MICROPLASTIC POLLUTION FROM PELLET LOSS

BRIEFING BY FAUNA & FLORA INTERNATIONAL (FFI) AND FIDRA
NOVEMBER 2017

THE PROBLEM?

- Pre-production plastics such as pellets (or 'nurdles'), powders and flakes are the raw material used to make virtually all plastic products. Pellets are about the size of a lentil with a diameter of 2-3mm, and fall within the upper size range of microplastics.
- Pellets can be made of different polymers such as polyethylene, polypropylene, polystyrene (non-expanded), PVC and acrylics. Pellets can include additives of varying toxicity e.g. pigment, filler and plasticisers, which are known to leach out once in the sea[1].
- As a result of poor handling and transportation practices spilt pellets reach drains, rivers and eventually the sea.
- Pellets escape at various stages of industrial processes (including pellet manufacture, conversion into different plastic items and recycling); they may be spilt within factories and purposefully swept or washed down the drain, they may be lost when bags tear during haulage or lost at sea when containers are unsecured.
- In the marine environment pellets are known to attract and concentrate Persistent Organic Pollutants (POPs) to over 1 million times background levels[2].


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- Pellets are the second largest direct source of microplastic pollution (by weight) in the marine environment[3].
- Pellet pollution is an international problem, being reported on the coastlines of all North Sea coastal countries and every European country where monitoring has taken place[4].
- There is evidence of pellets being ingested by a range of marine life from fish species (such as Japanese medaka) and seabirds (including fulmars and puffins).
- Experiments have shown that pellet ingestion can harm feeding and growth and induce toxicological stress in the internal organs of fish and bird species[5,6].


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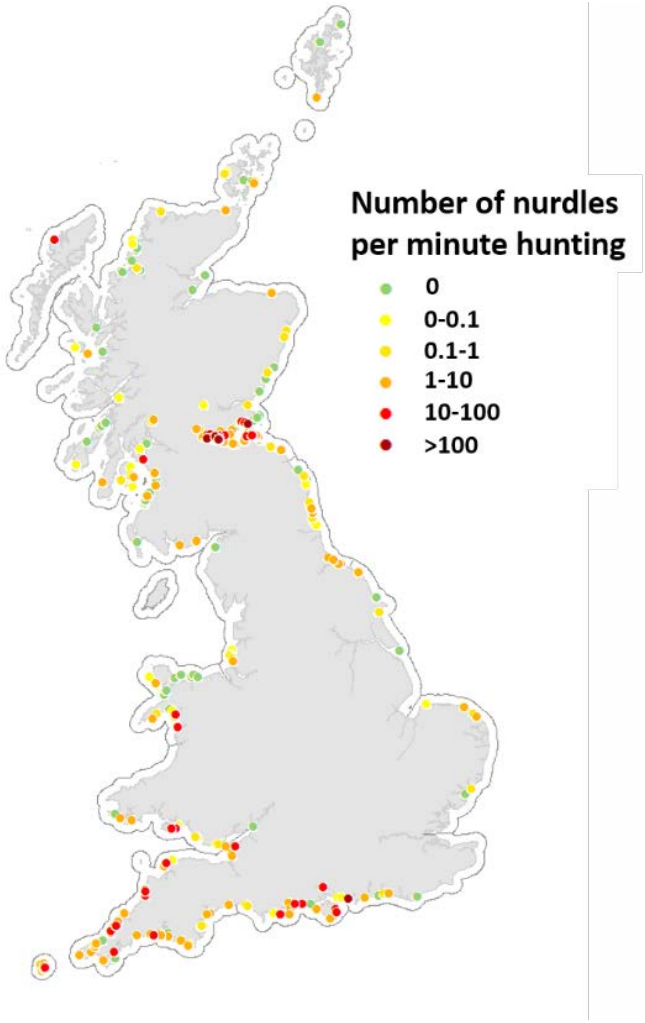
THE EXTENT OF PELLET POLLUTION IN THE UK

Over the last six years, a citizen-science project (The Great Nurdle Hunt) has demonstrated the prevalence of pellet pollution around the shores of the UK. While beach-based pellet pollution is substantial, this is only an indicator of the numbers of suspended pellets floating in our seas. Off-shore microplastic surveys commissioned by Defra have also revealed that 10% of the microplastic collected in the North Sea was pellets.

Information collected from the British coastline through Fidra's Great Nurdle Hunt project has shown hotspots of pellet pollution, some of which are associated with industrialised estuaries. The map opposite shows an illustration of relative density of pellet pollution records (based on number of nurdles counted within a minute of searching) - areas without records have not yet been surveyed.

Some 540,000 nurdles have been recovered in a single beach clean.



A Fidra-commissioned study estimates pellet loss in the UK at up to 1,054 tonnes, or 53 billion pellets, per year[7].

SOLUTIONS EXIST

- The US plastic trade association developed a set of low-cost guidelines called Operation Clean Sweep in 1991 to help companies avoid pellet spills in the workplace and encourages companies to pledge to work towards zero pellet loss. The Operation Clean Sweep guidelines are designed to apply to all industrial facilities and stages of pellet handling (including during transportation).

Operation Clean Sweep®

- Operation Clean Sweep has since been endorsed and promoted by Plastics Europe and the British Plastics Federation. If implemented, these guidelines could substantially reduce the risk of pellet loss to UK waters.
- Work with a range of retailers over the last four years has demonstrated an appetite for supply-chain based responsibility on pellet loss; however the retailers themselves recognise that there are current inadequacies in Operation Clean Sweep.

CURRENT LIMITATIONS

- Operation Clean Sweep is a voluntary scheme. To date only 80 companies within the UK have signed up to adopt these guidelines to avoid pellet loss; despite active and constructive engagement by Fidra and FFI with the industry federations and with individual companies only 47 additional sign ups have been made since 2010. Around 6,200 firms are engaged in the UK plastics industry[8], and this figure does not include the full value chain, e.g. transport and logistics.
- The current absence of annual progress reports and independent third-party auditing limits transparency and the ability to assess overall effectiveness of the scheme. Retailers interested in ensuring that pellet loss is not a consequence of their operation are looking for assurance on this matter.

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CURRENT WORK

- Work is underway to develop retailer-led standards for pellet management, however the lack of clear policy frameworks around pellet loss hinder a coherent approach.
- Efforts to promote a voluntary industry-led approach to addressing pellet loss have had limited uptake from industry, necessitating statutory intervention to incentivise change.
- The European Commission is considering possible interventions on pellet loss within their upcoming Strategy on Plastics in a Circular Economy.
- Development of legislative frameworks may be a necessary step to stimulate and facilitate effective supply-chain based approaches to pellet loss; without a level playing field the effectiveness of a voluntary approach may be limited.
- FFI, Fidra and a wider European Pellet Loss Coalition have laid out a series of specific recommendations to develop an effective approach to stop the unnecessary escape of pellets to our waterways and oceans (listed overleaf).
- As part of its response to the Microbead Consultation the UK government committed to gathering evidence to inform future UK action on marine microplastic pollution and responded that *"We are discussing with environmental groups and research institutes how best to address pre-production pellet (nurdle) loss, such as by supporting the plastics industry to sign up to Operation Clean Sweep, an initiative to implement good practice aimed at reducing the loss of preproduction pellets during transport and use".*

278 pellets have been found in the stomach of a single fulmar

Pellets can carry a million times more toxins than seawater

The USA alone produces ~ 2.3 quadrillion pellets every year

Pellet loss in Europe is estimated at 1.2 trillion pellets per year

It is the second biggest source of microplastic litter by weight

On some European beaches, studies have found 3 parts pellets to 1 part sand

Known hotspots include estuaries in Scotland, France, Netherlands and Norway

It takes around 600-1200 pellets to make a plastic water bottle

NEXT STEPS

The UK Government (Defra's Minister Thérèse Coffey) made a public commitment to support eliminating pellet loss through Operation Clean Sweep at the recent Our Ocean conference (Malta, October 2017). We now hope to see this commitment confirmed in writing, and continue to work closely with Defra in the hope that the Government can ensure that industry does address material losses to the environment across the plastics supply chain. The UK has the unique opportunity to become a world leader in addressing this major threat to marine biodiversity.

As a matter of urgency, Fidra and FFI recommend the UK Government to put necessary measures in place to ensure that all pre-production plastics are handled responsibly across the international plastic value chain.

We favour a supply-chain approach that provides assurances that all plastic items placed on the market at all stages of the value chain are produced and handled by conscientious companies with high standards of practice in place to prevent loss of pellets, powders and flakes.

This would allow retailers and brand-owners to check their plastics supply chain for responsible handling of pre-production plastics, as part of existing responsible sourcing protocols.

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Well-designed and fully implemented legislation could effectively reinforce and build upon current voluntary efforts brought about by OCS if it:

- Ensures best practice is in place as standard across the full plastics value chain, reaching all companies that handle plastic pellets;
- Includes an independent auditing and reporting mechanism to ensure effective implementation of measures;
- Creates a level playing field by applying to all companies involved in handling pre-production plastics;
- Complements existing voluntary efforts to ensure zero pellet loss.

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