

## **Executive summary**

This report summarises the key findings on marine litter found on eleven reference beaches around Northern Ireland in 2019. Data has been collected since 2012 using the internationally recognised OSPAR methodology.<sup>1</sup>

This year there is a focus on the emerging issue of microplastics, in particular their origins, impacts and harm to both marine wildlife and ourselves. Annually it has been estimated between 5–13 million tonnes of plastic waste is entering our oceans with approximately 80% of this originating from land-based sources.<sup>2</sup>

In 2018 there were 359 million tonnes of plastic produced globally (up from 348 million in 2017).<sup>3</sup> In Europe alone in 2018 there was 61.8 million tonnes of plastics produced of which around 9.4 million tonnes were collected for recycling according to Plastics Europe.<sup>3</sup> Plastic was designed for its long lasting durability. Although it can breakdown into smaller pieces when exposed to certain conditions in the environment, it never truly degrades completely. Ironically it is this useful quality, that poses such a threat to the environment.

This year single use plastics were among the most commonly recorded items. On average 20 drinks containers and 27 caps and lids were found per 100 metres surveyed. Additionally short pieces of string, cord and rope were found across the beaches with an average of 67 lengths of string (<1cm diameter) and 24 lengths of rope (>1cm diameter) counted per survey. These are most commonly associated with fishing gear.

#### Key facts from 2019:

508

items of litter, on average, were recorded per 100 metres of beach surveyed

22,338



items of litter recorded across ● 11 beaches

78% of all litter was plastic

1,189

heavy duty gloves were recorded



597

547

1,301

volunteers



bags collected



volunteer hours



Since the onset of the COVID 19 pandemic people are taking extra steps to protect themselves. It is important that the public recognise that using Personal Protective Equipment comes with the responsibility of not just using it properly but also disposing of it in a way that doesn't harm the environment and other members of the public. These items once done with, need to be put in the appropriate bin

## **Foreword**

#### The BIG Issue

When Dr Who covers the stupidity of our self-made pollution, by cutting open a bird stomach full of plastic, you know this issue is now mainstream news. It has come a long way even from the days of Blue Planet II. But the issue isn't science fiction; it is reality today, with 78% of beach litter made of plastic and four fifths of beach litter coming from the land.

#### The Facts

Much of the litter is made up of single use items. These are often used to protect food or package food and, once purchased, are discarded within minutes or even less. Often the items are discarded without thought and end up in the sea; and as we know, at least 31% of the Northern Ireland public admit to littering. So even if they just littered one item a day that would mean over 200 million items littered every year in NI. No surprise then that we have an estimated 3.3 million items of litter on our coastline at any one time (and a further 1.3 million on our streets).

#### **Pollution Solutions**

So tackling the issue is a serious challenge, and one that DAERA began addressing with the Marine Litter Strategy in 2013. Clean-ups have also contributed massively by removing well in excess of a million items of litter from the survey beaches. Ultimately though, we need to stop people dropping

It is this mass mobilisation of not just a 'can do spirit' but also the growth of a 'we care attitude' that gives me hope for a better cleaner more sustainable future.

litter in the first place. For the public, changing behaviour, changing societal norms (for many) and changing how we value our environment will be key components to any successful campaign. For businesses, changing packaging to be less environmentally damaging and supporting the introduction of legislation to help recover packaging are important. And finally, scale is needed if the messages are to be present in sufficient volume across the various media to create a lasting difference.

#### Why Bother?

There are those who say why bother, when Northern Ireland is such a small part of what is a massive global problem? Keep Northern Ireland Beautiful believes there are several important reasons why we need to bother:

- there is a moral obligation to keep our own house in order and play our part,
- there is an environmental obligation to keep where we live in a state we can be proud of and pass on unharmed to future generations to enjoy and earn a living from, and
- there is a societal obligation to create stronger values that protect the environment, build community self- efficacy and create a place where money is not the sole measure of success.

This report provides the best source of information on the scale of the problem, but also some of the ways people are taking positive action. It is this mass mobilisation of not just a 'can do spirit' but also the growth of a 'we care attitude' that gives me hope for a better cleaner more sustainable future.



**Dr. lan Humphreys**CHIEF EXECUTIVE,

CHIEF EXECUTIVE, KEEP NORTHERN IRELAND BEAUTIFUL

## **OSPAR**

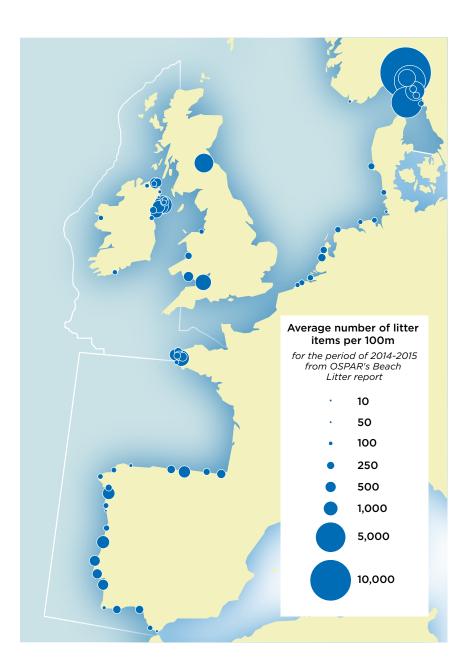
# OSPAR is the mechanism by which 15 Governments and the EU cooperate to protect the marine environment of the North-East Atlantic.

OSPAR started in 1972 with the Oslo Convention against dumping and was broadened to cover land-based sources of marine pollution and the offshore industry by the Paris Convention of 1974. These two conventions were unified, up-dated and extended by the 1992 OSPAR Convention. The new annex on biodiversity and ecosystems was adopted in 1998 to cover non-polluting human activities that can adversely affect the sea.<sup>5</sup>

The fifteen Governments are Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

In 2012 Keep Northern Ireland Beautiful started recording marine litter on survey beaches across Northern Ireland. The survey method was designed by OSPAR to help set a standard for monitoring litter on beaches across countries bordering the North Atlantic.

Currently 11 beaches are being surveyed in Northern Ireland for all types of litter (see page 11).



OSPAR has a stated aim to substantially reduce marine litter, in the OSPAR Maritime Area, to levels where the properties and quantities of marine litter do not cause harm to the coastal and marine environment.

One of the key indicators of the abundance, composition and trends of litter in the marine environment is the amount on beaches. OSPAR monitors litter on 100m stretches at over 70 beaches in the North-East Atlantic following common monitoring guidelines.

Assessment of beach litter monitoring data has shown that litter is abundant on beaches in the OSPAR Maritime Area. Plastic fragments, fishing-related litter and packaging are the most common

types of litter found, with plastics comprising over 90% of items in some areas. Changes in composition and trends in the abundance of certain types of beach litter highlight where reduction measures are needed and, when implemented, the extent of their success.

There have been some significant changes in the amount of litter recorded since monitoring began, but no general trends across all survey sites have emerged. The large numbers of litter items are considered harmful, due to the potential threat of entanglement, ingestion or injury, and indicate that litter pollution is also a problem for marine life in the OSPAR Maritime Area.

You can view the data for all OSPAR sites by visiting **odims.ospar.org** 

Scientists have studied the litter collected by national and environmental

organisations from around Europe, compared the data and found that often the same items are among the most common beach litter items everywhere in Europe. The top ten types of litter represent approximately 63 percent of the total rubbish found on European beaches. Single use plastics, i.e. items that have been designed to be used only once and thrown away, make up six of our top ten litter types on Northern Ireland's beaches. This means that by targeting their use, the overall amount of beach litter could be reduced drastically. The top ten types of litter found on Northern Ireland's beaches are detailed on page 10 of this report. The long term aim is that updated assessments of all the OSPAR marine litter indicators will be included in the next OSPAR Quality Status Report in 2023.



## Methodology

The OSPAR Commission designed the marine litter survey guidelines to assist countries with recording and tackling the marine litter issue on both a local and global scale.

The information collected from each beach is fed into a central database which shows trends in the types of litter found in the marine environment. Surveyors record all marine litter found on the beach under different categories to help describe the different groups and items of litter observed.

When selecting beaches to be surveyed the following criteria was used. The beach must:

- Be composed of sand or gravel and exposed to the open sea;
- Be accessible to surveyors all year round:
- Be accessible for ease of marine litter removal;
- Be a minimum length of 100 metres and if possible over 1 kilometre in length;
- Be free of 'buildings' all year round; ideally not be subject to any other litter collection activities

Two sampling units are used to measure a fixed section of the beach between the



water's edge and the back of the beach. These units are:

- 100 metres: for identifying all marine litter items;
- 1 kilometre: for identifying objects generally larger than 50 centimetre.

The survey periods are as follows:

- Winter: Mid-December mid-January
- Spring: April
- Summer: Mid-June mid-July
- Autumn: Mid-September mid-October

To ensure that the marine litter being recorded during each of the surveys isn't duplicated the survey beaches are cleaned within two weeks of the survey.

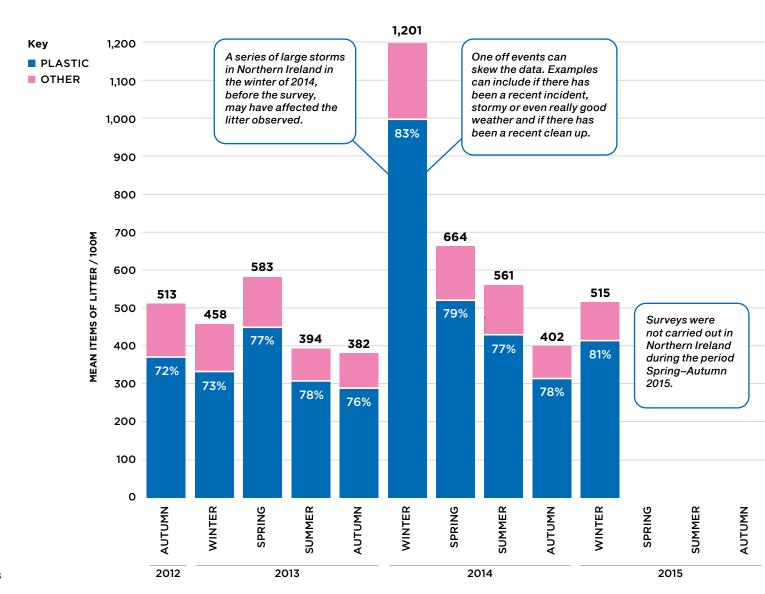
Once all data has been collected it is collated together into one form and uploaded to the OSPAR database. This data is also uploaded to the Keep Northern Ireland Beautiful website and can be viewed at:

www.keepnorthernireland beautiful. org/marinelitter



# The plastic problem

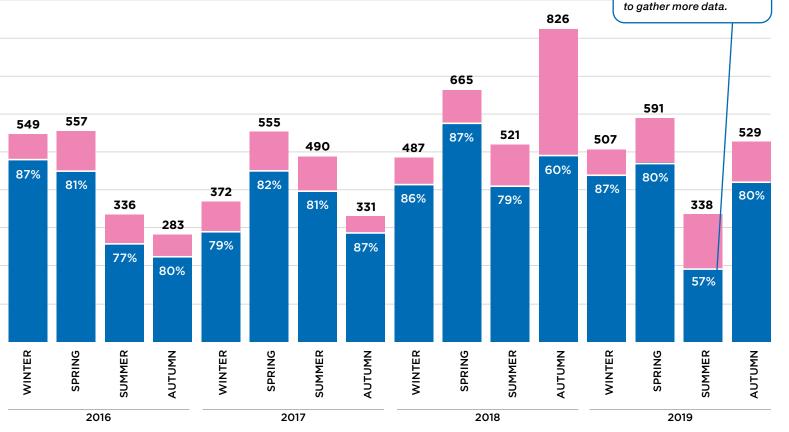
In 2019, 78% of the visible litter found on the beaches in Northern Ireland was made of plastic. As the volume of plastic being produced grows every year, we need to become more responsible with how we dispose of it and more aware of the impact it has on our environment.





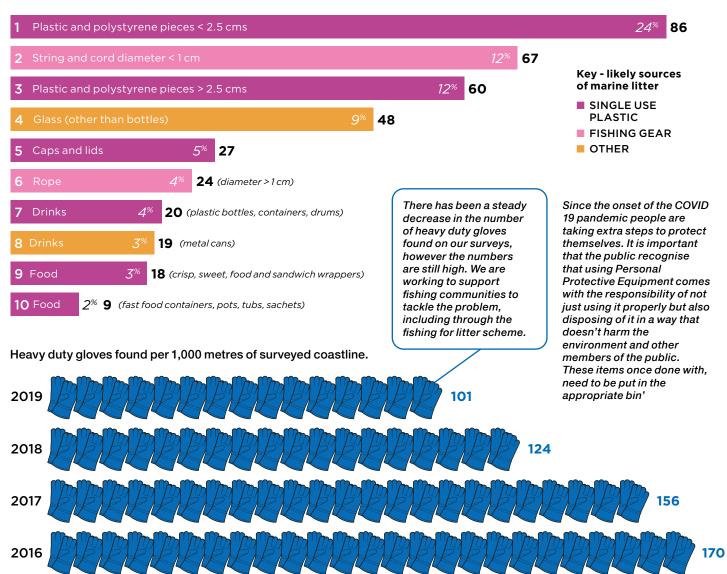
Ardglass beach in County Down, an example of a beach in close proximity to a fishing harbour (left), showing an array of plastic litter and an abundance of blue heavy duty gloves (see graphic on page 10).

This large decrease in litter and plastic may be due to an increase in beach cleans occurring. This is an anecdotal observation at the moment but we hope to get a better understanding of the trends as we continue

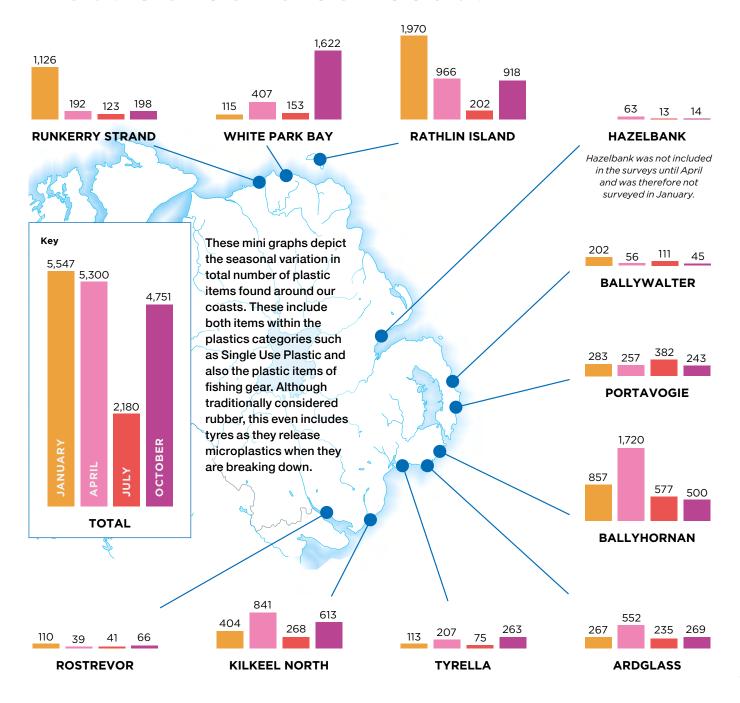


## 2019 Terrible Ten

Plastic continues to dominate the most common items found on the survey beaches both as Single Use Plastic such as food and drinks containers and in the form of string, rope and cord. The graph below details the average number of pieces of each type of litter found within the 100m survey.



## Plastic around our coast



## Marine litter in Northern Ireland

Over the past six years the results for the marine litter surveys have fluctuated from year to year with an average of 5,080 items recorded per kilometre in 2019. This equates to 5 pieces of litter per step.

Litter is still being found in large quantities across the survey beaches in Northern Ireland showing that there is still a need for local government, NGOs and the public to work together to tackle the problem. Although this year's overall litter count is down we must continue to work together to maintain this trend.

On page 10 it can be seen that six of the top ten items found on average were single use plastics and two of the categories are considered to be commonly used as fishing gear.

This demonstrates a need to change the attitudes of the population on single use plastics, especially when it comes to drink and food containers. These items are not just a problem when they are whole but as they break down into smaller plastic pieces they become more difficult to manage, harder to remove from the environment and increasingly likely to be ingested by wildlife.

Although there is still a need to encourage further behavioural change there have been many positive results from the

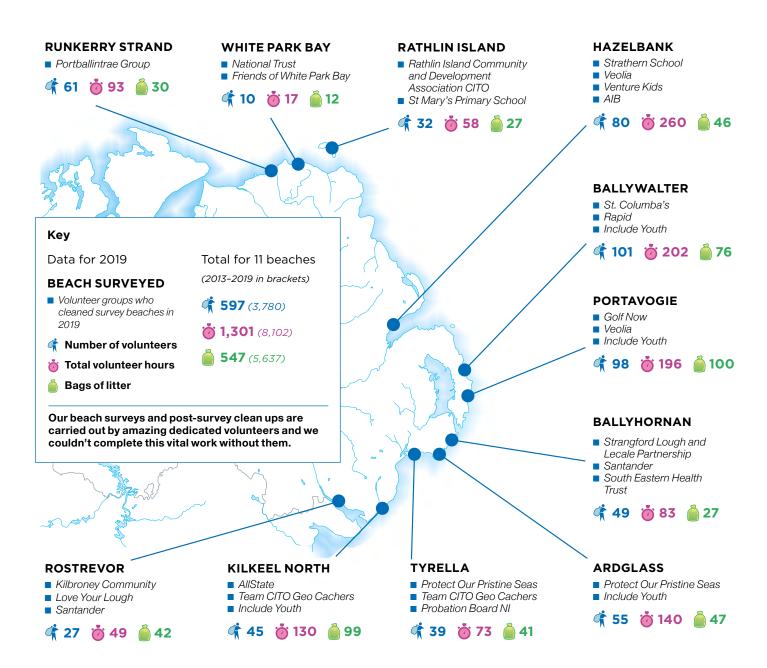


promotion of the marine litter work that is being done throughout Northern Ireland.

For example the clean-ups which occur after the surveys have seen; 547 volunteers get involved, removing 570 bags of litter from the survey beaches. Across the whole of Northern Ireland, the Live Here Love Here programme has promoted even further clean ups, resulting in an additional 130,128 volunteers removing 44,820 bags of litter from beaches, streets and parks in 2019. Everyone can have the opportunity to both organise and/or get involved in a clean-up. You can find out more about opportunities to get involved throughout Northern Ireland by checking out our interactive map and our app. These can be found at: liveherelovehere.etinu.net

Year on year there has been a decrease in the average number of heavy duty gloves found on the survey beaches. These are generally associated with the fishing industry. This problem is being addressed by clean-ups of the beaches in proximity to fishing harbours with support from the local community. The decrease may also be due to the introduction of the Fishing for Litter scheme, were fisherman can take action by gathering marine litter that is caught in their nets and disposing of it at participating harbours. To find out more information on this visit the Northern Ireland fishing for litter page on www.facebook.com/ **FishingforLitter** 

## Volunteers and results



# **Microplastics**

# Human activities continue to impact the marine environment.

The visible impacts of plastic pollution have been well documented in recent years. However we are increasingly aware of the additional impacts caused by the pieces of plastics which are too small for us to see.

Plastic is an amazing lightweight and resilient material which can be shaped and moulded for an almost endless variety of purposes. It has become a significant part of modern life and is used in a hugely diverse range of products or

applications, from the clothes we wear to the packaging of the food we eat. Despite these many advantages, it is becoming increasingly clear that our excessive consumption of plastic is having a severe negative impact on our natural environment and our own wellbeing.6 Ironically, it is the durability of plastic that makes it pose such as risk to the environment, Plastic, even if labelled as biodegradable or compostable, never truly disappears. Rather it breaks down into smaller and smaller pieces know as microplastics. Microplastics are everywhere from the air that we breathe, water we drink and food that we eat. 7,8,9,10 In 2019 WWF (World Wide Fund for

Nature) released a report that suggested that on average, people could be ingesting as much as 5 grams of microplastics every week, this is the equivalent of a credit card.<sup>11</sup>

Microplastics are defined as pieces of plastic which are less than 5mm in diameter. They can derive from primary sources, manufactured to be small in size such as pre-production pellets (nurdles) and microbeads, or secondary resources where they have broken down from larger plastic items such as bottles, packaging or even tyres. The first studies on marine microplastics were reported in scientific literature in the early 1970s by Carpenter and Smith, and others. 12,13 The impacts of

### Where do microplastics come from?



68,000

tonnes of microplastics from tyre abrasions are generated in the UK every year

between 7,000 and 19,000 tonnes enter surface waters



microplastics on biodiversity and the functioning of marine ecosystems are only just starting to be explored.<sup>14</sup>

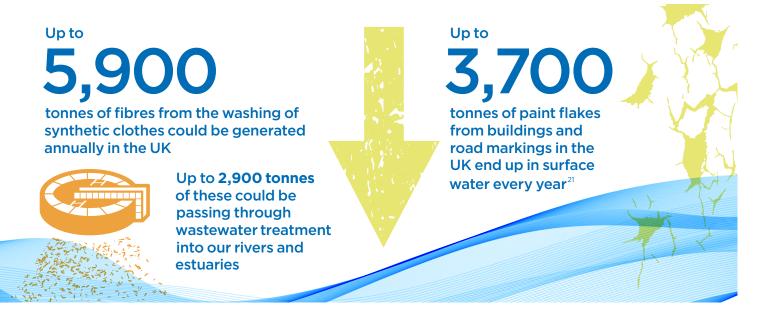
One challenge we currently face is a lack of understanding of the impact microplastics have on the environment and human health. A recent example of this lack of understanding can be seen in the use of plastic microbeads. Microbeads started to be used in personal care products in the late 1960s, it wasn't however until more recently that the impact of these microbeads was realised and information communicated to consumers. Rinse-off cosmetic products containing microbeads were used by people almost daily until recently.

Microbeads were banned in cosmetics products in England in 2017, Scotland and Wales in 2018 and in Northern Ireland in 2019. 15,16,17,18

Microplastics in the ocean can come from numerous sources including; vehicle tyres (a major direct source of microplastics to the environment<sup>19</sup>), broken down packaging, brake pads and road markings as well as from synthetic clothes and textiles. These are items we rely heavily upon, on a daily basis.

Another potential source of microplastics is via sewage and wastewater treatment plants. Treatment plants remove contaminants from waste water by

settling out the contaminants in the form of a sludge. This is normally done in a two-part process and in both of these stages microplastics have been detected. Although treatment plants are designed to remove waste, microplastics are too small to easily remove and often make it through the filtration system, which can result in them being washed out to sea. Microplastics that are caught at the first stage and removed in the sludge are often spread on soils as fertilizer increasing the risk of plastic contaminating our food. These plastics could potentially be washed away by rainfall and irrigation after application and re-enter into waterways.20



## **Nurdles!**

#### What are nurdles?

Nurdles are small plastic pellets which, when melted together are used to make nearly all our plastic products. They are tiny disc or lentil shaped pellets measuring 5mm or less.<sup>22</sup> As they are used to create many plastic products they are often transported around the world. During transport nurdles can be lost at sea or at port when being handled. They can also come directly from factories where they can wash down drains and ultimately out to sea. Due to them being so light they are easily dispersed by currents and wind and have been observed washing up on beaches across the world.23

#### Why are nurdles harmful?

Similar to other plastics, nurdles attract other contaminants, known as Persistent Organic Pollutants (POPs) and bacteria and viruses such as E.coli to their surface. POPs are chemicals that can accumulate in wildlife and human tissue causing long term damage. Plastics, including nurdles, are like sponges for these toxins leading to high concentrations being collected on nurdles. Although some of these chemicals have now been banned they still persist in the marine environment and accumulate around these plastics. Population 25

#### What's the solution?

Due to nurdles being so small in size they are almost impossible to clean up once they have entered the marine environment. Therefore to tackle this problem nurdles must be managed better at the source. Work must be done to help reduce the loss of pellets while in transport or during their use in factories. Examples may be to improve transporting techniques, putting filters in drains or training staff and providing effective spill kits to keep nurdles contained.

#### Nurdles are hard to spot! They are very small and their colour often blends in with the sand.

Another way to help tackle the nurdle issue is to take part in FIDRA's Great Nurdle Hunt and record any nurdles that have washed up on your beach. When you find any nurdles you should share this on the Great Nurdle Hunt website to help show the local plastics industry their impact on our seas.

To learn more information on the Great Nurdle Hunt and how you can get involved visit their website at www.nurdlehunt.org.uk.



The nurdles above were collected on the Groomsport beach in Bangor. All nurdles are between 3 and 5 mm in diameter and often shaped like a lentil. They are clear or white in colour but become yellow over time. Some of them are coloured.

# Impacts of microplastics

Although there has undoubtedly been an increase in the awareness of marine litter, it still poses a huge threat to marine ecosystems.

The number of marine species recorded that are known to be affected by marine debris increased by 40% in the world between reviews published in 1997 and 2012. Entanglement is commonly observed in larger species, such as seals that haul themselves out on land making it easier to observe. Entanglement is dangerous for these species and may lead to mortality due to starvation, strangulation, wounds

and infection, dehydration, drowning

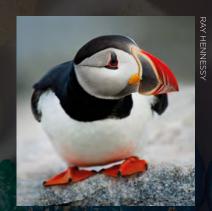
and increased vulnerability to

predation.27

Ingestion of marine debris impacts almost all marine wildlife of any size. In recent studies microplastics were found in animals from primary consumers such as zooplankton to top predators including fish and seabirds, either through eating plastic directly (ingestion) and/or eating other animals with plastic inside them and in their tissues (biomagnification).28 In smaller animals the toxic effects of microplastics can cause abnormal swimming behaviour, stunted growth, stress, immune disruption and death.29 Larger species such as marine mammals and birds have also been

known to ingest larger pieces of marine litter which can lead to death by suffocation or starvation. One study published in 2015 suggested that 90% of the global population of seabirds have ingested some form of plastic.<sup>29</sup>

Marine litter impacts the environment and also the economy, human health and wellbeing. In 2011 it was estimated that on a global scale the value of marine ecosystem services provided benefits to society of approximately £38.2 trillion per year.30 In the same year it was estimated that the impact of marine litter would reduce this from 1-5% which is a reduction of £384 billion-£1,922 billion in the benefits derived from marine ecosystem services.31 In Northern Ireland the estimated annual loss to beach amenity value from marine debris is £36 million.32 It is not just marine ecosystem services that are affected by the large influx of litter, fishing vessels in the UK are also impacted. In a survey of Scottish vessels, undertaken to gain an understanding of the impact marine litter was having on the fishing industry, 86% of vessels surveyed had experienced a restricted catch due to marine litter, 82% had their catch contaminated and 95% had snagged their nets on debris on the seabed. These incidents lead to an average cost of £19,000 for each fishing vessel.33







# Tackling marine litter through environmental leadership

### Mid and East Antrim Litter Heroes Award Winner 2019: Cameron Liddle

15 year old Cameron (below, centre) is a dedicated litter picker. Over the past year he has lifted around 100 bags of litter from the Larne and Carrickfergus areas. He takes these all to the local recycling Centre in Larne as he sorts out the plastic and electrical appliances for recycling. Cameron is out lifting litter at every opportunity and at least on a weekly basis in and around the Carrickfergus and Larne areas. His dad keeps a litter picker and black bags in his boot so that they are always ready to go. He even took his litter picker to Donegal so he could continue the effort while on holiday! Cameron volunteers at IPC Kilroot and Raloo Youth Club emptying the bins and recycling the contents.





#### **EU SWIM**

The EU SWIM Project is a cross-border research programme, aiming to develop a prediction system for live bathing water quality monitoring. The project combines the expertise of University College Dublin, the Agri-Food & Biosciences Institute and Keep Northern Ireland Beautiful. The specially designed, pilot system will enable short-term pollution events to be predicted at the 9 cross-border beach locations. The predictions will be communicated to the general public via various options, including the following: a free app for smart phones (above); Facebook and Twitter pages; electronic beach signage and a dedicated website. The ease of access to live water quality predictions will work towards protecting the public from episodes of illness caused by entering poor quality water. The project has been funded by the EU's INTERREG VA programme, managed by the Special EU Programmes Body with a total funding value of nearly €1.4 million.

To find out more please visit swimproject.eu

# Seaview Primary School working hard to protect our marine environment

The black guillemot is a very special seabird and Seaview Primary School pupils (right) have been making nest boxes for Glenarm's resident black guillemots with the help of Mid and East Antrim Council and RSPB.

Seaview Primary School made new homes for these birds before going off for their 2019 Christmas break. Their involvement has been precious because the birds in the next breeding season will, hopefully occupy the bird boxes built by the pupils.

Ashleigh Moran, teacher at Seaview Primary School, said "In Glenarm we are so lucky to have many unique species of animals. At Seaview, we feel it is important that our children have a knowledge of the species that live on our doorstep. After finishing the nest box, the children were shown around the Marina by Billy the Harbour Master and were very lucky to see a couple of black guillemots sitting in the water. They are fascinating birds and we hope they will enjoy their new nest boxes and live in Glenarm for more years to come."

Pupils at Seaview are also busy all year around running beach clean events at Glenarm to keep their beloved strand beautiful.



## Mill Strand Integrated PS and their love for the environment

Mill Strand often takes global learning outdoors, using the West Strand beach as an outdoor classroom. Here, pupils can enjoy some fresh air and experience the local environment as they learn about it. These outdoor lessons are usually followed up by further discussion and teaching in the classroom.

In an excellent example of hands on global learning, the school has been doing a lot of work on plastic waste since 2017/18 academic year. This work is still ongoing and pupils have regularly taken part in litter picks along the beach. The school has also assumed responsibility for looking after another, lower section of the beach through joining the Adopt a Spot scheme run by Keep Northern Ireland Beautiful. Plastic often turns up amongst the litter, providing a perfect opportunity to get everyone thinking about the global impact of plastic waste, including its effects on marine life. In class, pupils have been researching the causes of the plastic waste, while also

thinking about how to tackle this significant global problem.

The school likes to challenge its pupils to actively consider and create solutions, rather than simply investigating problems, therefore on this line, they have been involved in the 2019/2020 'Beach Bucket Challenge' run by Causeway Coast and Glens Borough Council. They will soon start a collaboration with Skerrie Scuba Sub Aqua Club in Portrush to keep carrying out the '2 minutes beach clean' at more "deep" level this time!





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