

## **Introduction**

ELUK welcomes the proposal to ban microbeads in personal care and cosmetic products and the opportunity to provide evidence on the scope of the proposed ban and on other sources of microplastics entering the marine environment. Marine plastic pollution represents a major threat to marine biodiversity and a ban on microplastic ingredients is a significant step in tackling this issue. A report this year to the European Commission estimated that, in Europe, microplastics in personal care and cosmetic products could be adding up to 8,627 tonnes of plastic per year to the marine environment.<sup>1</sup> Once in the marine environment, microplastics can be ingested by species throughout the marine food chain, persist in organisms' digestive systems, release, adsorb and transfer contaminants and allow toxins to be transferred up the food chain. There is scientific evidence of adverse effects in a range of marine and freshwater species, including impacts on growth and reproduction in species that perform vital ecosystem functions, as well as in species that are important in commercial fisheries.<sup>2</sup>

We respond in detail to Part 2 of the consultation, which relates to proposals for a ban on microbeads in cosmetics and personal care products. We strongly believe that the legislation should apply to all products that contain water-insoluble microplastic ingredients and have the potential to be washed down the drain or be discharged directly or indirectly into waterways or the marine environment, either by design or user behaviour. We therefore fully support the call for evidence on the use of microplastic ingredients in product ranges outside the current proposed ban and urge you to consider extending the scope of the proposed ban to cover these other products. This represents an opportunity for the UK to lead the way globally in adopting the most comprehensive ban on the use of microplastic ingredients to

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<sup>1</sup> Sherrington, C., Darrah, C., Hann, S., Cole, G. & Corbin, M. 2016. Study to support the development of measures to combat a range of marine litter sources. Report for European Commission DG Environment. 432 pp.

<sup>2</sup> A range of potential impacts have been identified by the MSFD task group 10 and include: blockage of enzyme production; blockage of feeding appendages; diminished feeding stimulus; nutrient dilution; reduced growth rates; lowered steroid hormone levels; delayed ovulation and reproductive failure; and absorption of toxins.

Galgani, F. et al. 2010. Marine Strategy Framework Directive, Task Group 10 Report, Marine Litter. EUR 24340 EN – 2010  
GESAMP, 2015. Sources, fate and effects of microplastics in the marine environment: a global assessment (Kershaw, P. J.,ed.).

(IMO/FAO/UNESCO-IOC/WMO/IAEA/UN/UNEP/UNDP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). Rep. Stud. GESAMP No. 90, 96 p.

Wright, S.L., Thompson, R.C. and Galloway, T.S., 2013. The physical impacts of microplastics on marine organisms: a review. *Environmental Pollution*, 178, pp.483-492.

date.

We also set out ELUK members' views on Part 3 of the consultation, which covers evidence on other sources of microplastic pollution. This includes other sources of primary microplastics - particles which have been specifically manufactured at this small size for a purpose, such as pre-production plastic pellets, flakes and powders used in plastic manufacturing. It also covers sources of secondary microplastics, fragments of larger plastic items that have fragmented in the environment because of physical and chemical deterioration as well as exposure to sunlight.

## **ELUK response to Part 2: Proposals for a ban on microbeads in cosmetics and personal care products**

- a. **Are our proposals for a ban fit for purpose? If not, please explain why. What alternative wording in a ban would most effectively reduce the risk of microplastic particles from personal care and cosmetic products reaching the marine environment?**

As outlined in the "Explanation" section of the consultation document: "*This ban protects the marine environment and reduces the risk and severity of impacts of microplastics; supports the cosmetics industry by providing a level playing field, ensuring that all companies meet the same standards; and increases consumer confidence that products will not cause marine pollution or harm to the animals and plants found there.*"

A fit for purpose microbeads ban to achieve the above aims would have the following components:

### i. **Encompass all microplastic ingredients**

Any plastic that reaches the environment can become marine litter.

It is important that a ban on microbeads is not solely restricted to the 6 major microplastic ingredients commonly used in solid water-insoluble form (polyethylene, polypropylene, polyethylene terephthalate [PET], polytetrafluoroethylene [PTFE], polymethyl methacrylate [PMMA] and nylon), as there are likely to be other plastic polymers that are used, either today or in the future, which are likely to have a similar negative impact on aquatic life.

Legislating against a set list of microplastic ingredients poses a significant risk because it will create the opportunity to replace 'like with like'. It is widely understood that 'plastics' are not one single material. The industry itself states that "*the plastics' family is composed of a great variety of materials designed to meet the very different needs of thousands of end products. As products evolve, so do plastic materials, so many of them are still to come.*"<sup>3</sup>

For example, there are currently over 110 unverified polymeric ingredients of concern being used in a wide range of products including, but not limited to, make-ups, washing powders, and household and industrial cleaners.<sup>4</sup> According to information published by ecotoxicology experts and

<sup>3</sup> Plastics Europe (2016) Plastics – The Facts 2016. p21 <http://www.plasticseurope.org/Document/plastics---the-facts-2016-15787.aspx?Page=DOCUMENT&FolID=2>

<sup>4</sup> Fauna & Flora International (2017) Guidance on Effective Prevention of Microplastic Pollution through Corporate Ingredient Policy and/or Legislation, and references therein

consultancies, these could be solid water-insoluble microplastic ingredients.<sup>5</sup> The use of such ingredients in products which could also reach drainage or the aquatic environment due to design or reasonably foreseeable user behaviour has not come under the same scrutiny as the use of exfoliating microbeads and companies across these sectors have made even more limited commitments (or none at all) to ending the use of these ingredients.

Additionally, many types of polyethylene waxes used in personal care products can be defined as solid or semi-solid compounds and may be softer due to having smaller chain lengths; therefore, they may not retain their shape but would still be persistent in the marine environment.<sup>6</sup> The ban would be more effective if the definition of solid includes semi-solid forms of microplastic ingredients. Although the industry does not always consider these to be classed as microplastics, scientists confirm that polyethylene waxes fall under the definition of marine microplastic litter as they are non-degradable, water insoluble and are solid materials with a melting point well above sea temperatures.<sup>7</sup>

Only the use of the term “all solid water-insoluble microplastic ingredients” to describe what is being banned is adequate, with the definition of solid including semi-solid forms, in line with scientific evidence.

## **ii. Apply to all relevant products types**

In light of the stated intention to reduce the risk and severity of impacts of microplastics, a broader scope is necessary. Any product containing microplastic ingredients that may potentially be disposed of down a drain or reach the aquatic environment (either by design or reasonably foreseeable use) poses an environmental risk and should be covered by the ban. Only applicability to “all products entering drainage systems or discharged directly or indirectly into the aquatic environment, either by design or reasonably foreseeable use.” to describe the product range that the ban applies to is adequate.

If the Government does not proceed on the above basis and only places the ban on cosmetic and personal care products, the proposed wording will need to be amended to avoid ambiguity and loopholes (see 2(b) below).

## **iii. No exemption for biodegradable plastic ingredients**

There are no so-called “biodegradable” plastics that have been conclusively demonstrated to fully biodegrade in real-world marine environmental conditions or to be harmless to marine life, and no globally accepted standards in existence against which marine biodegradability of plastics can be

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<sup>5</sup> Leslie, H. A. (2015). Plastic in Cosmetics, Are we polluting the environment through our personal care?. United Nations Environment Programme (UNEP), 2015. Report for the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA).

Leslie, H. A. (2014). Review of Microplastics in Cosmetics. Report to the Dutch Ministry of Infrastructure and the Environment. The Hague, Netherlands.

<sup>6</sup> Sherrington, C., Darrah, C., Hann, S., Cole, G. & Corbin, M. 2016. Study to support the development of measures to combat a range of marine litter sources. Report for European Commission DG Environment. 432 pp.

<sup>7</sup> Leslie, H., and et al. (2014) Review of Microplastics in Cosmetics, Report for Dutch Ministry of Infrastructure and the Environment, July 2014

measured and/or proven. Any such “biodegradable” plastics would therefore still function as microplastic pollutants in the aquatic environment and could have the same negative impacts on marine and freshwater species. We welcome that the current proposal includes no exemption for so-called biodegradable plastics.

**iv. No exemption for plastic ingredients below a certain size**

The proposed definition of a plastic microbead or a microplastic ingredient should be any solid water-insoluble plastic particle <5mm in *any* dimension rather than <5mm in *every* dimension (for example the current proposal could exclude certain microplastics such as glitters that may be <5mm in one dimension but >5mm in another). The Government’s proposed wording may imply that the microbead must remain spherical to adhere to the definition. This was a criterion in some US state bans, before the national ban came into place. It is worth noting that the ability of a microbead particle to retain its shape throughout its life is not guaranteed. However, the impact on the marine ecosystem will not be diminished if the shape changes therefore this implication should be avoided.

Any plastic particle, of any size less than 5mm in any dimension, is a microplastic, and can cause damage to the marine environment. Previous corporate and trade body definitions of microbeads have sought to apply a minimum size limit. No exemptions should be made for microplastic ingredients below a certain size. The smaller the particle size the greater the range of organisms that can ingest it. The transfer of nano-sized plastics across cell membranes and associated adverse impacts on species has been demonstrated.<sup>8</sup> We therefore welcome that the current proposed wording does not introduce a lower size limit.

**v. A clear and prompt timeline for phase-out**

Several multinational brands have set implementation timelines – albeit of imperfect phase-out commitments – of two years from the date of announcement. This is also the timeframe of the US ban. It therefore seems reasonable that this becomes the standard (upper limit) timeframe for corporate commitments to be fully implemented. The Defra proposal provides a more ambitious timeframe and is therefore fully adequate in this respect.

The vast majority of public pressure on the issue of microplastic ingredients has focused on personal care products and this industry has been working to find alternatives for microbeads in these products for some time, therefore the proposed phase-out timeframe is completely achievable for these products. This is not necessarily the case for all industries where microplastic particles are in use. If the ban is extended to cover other product categories, as we recommend, there may be certain product categories where a longer time period prior to the introduction of a ban on manufacture or sale would be appropriate, to allow industry the time to find adequate alternatives. Further explanation is given under 2(g) below.

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<sup>8</sup> GESAMP (2016). “Sources, fate and effects of microplastics in the marine environment: part two of a global assessment” (Kershaw, P.J., and Rochman, C.M., eds). (IMO/FAO/UNESCO-IOC/UNIDO/WMO/IAEA/UN/UNEP/UNDP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). Rep. Stud. GESAMP No. 93, 220 p.

On the basis of the above criteria, the proposal for the ban as outlined in sections c), d), e), and f) of the consultation document is fit for purpose. In particular, we are very pleased to see that Defra has proposed a clear timeline for implementing the ban within two years of its announcement in September 2016 in England. We would urge the Devolved Administrations to coordinate with Defra and strive to meet these timeframes.

However, the scope of the ban as outlined in sections a) and b) is insufficient.

As described above, in order to fully address the risks posed to the marine environment (and potentially human health) through microplastic pollution of the oceans, any ban on microbeads should cover all solid water-insoluble microplastic ingredients that have the potential to go down the drain, or be discharged directly or indirectly into waterways or the marine environment either by design or reasonably foreseeable user behaviour. Current wording would fail to provide a level playing field for industry as it would create loopholes allowing certain products to continue to be used and to continue to negatively impact our marine environment.

Therefore we suggest the wording be changed to:

*a. we ban the manufacture and sale of all products containing microbeads in the UK (including all devolved territories).*

*b. The ban applies to all solid water-insoluble<sup>9</sup> microplastic ingredients 5 millimetres or less in any dimension, used as ingredients in products entering drainage or discharged directly or indirectly into the aquatic environment, either by design or reasonably foreseeable use.”<sup>10</sup>*

**b. This proposed ban applies to rinse-off cosmetics and personal care products including but not limited to exfoliating scrubs, shower gels and toothpastes. Is this category appropriate? If not, what range of products should the ban apply to, bearing in mind that the purpose of the ban is to protect the marine environment? Please supply evidence to support your suggestions.**

As outlined above, the legislation should cover all products that contain solid, water-insoluble microplastic ingredients and have the potential to be washed down the drain or be discharged directly or indirectly into waterways or the marine environment either by design or user behaviour. This is because, once in the marine environment all microplastics have the same potential to cause harm.

Microplastic ingredients are found in a wide range of cosmetic, make up and personal care products as well as domestic and industrial cleaning products, and probably other products that we are as yet unaware of. Therefore, from an environmental perspective it makes little sense to limit this ban to only certain product categories or to products that have a specific function, as explained below:

i. **Cosmetic and personal care products:**

The proposed legislation applies to cosmetic and personal care products. While there is no definition of ‘personal care product’ in UK law, there are two potential definitions for ‘cosmetic products’ contained elsewhere in UK law - this may create some confusion about what exactly is in scope of

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<sup>10</sup> As per the EU REgulation on general product safety, see <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32001L0095>

this legislation. ‘Cosmetic product’<sup>11</sup> and ‘cosmetic product intended to come into contact with the mucous membranes’<sup>12</sup> have different definitions, however, products that adhere to either definition could contain microplastic ingredients.

In addition to the above confusion, the definition of ‘cosmetic products’ excludes products ‘wholly for the purpose of treating or preventing disease’. This may give rise to a potential loophole, as there are already products on the market that contain microplastic ingredients that could fall within this exception (for instance toothpastes) that market themselves as specifically ‘treating and preventing disease’.

As mentioned, a microbead ban should not be restricted to a range of products but should include all products that may potentially be disposed of down a drain or reach the aquatic environment (either by design or reasonably foreseeable use). However, if the microbead ban is to be restricted to a range of products, those products must be clearly and unambiguously defined.

## ii. **No element of ‘intent’**

We are pleased to note that the Government’s proposed definition of ‘microbead’ does not include any element of intent. We fully support this.

Any definition should avoid the element of intent included in the US and French definitions of ‘microbead’. The US Microbead Free Waters Act includes an element of ‘intent’:<sup>13</sup>

*‘the term ‘plastic microbead’ means any solid plastic particle that is ...intended to be used to exfoliate or cleanse the human body or any part thereof’*

Similarly, the French definition bans ‘solid plastic particles for exfoliating or cleaning use.’

Microplastic ingredients may be added to a product without the intention to cleanse, their use may go beyond this to provide functions such as viscosity regulation, emulsification, film forming, binding, acting as a bulking agent, and in the case of oral care - tooth polishing.<sup>14</sup> Therefore, the word ‘intent’ or ‘purpose’ (or similar phrases) should be avoided.

## iii. **Rinse-off and leave on-products:**

The use of the term “rinse-off” is confusing and inappropriate. The EU Cosmetics Regulation defines the terms as:<sup>15</sup>

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<sup>11</sup> Meaning ‘any substance or preparation intended to be placed in contact with the various external parts of the human body (epidermis, hair system, nails, lips and external genital organs) or with the teeth and the mucous membranes of the oral cavity with a view exclusively or mainly to cleaning them, perfuming them, changing their appearance, correcting body odours, protecting them, or keeping them in good condition except where such cleaning, perfuming, protecting, changing, keeping or correcting is wholly for the purpose of treating or preventing disease’ The Cosmetic Products (Safety) Regulations 2008, para 3

<sup>12</sup> Meaning ‘a cosmetic product intended to be applied in the vicinity of the eyes, on the lips, in the oral cavity or to the external genital organs, and does not include any cosmetic product which is intended to come into only brief contact with the skin’, The Cosmetic Products (Safety) Regulations 2008, para 3

<sup>13</sup> <https://www.congress.gov/bill/114th-congress/house-bill/1321/text>

<sup>14</sup> Sherrington, C., Darrah, C., Hann, S., Cole, G. & Corbin, M. 2016. Study to support the development of measures to combat a range of marine litter sources. Report for European Commission DG Environment. 432 pp.

<sup>15</sup> Regulation (EC) No 1223/2009 Of the European Parliament and of the Council of 30 November 2009 on cosmetic products. The EU Cosmetics Regulation is directly applicable in the UK. The Cosmetic Products Enforcement Regulations 2013 do not define rinse-off and leave-on products.

- (a) ‘Rinse-off product’ means a cosmetic product which is intended to be removed after application on the skin, the hair or the mucous membranes;
- (b) ‘Leave-on product’ means a cosmetic product which is intended to stay in prolonged contact.

It is clear that the distinction between “rinse-off” and “leave-on” in this context has been made with safety concerns in mind, in order to restrict the use of certain substances that should not come into prolonged contact with the skin. It is not concerned with whether or not a product will eventually reach drainage or be discharged directly or indirectly into waterways or marine environments.

The true definition of the term “rinse-off” is vague and inconsistent across the industry, and does not make intuitive sense. For example a face mask or a leave in conditioner can be considered both as a ‘rinse-off’ and ‘leave-on’ product.<sup>16</sup> This would add significant confusion for consumers and regulators alike.

Microplastic ingredients are used in ‘leave-on’ products such as lotions, sunscreens, make-ups and deodorants. A recent research report indicated that the use of microplastics in some leave-on products may be “ubiquitous”, and estimated that between “3,800 and 7,500 tonnes of microplastic” might be used each year in Europe in these products.<sup>17</sup> Consumers generally do not make the distinction between ‘rinse-off’ and ‘leave-on products’. Polling undertaken by YouGov found that many products that would be classified as “leave on” under the Cosmetics Regulation are in fact routinely washed down the drain by the general public.<sup>18</sup> For example, 60% of people who use “leave on” products such as sun lotion or moisturiser wash this off directly down the drain, and 45% of people who use face, lip or eye make-up either wash this off directly down the drain or dispose of any tissues or wipes they use down the toilet. There is published evidence<sup>19,20,21,22,23,24</sup> showing that some of the common microplastic ingredients (that are often used in solid water-insoluble form), such as nylon, polyethylene and PET, are known to be used in solid (powder or flake) form in a range of “leave on” products, such as skin care creams, make-up foundation, face powders and eyeshadows. So, it is clear that there are examples of “leave on” products with microplastic ingredients that are in fact making their way to drainage in significant quantities, either by design or reasonably foreseeable use.

#### **iv. Cleaning and other products**

A preliminary review conducted by FFI and Greenpeace UK of more than 50 cleaning products, across 10 product types, on the UK market identified names of known microplastic ingredients in published, online

<sup>16</sup> <https://www.cosmeticsciencetechnology.com/articles/samples/491.pdf>

<sup>17</sup> House of Commons Briefing Paper - Microbeads and microplastics in cosmetic and personal care products 4 January 2017.

<sup>18</sup> <http://www.greenpeace.org.uk/sites/files/gpuk/YouGov%20polling.pptx>

<sup>19</sup> Blaustein, M. (1965). U.S. Patent No. 3,196,079. Washington, DC: U.S. Patent and Trademark Office.

<sup>20</sup> Sherrington, C., Darrah, C., Hann, S., Cole, G. and Corbin, M. (2016). Study to support the development of measures to combat a range of marine litter sources. Report for European Commission DG Environment. Eunomia Research & Consulting Ltd, Bristol

<sup>21</sup> Cosmetic Ingredient Review (2012). Safety Assessment of Modified Terephthalate Polymers as Used in Cosmetics. [http://www.cir-safety.org/sites/default/files/ModTer\\_122012\\_Tent\\_faa\\_final%20for%20posting.pdf](http://www.cir-safety.org/sites/default/files/ModTer_122012_Tent_faa_final%20for%20posting.pdf)

<sup>22</sup> Cosmetic Ingredient Review (2012). Safety Assessment of Nylon as Used in Cosmetics. [www.cir-safety.org/sites/default/files/nylon122012tent\\_faa\\_final%20for%20posting.pdf](http://www.cir-safety.org/sites/default/files/nylon122012tent_faa_final%20for%20posting.pdf)

<sup>23</sup> Cosmetic Products Notification Portal (2013). Article 13 user manual.

[http://ec.europa.eu/consumers/sectors/cosmetics/files/pdf/cpnp\\_user\\_manual\\_en.pdf](http://ec.europa.eu/consumers/sectors/cosmetics/files/pdf/cpnp_user_manual_en.pdf)

<sup>24</sup> Leslie, H. A. (2015). Plastic in Cosmetics, Are we polluting the environment through our personal care?. United Nations Environment Programme (UNEP), 2015. Report for the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA).

ingredient lists of 7 industrial hand cleaning products and in 1 floor cleaning product as of January 2017. Additionally, unverified polymeric ingredients of concern were documented in 33 cleaning products and in 6 product types as of January 2017. Summaries of microplastic ingredient data from FFI's UK product database can be found online.<sup>25</sup> A recent study in the Netherlands found suspected plastic ingredients in 10 out of over 400 tested abrasive floor cleaners on the Dutch market.<sup>26</sup> Although not included in the scope of this study it noted that there were also indications that persistent and non-soluble polymers are being used in certain laundry detergents. For instance, polypropylene terephthalate was found as an ingredient in several laundry detergents on the Dutch market. Some major UK retailers have already committed to ensuring that their own brand cleaning products are free from microplastic ingredients.<sup>27</sup>

Although there is little publicly available evidence on the extent of microplastic ingredients in cleaning products on the UK market, given that there is evidence to suggest that they may be used now and in the future and that these products directly enter drainage, the ban should cover all products (including cleaning products) that enter drainage systems or are discharged directly or indirectly into the aquatic environment.

In order to meet the government's stated aims of environmental protection and levelling the playing field for industry, the ban should not target specific industry sectors but instead should apply to any products that could reach the marine environment, either through design or reasonably foreseeable use.

**c. Should any products be exempt from the ban? If so, please supply evidence to support your suggestions.**

There should be no exemptions from the ban. All microplastic ingredients have the potential to harm marine life. Consumers need to buy products with confidence, and will find it confusing if microplastic ingredients are banned from some products but not others, especially when (as outlined above) the distinction between 'rinse off' and 'leave on' is neither intuitive nor follows actual user behaviour.

**d. If products are not designed to go down the drain, but may still be disposed of in this way, what interventions or warnings are appropriate to protect the marine environment?**

Make-up is often categorized as a "leave on" product and industry has sometimes argued that this should not need to be included within the ban, because correct disposal is considered to be via removal using tissue/facial cleanser etc, which is then disposed of in the bin. However, the recent YouGov survey (referred to above) indicates that this is frequently not the case.

Additionally, the survey found that 59-65% of respondents (depending on type of make-up used) said they never or rarely check manufacturers' recommended instructions (e.g. on labels) on how to remove their make-up, so improved labelling is unlikely to be a solution.

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<sup>25</sup> FFI, 2017. Microbeads Guidance Document, Appendix 3, Appendix 4. Available at: <http://www.fauna-flora.org/wp-content/uploads/FFI-Microbeads-Guidance-Document-Appendix-3-January-2017.pdf>

And <http://www.fauna-flora.org/wp-content/uploads/FFI-Microbeads-Guidance-Document-Appendix-4-January-2017.pdf>

<sup>26</sup> Verschoor et al (2016). Emission of microplastics and potential mitigation measures - Abrasive cleaning agents, paints and tyre wear. RIVM Report 2016-0026. National Institute for Public Health and the Environment - Ministry of Health, Welfare and Sport: Bilthoven.

[http://rivm.nl/Documenten\\_en\\_publicaties/Wetenschappelijk/Rapporten/2016/juli/Emission\\_of\\_microplastics\\_and\\_potential\\_mitigation\\_measures\\_Abrasive\\_cleaning\\_agents\\_paints\\_and\\_tyre\\_wear](http://rivm.nl/Documenten_en_publicaties/Wetenschappelijk/Rapporten/2016/juli/Emission_of_microplastics_and_potential_mitigation_measures_Abrasive_cleaning_agents_paints_and_tyre_wear)

<sup>27</sup> <https://www.theguardian.com/environment/2016/nov/24/tesco-to-phase-out-microbeads-from-its-products>

We therefore propose that all products that frequently make their way to drainage or are discharged directly into aquatic environments, be it through design or user behaviour, should be included within the scope of the ban.

**e. How should compliance with the ban be monitored?**

Compliance with the ban should be monitored via trading standards or another statutory body. Currently NGOs monitor voluntary commitments but this is prohibitively expensive to continue indefinitely. There should be a legal requirement that compliance be monitored by a statutory agency.

**f. Our proposals for enforcement are set out at point (f) on page 9. We would welcome comments on our proposed approach, suggestions for alternative approaches and views on how enforcement of the ban can most effectively and proportionately be carried out? Details of the types of civil sanctions available are set out in the Regulatory Enforcement and Sanctions Act 2008 Part 3 Civil Sanctions sections in particular sections 39, 42 and 4612.**

Any sanctions must effectively change behaviour and have penalties – fines or civil sanctions – that are sufficiently onerous to deter companies from breaking the law. The sanctions must include penalties that are greater than the profits that companies make from the offending products to ensure that there is no longer any incentive for their sale.

**g. What costs and/or constraints would industry, including in particular small and medium-sized enterprises (SMEs), incur in meeting a ban on microplastics in cosmetics and personal care products?**

A significant number of producers – including multinational corporations and SMEs - have already reformulated their products, indicating that the costs are not prohibitive.<sup>28</sup> It should be noted that microbeads have only been used for the past couple of decades and therefore any products with equivalents that were in existence before that time can clearly be reformulated using alternatives that were available before microbeads.

However, there may be certain product categories where a longer time period prior to the introduction of a ban on manufacture or sale would be appropriate, to allow industry the time to find adequate alternatives. The vast majority of public pressure on the issue of microplastic ingredients has focused on personal care products such as face washes, where plastic particles are both visible and experienced tangibly. Industry has been working to find alternatives for microbeads in these products for some time, and therefore the proposed timeframe is completely achievable for phase out. This is not necessarily the case for all industries where microplastic ingredients are in use.

Under the proposed legislation individual industries should therefore be entitled to put forward their case for an extended phase-out period. It would then be up to Government to make a ruling on these proposals and to set the appropriate timeframe for that particular industry or product area.

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<sup>28</sup> EAC, 2016: <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/environmental-audit-committee/environmental-impact-of-microplastics/oral/34702.html>

This approach is much preferred over the Government's current proposal, which seeks to extend a ban only to one particular product area. By putting in place a ban that covers all product types, the Government would be taking a position that is both consistent with the available scientific evidence and is not prejudicial to one industry over another. By allowing industries the opportunity to apply for extensions to the phase-out period, the Government would be meeting its obligations to the environment and its stakeholders by making a clear commitment to eliminate marine pollution from microplastic ingredients, but would also be ensuring that businesses are given an achievable timeframe in which to make the necessary changes.

***h. To what extent will imports be affected by the ban? Please supply evidence to support your suggestions.***

Reformulations and bans are already being developed in other countries, including in major markets such as the U.S. and south east Asia, and therefore the impact is likely to be minimal.

***i. What are the risks that alternatives to microbeads will themselves have significant environmental impacts? If so, how could these risks be avoided, minimised or mitigated? Please supply evidence to support your suggestions.***

Guidelines should be introduced to eliminate risks of environmental impact from alternatives to microbeads. There is evidence to suggest that many commercially viable, non-plastic alternatives exist for use in exfoliating products marketed at both extremes of the industry (i.e. luxury products and affordable products), as illustrated in the Good Scrub Guide ([www.goodsrubguide.org](http://www.goodsrubguide.org)). Cited natural alternatives to microplastic ingredients for use in some leave-on products include, but are not limited to, mica, coloured clays and minerals such as kaolin and bentonite.

There is currently no clear evidence around how bioplastics or plastics labelled as biodegradable behave in the marine environment. Similarly, there are no globally accepted standards for marine biodegradability in relevant marine conditions. Therefore, they should not be considered suitable for emission to the marine environment and should not be included as an exemption.

For this reason, Defra should ensure that its microbead ban prohibits the use of any solid, water insoluble microplastic ingredients – with no exemption for biodegradable plastic alternatives – in products which could reach drainage or the aquatic environment and which would contribute to marine plastic pollution. We welcome that no such exemption is included in the proposed ban and urge the Government to adopt our suggested wording as laid out under 2(a) above.

## **ELUK response to Part 3: Gathering evidence to inform future UK action on marine microplastic pollution**

### ***a. Key sources of microplastics are set out in Part 3: Background. Are any missing or inappropriate? Please provide evidence to support your response.***

The sources set out in Part 3 of the consultation document cover the majority of the known key sources of primary microplastics, with the addition of plastic fibres included in domestic and industrial cleaning wipes and biobeads from sewage treatment works. There are numerous sources of secondary microplastics. These include, but are not limited to, bottles and caps, other plastic packaging such as food wrappers and containers, single-use plastics such as straws, cups, plastic cutlery and plastic bags, and sewage-related items such as cotton buds, wet wipes and sanitary products. Over time these larger plastic items fragment in the environment because of biological, physical and chemical deterioration as well as through exposure to sunlight.

A recent study estimated that European countries discharge between 80,042 and 218,622 tonnes of microplastics and between 68,500 and 275,000 tonnes of macroplastics into the marine environment annually. This equates to a total of between 148,500 and 494,000 tonnes per year.<sup>29</sup> Thus, macroplastics may indirectly provide as great a source of microplastics to aquatic environments through degradation, as direct sources of primary microplastics. In addition, microplastic pollution isn't an issue limited to the marine environment; microplastics have also been identified in freshwater rivers and lakes<sup>30</sup> and in soil, due to the application of sewage sludge and compost containing microplastics. Efforts to prevent microplastic pollution should therefore address terrestrial, freshwater and marine environments.

### ***b. Which sources of microplastic pose the greatest risks to the marine environment? Please provide evidence to support your response.***

While an assessment of risk would typically be based on both the relative magnitude of different sources of microplastic to the marine environment<sup>31</sup> and the potential for harm from each source, the complexity of microplastic pollution characteristics (e.g. size, shape, polymer, chemical additives) make it difficult to comprehensively assess the potential for harm from different sources. The type and characteristics of microplastics vary within and between discrete source categories. Pre-production plastics, for example, vary in shape (pellet, powder or flake), size, colour, density and composition. The precise effect will vary depending on which marine organism they interact with and the environment they reside in<sup>32</sup>. Furthermore, many plastics contain additives that can leach out of the plastics upon

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<sup>29</sup> Sherrington, et al. 2016. Study to support the development of measures to combat a range of marine litter sources. Report for European Commission DG Environment. 432 pp.

<sup>30</sup> E.g. Rhine, Germany: Mani et al. 2015. Microplastics profile along the Rhine River. Scientific Reports, 5, 17988; Austria: Lechner and Ramler (2015). The discharge of certain amounts of industrial microplastic from a production plant into the River Danube is permitted by the Austrian legislation. Environmental Pollution, Vol. 200. Pp.159-160; Italy: [Microplastic within Italian lakes – Legambiente 2016](#).

<sup>31</sup> Sherrington et al. 2016. Study to support the development of measures to combat a range of marine litter sources. Report for European Commission DG Environment. 432 pp.

<sup>32</sup> Wright, S.L., Thompson, R.C., Galloway, T.S. (2013) [The physical impacts of microplastics on marine organisms: A review](#) Environmental Pollution 178: 483-492

ingestion or into seawater, and have the potential to impact marine species.<sup>33</sup> The concentration and composition of these chemicals are dependent on the plastic type and intended use. In addition, microplastics are efficient at adsorbing toxic chemicals from their surroundings.<sup>34</sup> How the plastics interact with these chemicals will not only depend on the plastic type,<sup>35,36</sup> but also on the pollutant levels of their surroundings, and residence time at sea. Transfer of toxins to the animals that eat them also depends on the gut conditions of the ingesting animal.<sup>37</sup>

Overall, at the current time, the assessment of risk for primary microplastics should therefore be based on the relative magnitude of each source, as estimated and ranked in recent reports, which identify vehicle tyre dust, pellet spills and textiles as the top three sources of primary microplastics.<sup>38</sup> With regard to macroplastics, these may be more readily assessed for their relative risk and severity of harm to marine life, and may pose a risk both in their macroplastic form and as they fragment over time, as a source of secondary microplastics.

**c. How should sources be prioritised for action? Please explain your response.**

The prioritisation of sources should be included in a holistic strategy for eliminating sources of plastic pollution (primary & secondary sources) in the UK, with prioritisation based on a combined assessment of (i) their relative magnitude based on scale of known emissions; (ii) risk perception and the best available evidence of the harm they cause to marine, freshwater and terrestrial ecosystems; and (iii) the availability of solutions and opportunities for quick wins. There are a number of actions that can be taken immediately to reduce the input of microplastics to the marine environment. ‘Easy win’ actions for which there are already practicable solutions, such as banning microplastic ingredients, stopping the loss of pre-production plastics to the environment and implementing a deposit –return scheme for single use drinks containers, should be carried out first while devising strategies for dealing with the more difficult sources e.g. tyre particles.

Where possible, primary and secondary microplastic pollution should be tackled at source given that prevention is technically and economically more feasible and effective than remediation.

**d. What possible interventions could be developed to reduce these risks and how might the cost of these interventions be minimised? What is the likely impact on industry of these interventions? Please explain your response.**

The interventions required to eliminate plastic pollution vary according to source. Here we give suggested interventions for certain sources of primary and secondary microplastics, noting that this is

<sup>33</sup> Gandara e Silva, P.P., Nobre, C.R., Resaffe, P., Pereira, C.D.S., Gusmão, F., 2016. Leachate from microplastics impairs larval development in brown mussels. *Water Research* 106, 364–370. doi:10.1016/j.watres.2016.10.016

<sup>34</sup> [www.pelletwatch.org](http://www.pelletwatch.org)

<sup>35</sup> Isabel A. O'Connor, Laura Golsteijn, A. Jan Hendriks, Review of the partitioning of chemicals into different plastics: Consequences for the risk assessment of marine plastic debris, *Marine Pollution Bulletin*, Volume 113, Issues 1–2, 15 December 2016, Pages 17-24, <http://dx.doi.org/10.1016/j.marpolbul.2016.07.021>.

<sup>36</sup> Defra 2016 – ME5416 Potential for microplastics to cause “harm” in the marine environment.

<sup>37</sup> Op. cit. (Defra 2016)

<sup>38</sup> Sherrington, et al. 2016. Study to support the development of measures to combat a range of marine litter sources. Report for European Commission DG Environment. 432 pp.

not an exhaustive list of actions and reflects the expertise and focus areas of the signatory organisations.

### **Pre-production plastics**

Pre-production plastics are the raw material used to make most plastic products. This raw material is transported to manufacturers as pellets (also known as nurdles), flakes and powders. Plastic pellets are the most widely used and easiest to spot when spilt into the wider environment.

If not dealt with correctly, spilt plastic pellets, flakes and powders can find their way to sea via drains and watercourses. Around 2.5 million tonnes of plastic materials are produced, and 4.8 million tonnes processed in the UK each year.<sup>39</sup> According to recent analysis, pre-production plastic pellet loss to the environment in the UK is likely to be at least 105 tonnes, and possibly as high as 1,054 tonnes each year. Although this is only a tiny fraction of the material handled, this equates to 5 billion and 53 billion pellets per annum respectively.<sup>40</sup> This estimate is among the most conservative compared to other European studies and does not attempt to estimate the quantity of plastic flakes and powders entering the marine and wider environment. Across Europe, pellet loss is estimated to be the second largest primary source of microplastics, estimated at 230 million tonnes per year.<sup>41</sup>

Plastic pellets pollute the coastline of the UK and further afield.<sup>42</sup> Data collated by Fidra and supporting organisations only covers pellet pollution, and does not provide an indication of the scale of plastic flake or powder pollution. Analysis of this data has identified pellet pollution hotspots.<sup>43</sup> Between 3-5 February 2017, ca. 600 members of the British public took part in The Great Winter Nurdle Hunt; of the 279 hunts conducted, from Shetland to the Isles of Scilly, pellets were recorded on 205 beaches (73% of hunts). The information collected gives a clear indication of the prevalence of pellet pollution around the UK coastline.

Pellets have been specifically noted in the stomach contents of a number of seabirds including Fulmars<sup>44</sup>, Puffins<sup>45</sup>, the Common gull<sup>46</sup> and Cory's shearwater<sup>47</sup>. They have been observed in the regurgitated pellets of terns,<sup>48</sup> and the predatory Great Skua, which is an indication that pellets have been transferred up the food chain.<sup>49</sup> Pellet ingestion has also been observed under laboratory conditions in sea-cucumbers,<sup>50</sup> domestic chickens,<sup>51</sup> and Japanese medaka (rice fish).<sup>52</sup> Ingestion in domestic chickens was shown to reduce normal feeding and limit growth, evidence of which can also be observed in seabirds in the wild. Like other microplastics, pellets can adsorb persistent organic pollutants to their surface and have been known to concentrate toxins to levels millions of times higher

<sup>39</sup> About the British Plastics Industry [online] <http://www.bpf.co.uk/industry/default.aspx> (Accessed 05/09/2016)

<sup>40</sup> Eunomia (2016) [http://www.nurdlehunt.org.uk/images/Leaflets/Pellet\\_loss\\_report\\_2016](http://www.nurdlehunt.org.uk/images/Leaflets/Pellet_loss_report_2016)

<sup>41</sup> <http://www.eunomia.co.uk/reports-tools/plastics-in-the-marine-environment/>

<sup>42</sup> <http://www.nurdlehunt.org.uk/take-part/nurdle-map.html>

<sup>43</sup> <http://www.nurdlehunt.org.uk/take-part/the-great-winter-nurdle-hunt.html>

<sup>44</sup> Van Franeker, J. A., & Law, K. L. (2015). Seabirds, gyres and global trends in plastic pollution. *Environmental Pollution*, 203, 89-96.

<sup>45</sup> Harris M.P. , Wanless S., 1994, Ingested elastic and other artifacts found in puffins in Britain over a 24-year period, *Marine Pollution Bulletin*, 5, Issue 3, 44-46

<sup>46</sup> Robards M.D., Piatt J.F., Wohls K.D., 1995, Increasing frequency of plastic particles ingested by seabirds in the subarctic north Pacific, *Marine Pollution Bulletin*, Vol 30 No 2 151-157

<sup>47</sup> Rodríguez A., Rodríguez B., Carrasco M. N., 2012, High prevalence of parental delivery of plastic debris in Cory's shearwaters (*Calonectris diomedea*), *Marine Pollution Bulletin*, 64, Issue 10, 2219-2223

<sup>48</sup> Hays H., Cormons G., (1974) Plastic particles found in tern pellets, on coastal beaches and at factory sites. *Marine Pollution Bulletin*, 5, Issue 3, 44-46

<sup>49</sup> Hammer, S., Nager, R.G., Johnson, P.C., Furness, R.W., Provencher, J.F. (2016) Plastic debris in great skua (*Stercorarius skua*) pellets corresponds to seabird prey species, *Marine Pollution Bulletin*, 103(1-2):206-10

<sup>50</sup> Graham, E. R.; Thompson, J. T, 2009, Deposit- and suspension-feeding sea cucumbers (*Echinodermata*) ingest plastic fragments, *Journal of Experimental Marine Biology and Ecology*, 368 22-29

<sup>51</sup> Ryan, P. G. (1988). Effects of ingested plastic on seabird feeding: evidence from chickens. *Marine Pollution Bulletin*, 19(3), 125-128.

<sup>52</sup> Rochman, C. M., Hoh, E., Kurobe, T., & Teh, S. J. (2013). Ingested plastic transfers hazardous chemicals to fish and induces hepatic stress. *Scientific reports*, 3.

than surrounding water.<sup>53</sup> Laboratory experiments have observed toxin transfer from ingested pellets to Japanese Medaka causing liver damage<sup>54</sup>. Two recent studies indicate that leachates from the plastic (both additives and adsorbed pollutants), can have significant effects on filter feeding organisms feeding close to the pellets; sea urchin<sup>55</sup> and mussel<sup>56</sup> embryos growing close to pellets were shown to be significantly impaired in their development. These studies demonstrate that pre-production plastic pellets can cause harm to marine life both by ingestion and leaching of associated chemicals. In fact, some regulation already defines them as hazardous, for example pellets are specifically mentioned in MARPOL annex V as a hazardous cargo due to their threat to marine life.<sup>57</sup>

Although there is an existing voluntary industry-devised scheme, [Operation Clean Sweep, \(OCS\)](#) intended to prevent the loss of preproduction plastics (pellets, flakes and powders), the abundance and extent of plastic pellets on the UK coastline indicates that the scheme has failed to eliminate pollution by pre-production plastics. Under Operation Clean Sweep, companies voluntarily pledge to prevent pellet loss and are provided with guidelines and check-lists to help achieve this. However, sign up remains low (ca. 1% of the UK plastic industry is signed up to Operation Clean Sweep according to published statistics) and many companies are unaware of its existence or are unwilling to commit to the pledge. Furthermore, without any external auditing or reporting requirements, the level of compliance is varied; some companies take their responsibilities seriously<sup>58</sup> by taking all reasonable measures to prevent spills into the environment while others continue as before.

The steps below identify a route to prevent further pre-production plastic (pellets, powders & flakes) pollution in a timely and comprehensive manner<sup>59</sup>:

1. Government should identify suitable regulatory measures to prevent the loss of pre-production plastics in order to provide a mechanism by which to enforce compliance, in particular to determine whether the Waste Duty of Care under the Environment Protection Act can be used as a means to require those who handle pre-production plastics to take all reasonable steps to prevent the escape of pre-production plastics from their control.
2. In parallel, as an immediate interim measure that can be undertaken without delay, Government should challenge industry to develop ‘enhanced voluntary measures’ and set a timetable to demonstrate these are in place and a process by which to monitor their effectiveness (e.g. through reporting and independent auditing). With clear government backing, the industry could more broadly incorporate the scheme into best-practice standards and enhance it so that it is fit-for-purpose across the value-chain and assessed through independent auditing and reporting. These improvements should be developed in consultation with government and other relevant stakeholders and could include the development of an appropriate industry standard (e.g. BRC Global Standards, ISO, CEN).
3. Government should review the effectiveness of ‘enhanced voluntary measures’ once implemented to assess if further regulation is needed. Such regulatory action could enforce existing legislation or create specific new legislation if required. This latter stage will support

<sup>53</sup> Mato, Y., Isobe, T., Takada, H., Kanehiro, H., Ohtake, C., Kaminuma, T., 2001. Plastic resin pellets as a transport medium for toxic chemicals in the marine environment. *Environmental science & technology* 35, 318–324.

<sup>54</sup> See ref. 13

<sup>55</sup> Nobre, C.R., Santana, M.F., Maluf, A., Cortez, F.S., Cesar, A., Pereira, C.D., Turra, A. (2015) Assessment of microplastic toxicity to embryonic development of the sea urchin *Lytechinus variegatus* (Echinodermata: Echinoidea) *Marine Pollution Bulletin* 92(1-2):99-104

<sup>56</sup> Gandara e Silva, P.P., Nobre, C.R., Resaffe, P., Pereira, C.D.S., Gusmão, F., 2016. Leachate from microplastics impairs larval development in brown mussels. *Water Research* 106, 364–370. doi:10.1016/j.watres.2016.10.016

<sup>57</sup> MARPOL Annex V: [Prevention of Pollution by Garbage from Ships](#). 3.2.7 – solid bulk cargoes containing or consisting of synthetic polymers, rubber, plastics, or plastic feedstock pellets

<sup>58</sup> <http://www.nurdlehunt.org.uk/whats-the-solution/nurdle-case-studies.html>

<sup>59</sup> <http://www.nurdlehunt.org.uk/images/Fidra---Pellet-Loss-Prevention-Options---Final.pdf>

early adopters of the scheme as it will ensure a level playing field.

Challenging industry to develop its own enhanced voluntary measures will place responsibility and potential costs on industry. However, the best-practice measures set out in OCS are designed to be low cost and easy to implement. The additional work to demonstrate these measures are in place should not be excessive and could be designed to complement existing reporting and auditing procedures companies already adhere to. The cost to industry will only apply to that section of the industry that has not already applied best-practice measures. However, given the poor uptake of existing voluntary schemes across the supply chain, legislation (existing or new) may likely be required in order to ensure this source of microplastic pollution is eliminated. Such legislation would support those who adopted the scheme initially and ensure practices were applied broadly to the full plastics value chain.

### ***Microfibres from textiles***

Microfibres from textiles are considered to be the third largest source of primary microplastics, contributing 190,000 tonnes to the marine environment per annum within Europe.<sup>60</sup> More than 700,000 microscopic plastic fibres could be released during each use of a washing machine.<sup>61</sup> In order to reduce input into the marine environment, it is necessary to look at ways of producing textiles which release fewer microfibres and at washing machine and other technology which could prevent their discharge, such as the recently developed laundry bag.<sup>62</sup> For example, tumble driers are fitted with air filters which prevent or limit discharge of fibres, but there does not appear to be any similar provision for the “wet” phase of laundering. Government should support the development and implementation of such solutions.

### ***Microplastics from Commercial Fishing Equipment***

Ropes and nets used during normal fishing activities are now made from plastics. These fray and fragment over time creating marine plastic pollution. In addition some dredging nets incorporate “chafers”, multistrand polypropylene rope bundles attached to the leading lower edge of the net. The chafers’ role is to protect the net from the benthic surface and it is designed to disintegrate as it is used. Plastic fragments arising from fishing gear are an important component of the plastic that is found in the stomachs of Nephrops in UK waters.<sup>63</sup> Defra should undertake a review of plastic pollution from the fishing industry to identify the most effective ways that this can be limited or eliminated. In particular chafers made from artificial fibres should be phased out and replaced with chafers made from biodegradable natural fibres. Other actions may arise from the review and these should be implemented through industry cooperation, licence conditions and regulation as necessary.

### ***Biobeads from sewage treatment plants***

Biobeads are plastic pellets of similar size and shape to nurdles, but created as a finished product for use in tertiary BAFF (Biological Aerated Flooded Filter) sewage treatment plants. The pellets are often made of recycled plastic and have a very rough surface texture compared to virgin resin pellets. A huge number of such biobead pellets have been found on the Cornish coastline, mixed in with other nurdles. It is unclear how these biobeads have reached the sea. Mesh screens should be able to stop pellets escaping sewage treatment works, however it has been suggested by suppliers that top-ups are

<sup>60</sup> Sherrington, C., Darrah, C., Hann, S., Cole, G. & Corbin, M. 2016. Study to support the development of measures to combat a range of marine litter sources. Report for European Commission DG Environment. 432 pp.

<sup>61</sup> Napper, I.E. & Thompson, R.C., 2016. Release of synthetic microplastic plastic fibres from domestic washing machines: Effects of fabric type and washing conditions. *Marine pollution bulletin*, 112(1), pp.39-45.

<sup>62</sup> <https://www.theguardian.com/sustainable-business/2017/feb/12/seafood-microfiber-pollution-patagonia-guppy-friend>

<sup>63</sup> Murray, F., Cowie, P.R. (2011) Plastic contamination in the decapod crustacean *Nephrops norvegicus* (Linnaeus, 1758). *Mar. Pollut. Bull.* doi:10.1016/j.marpolbul.2011.03.032

required, indicating that losses do occur. This is a newly identified potential source of microplastics to the environment that has only recently been discovered and the Government should support further work to determine the extent and magnitude of this source and preventative measures.

### ***Sewage-related plastics***

Sewage-related plastics such as cotton buds, wet wipes and sanitary items comprise around 7% of beach litter, of which more than 50% comprises plastic cotton buds. Even the finest sewage screen mesh sizes of 3mm do not retain all plastic cotton buds which have a diameter of about 2mm. Cotton buds and other sewage-related waste enters the marine environment with untreated sewage through combined sewer overflows as a result of blockages or during storm events, at relatively high frequency.<sup>64</sup>

Despite having been recognised as a problem for at least 20 years, significant numbers of plastic cotton bud stems have been recorded on beaches worldwide as a component of sewage related debris.<sup>65</sup> As a result of NGO campaigns, some retailers and manufacturers have already made significant steps to addressing this issue by switching plastic cotton bud stems for plastic-free alternatives that fully biodegrade.<sup>66</sup> Some countries, such as France, have banned the use of plastic in cotton buds.<sup>67</sup>

Government should challenge industry to redesign such personal care/sanitary items to exclude plastic and to improve labelling and communication campaigns to encourage customers to dispose of cotton buds and other sanitary waste in household rubbish and not down the toilet. This could include creation of a cross-stakeholder forum to progress action on this issue. If progress is insufficient, Government could consider banning the use of plastic in such items, as in France.

### ***Plastic bottles***

UK beach litter data shows that beverage containers (plastic bottles and lids, glass bottles and aluminium cans) made up ~10% of all litter and over a quarter of all public litter.<sup>68</sup> Recycling rates in the UK are now increasing only very slowly and further actions are needed to reduce this source of plastic pollution.<sup>69</sup> The UK has reduced its plastic recycling targets for 2016-20 due to industry concerns over the difficulty in achieving these targets. Studies from around the world have shown that a Deposit Return Scheme (DRS) increases high quality recycling and leads to a reduction in litter over all.<sup>70</sup> The introduction of Deposit Return Schemes has caused recycling rates to increase to above 80% in the countries and regions where they operate, and to over 95% in Germany, the Netherlands and Norway. A 2005 study for Defra found that DRS could reduce littering of plastic bottles by more than 80%.<sup>71</sup>

In the UK alone, 35 million plastic bottles are bought every each day, equivalent to 200 per person every year – but 44% of these are not recycled.<sup>72</sup> There is therefore significant potential for the UK Government to introduce supportive measures to boost recycling rates of plastic bottles in Britain, and reduce the 15 million unrecycled bottles that are at risk every day of getting into the ocean.

Studies have shown that far from losing revenue due to reduced material stream collections, DRS can actually save Local Authorities money through reduced operating costs and logistics, as well as reducing greenhouse gas emissions, as a significant percentage of low density, bulky material no longer needs to

<sup>64</sup> [www.scottishwater.co.uk/assets/about%20us/files/strategic%20projections/appendix8improvingwastewaterservice.pdf](http://www.scottishwater.co.uk/assets/about%20us/files/strategic%20projections/appendix8improvingwastewaterservice.pdf)

<sup>65</sup> [www.thegef.org/gef/pubs/STAP/marine-debris-defining-global-environmental-challenge](http://www.thegef.org/gef/pubs/STAP/marine-debris-defining-global-environmental-challenge)

<sup>66</sup> <http://www.cottonbudproject.org.uk/>

<sup>67</sup> <http://www.cottonbudproject.org.uk/news/item/35-france-cotton-bud-ban.html>

<sup>68</sup> Marine Conservation Society (2016) Great British Beach Clean 2016 results

<sup>69</sup> RECOUP (2016) UK Household Plastics Collection Survey

<sup>70</sup> Oosterhuis, F., Papyrakis, E., Boteler, B. (2014) Economic Instruments and marine litter control. Ocean and Coastal Management (102)47-54

<sup>71</sup> Perchards (2005) Deposit Return Systems for Packaging: Applying International Experience to the UK. Peer Review of a Study by Oakdene Hollins. Report to Defra.

<sup>72</sup> Recycle Now campaign, funded by WRAP

be collected at the kerbside.<sup>73</sup> Research in Scotland that examined the overall financial benefits for Scottish Councils from a national DRS estimated that Scotland's 32 local authorities would collectively save £13m each year. The largest single item would be a saving of £7m associated with reduced litter picking, followed by a saving of £5m on the cost of kerbside recycling, and a final £1m reduction in costs for household waste recycling centres.<sup>74</sup>

We recommend that a DRS for single use drinks containers such as plastic and glass bottles, and aluminium cans be implemented across the UK.

### ***Other plastic packaging and single-use plastics***

Plastics that are designed to be disposable - e.g. food, beverage and other packaging and fast-food items – are often most likely to be disposed of inappropriately and find their way into the marine environment and account for over 20% of UK beach litter.

Actions to limit the use of these single use plastics and packaging could result in major reductions in plastic pollution, backed up by pressure both to improve the percentage of plastics which can be routinely reused and recycled and to improve the mechanisms and economic incentives for their collection. Adopting such measures within circular economy legislation, or through other instruments, is fundamental to achieving reductions in sources of macroplastic pollution. A circular economy maximises the sustainable use and value of resources, eliminating waste, and benefiting both the economy and the environment. Example measures should include:

- Bans on specific single-use plastics (e.g. plastic cutlery and straws, plastic dog poo bags) and elimination and replacement of certain packaging types which are difficult to recycle (e.g. polystyrene, PVC packaging).
- Adoption of mandatory requirements for packaging that ensure design for reuse and recycling, including restriction of polymer types and colours and minimum recycled content.
- Increased collection (e.g. through deposit-refund schemes and extended producer responsibility (EPR)).
- Implementation of deposit return schemes for single-use drinks containers across the UK.
- Extension of the English plastic bag charge to cover all retailers and all single use bags.
- Improved mandatory requirements for EPR schemes that include full coverage of the entire cost of waste management for products placed on the market and fee modulation based on the real end-of-life cost of products, taking into account their re-usability, recyclability recycled content and rate of littering.
- Adoption of ambitious UK targets for reduction of plastic packaging waste and targets for reuse, recycling and minimum recycled content. These should be at least as ambitious as those agreed in ongoing negotiations on the EU Waste Directives. Plastic packaging recycling business targets should be increased.

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<sup>73</sup> Hogg, D., Fletcher, D., Elliott, T. von Eye, M. (2010). Have We Got the Bottle? Implementing a Deposit Refund System in the UK: A report for the Campaign to Protect Rural England. <http://www.cpre.org.uk/resources/energy-and-waste/litter-and-fly-tipping/item/1918-have-we-got-thebottle>

<sup>74</sup> Hogg, D., Elliott, T., Gibbs, A., Jones, P., von Eye, M., Hann, S. (2015) A Scottish Deposit Refund System. A report for Zero Waste Scotland