



A Report by

PLANET  
PATROL

2022

# EXTENT OF SINGLE-USE LITTER IN THE UK











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# INTRODUCTION

Since 2016, Planet Patrol's app-based litter logging has engaged citizen scientists in 113 countries across the world. Together they have logged and collected over 400,000 individual items from every continent, except Antarctica. Without their efforts, this litter would continue to exist, unobserved and unaccounted for, but invisibly causing harm to our environment and ecosystems.

As participants log data on our app, they record the product types and brands of each item they find. In recognition of the sheer amount of non-plastic litter collected, Planet Patrol rebranded from Plastic Patrol in 2020. A new name has not changed the core values of our mission. Planet Patrol is determined to inspire collective action; to educate through people-powered research and to hold polluters to account.

## **The 2021 report**

This report investigates the findings of our citizen scientists to reveal the key litter trends of 2021. Our dataset was first broken down by location. This set the direction of this report. With over 85% of data collected in the UK, findings could not be taken as representative of the other 35 participating countries. Boasting such a majority of data, we decided to focus analysis almost exclusively upon the UK.

The UK data was then analysed by material, product type and product brand. The branded products are then analysed further to uncover the parent companies most responsible. With large datasets from 2019 and 2020, we were able to observe trends in the UK litter landscape over the past three years. Based on these findings, Planet Patrol offers a set of five recommendations to policy makers to improve the litter landscape of the UK.

## **Covid-19 and climate action**

A study across 24 countries revealed 85% of adults are willing to take personal action to combat environmental and sustainability challenges in 2021<sup>1</sup>. Over half of these participants felt it more important to reduce their own carbon footprints following the pandemic.

This sentiment has certainly been reflected in our work. Record numbers of people have chosen to take part in Planet Patrol clean-ups, both independently and at our events during 2021. This renewed enthusiasm has enabled us to collectively retrieve 85,326 pieces of litter in the 12 months reported. With so many engaged 'Planet Patrollers', we can't fail to have hope for 2022.







# FOREWORD

Plastic is a major contributor to climate collapse but for too long the inextricable link between the plastic crisis and climate breakdown has been overlooked. Its production is already responsible for 5 per cent of global greenhouse gas emissions and by 2050, when plastic production is predicted to have tripled, it will account for almost 13 per cent of our planet's total carbon budget.

It's well documented that when plastic breaks down it fragments into smaller and smaller pieces, releasing microplastics into the environment. These insidious microscopic particles are often invisible to the naked eye but have been found in everything from salt, soil and beer and are having a major impact across our natural world. Marine life is suffering fertility issues and endocrine disruption and now microplastic particles have been discovered in our bloodstream. We are a generation of human guinea pigs in an uncontrolled global experiment watching the effects of plastic pollution on our human health unravel in real time.

Over the seven years I've spent paddle boarding around the UK and globally, I have witnessed first hand the devastating impact single use materials are having on nature, destroying our aquatic environments and ecosystems.

Planet Patrol's third annual report shows for the first time that the proportion of litter made from plastic has reduced, indicating a positive shift in consumer behaviour around avoiding plastic purchases. Addressing plastic pollution should remain a major global priority, but as the race to reduce its usage has intensified it's resulted in significant unintended consequences that also require attention.

The continuing rise of single use in materials such as glass metals and cardboard clearly demonstrates the huge amount of work to be done in transitioning the UK to a truly circular economy.

The insights we are able to take and nuances we can draw from Planet Patrol's data in aiding our understanding of the prevalence of types, brands and hotspots of litter, would not be possible without our volunteers. People powered data collection is a credible and robust way to gather information on environmental issues that would otherwise be impossible to track and capture at scale. Mass participation in citizen science is a powerful evidence base to inform and shape policy but also to empower individuals to take action in their communities -

and this should not be underestimated.

Over the last six years, Planet Patrol's community has logged over 400,000 pieces of litter across 113 countries globally. The passion and enthusiasm of Planet Patrol's volunteers demonstrates how strongly the public feels about tackling the plastic crisis and their willingness to act on it. But we cannot allow the responsibility of cleaning up litter to fall on the general public.

There were just ten parent companies responsible for more than 50% of branded litter recorded in the Planet Patrol app during 2021. We are part of a fundamentally flawed system that continues to allow brands to pollute without consequence or accountability, whilst our environment pays the price. Litter is the symptom of a deeper rooted, system problem - not the cause.

It's time to reimagine and recreate our waste management infrastructure and the lifecycle of products so that litter simply doesn't exist. If a product doesn't have a purpose at the end of its life, if it can't be reused or recycled then it shouldn't be put into production in the first place.

I believe that the transition to a fully circular future is both essential and possible. If the UK government is sincere in its ambition to be a world leader in tackling pollution, then closed loop solutions like the Deposit Return Scheme and Extended Producer Responsibility reform must be implemented as a priority.

Planet Patrol's people-powered data shows that single-use plastic is declining and we need to see this success built upon across all materials. By following our evidence-based recommendations, the UK can take the steps needed to solve the litter pollution crisis.



**Lizzie Carr MBE**

Planet Patrol founder







# EXECUTIVE SUMMARY

Planet Patrol is redefining what can be achieved through collective action and citizen science by placing power in the hands of the people to tackle environmental issues. Housing the UK's most comprehensive and robust people powered database, over the last six years our volunteers have logged more than 400,0000 pieces of litter data that would otherwise be impossible to capture.

Each year, Planet Patrol launches a diverse programme of free activity based clean up events across the UK (featuring paddle boarding, kayaking, yoga, parkour and HIIT fitness) for public participation. This is used as a vehicle to engage communities bringing environmental issues to life, creating the opportunity to see the problems first hand and the tools to take meaningful, positive action.

In 2021, the Planet Patrol app was downloaded 5,400 times and more than 200 clean up events were organised and delivered. At these events or independently, volunteers covered an estimated 27,000km of land, coastlines and waterways adding vital data by tracking, logging and removing litter. A total of 85,326 pieces have been recorded and geolocated in the app - broken down by brand, material and type, with each individual piece verified and photographed.

## Key findings

This dataset creates one of the most detailed pictures of the litter crisis in the UK, across land, waterways and coastline. These are the key findings:

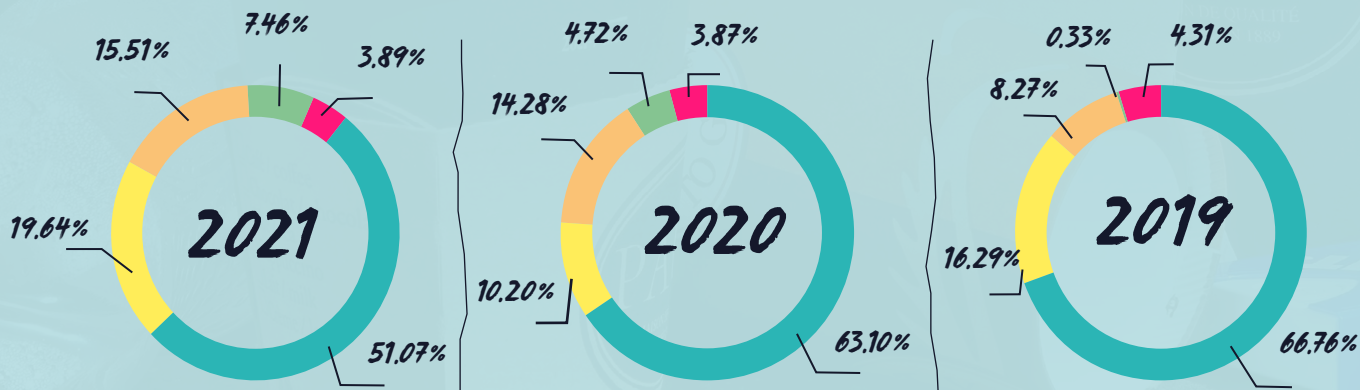
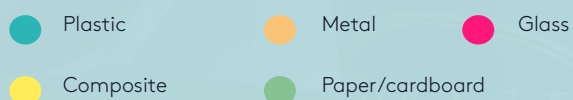
## MATERIAL TYPES

For the last three years, plastic has been the most common material type logged on the app, but as a proportion of the total, we are beginning to see a decline in the amount of plastic waste being reported. In 2019, plastic made up two thirds of all litter; in 2021 it was just over half.

While the decline in the proportion of plastic waste logged on the app is encouraging and shows that awareness of the issues surrounding single-use plastics is making an impact, at the same time, there has been an increase in other materials being logged on the app.

The increase in metal, paper and cardboard waste shows the need for an approach to tackling single use litter that does not solely focus on plastics. This is why we are calling for an end to the delays around introducing an all-in deposit return scheme (DRS) for the entire UK.

## TOP FIVE MATERIALS LOGGED BY PLANET PATROL VOLUNTEERS





## PRODUCT TYPES

Planet Patrol's data shows nearly three quarters of litter in the UK is made up of just ten product types. By targeting a small number of industries, it would be possible to make large scale reductions in the amount of litter.

With the exception of fragmented plastics, which are often broken down and unidentifiable by brand, metal drinks cans were the most common, followed by plastic packaging and plastic bottles.

Our data reveals the drinks industry to be responsible for creating more than a third of all litter in the UK, consistent with our findings from the previous year.

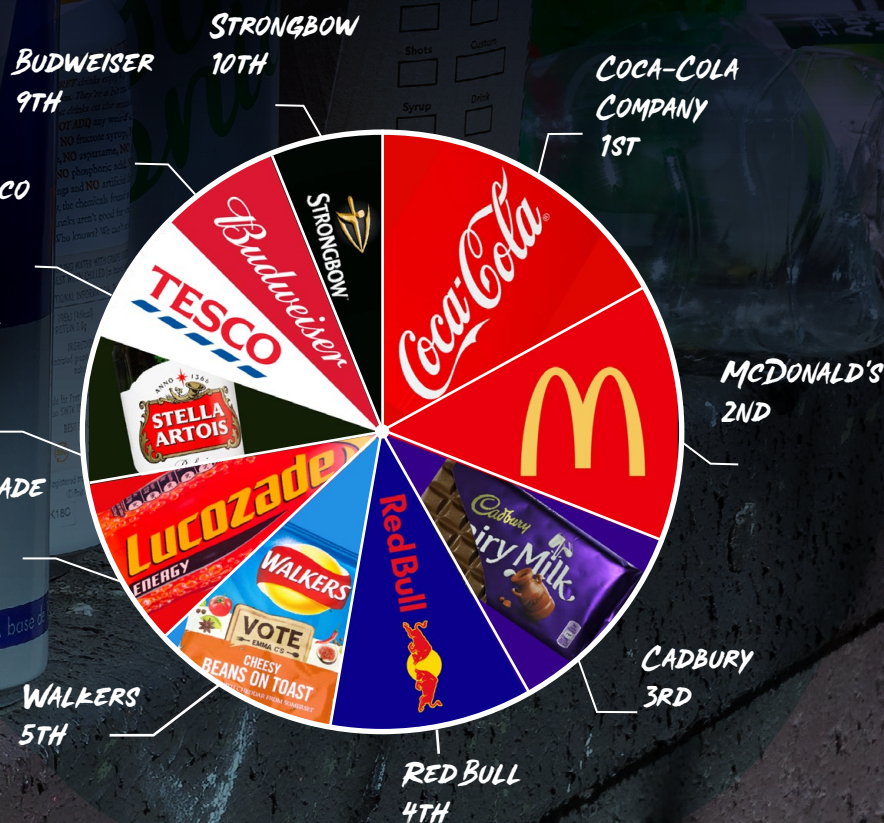
Metal drinks cans, plastic bottles, glass bottles, plastic bottles, lids and other drinks products made up 33.6% of all litter logged during 2021.

Product Types	
Rank	Type
1	Plastic fragment
2	Metal drinks can
3	Plastic packaging
4	Plastic bottle
5	Cigarette butt

Table showing the five most commonly logged litter types of 2021

## BRANDS

The drinks industry is also heavily over-represented among items of litter that can be identified by brand. 1,755 brands were recorded in the Planet Patrol app in 2021. Of these brands, the top most recorded brands are outlined in the pie chart:



Top ten brands responsible for the most litter logged in 2021



# RECOMMENDATIONS

One of the most effective ways to reduce unnecessary single use litter in the UK is to eliminate it. Ultimately we need a complete reimagination and overhaul of the waste management infrastructure, and bold legislation from the government to ensure the polluting brands are responsible for the entire lifecycle of packaging - including disposal. No more delays, we need action.

## **RECOMMENDATION 1:**

**Introduce the Deposit Return Scheme and include the full range of materials proposed without any further delay.**

In their 2019 manifesto, the government promised to introduce a Deposit Return Scheme. The government has since released the details of its consultation, as well as a list of recommendations, however the scheme will not be rolled out until 2024. The data shows drink producers are the main culprits of UK litter illustrating the need for an urgent introduction to the DRS. In March 2022, the UK Government announced that glass bottles would not be included in a DRS. It is estimated that up to £14.8 million is lost through littering recyclable materials. We could be gaining millions annually if the DRS is introduced earlier.



## **RECOMMENDATION 2:**

**Include cigarette producers in the Extended Producer Responsibility (EPR) Scheme and enforce transparency on waste reduction plans.**

Cigarette butts are still the UK's 5th most commonly littered item according to Planet Patrol's data therefore the government should include cigarette producers in EPR holding them responsible for the entire lifecycle of their products. At the same time, the government should require cigarette companies to be transparent about their environmental protection strategies including disclosing their action plans for waste reduction.

### **RECOMMENDATION 3:**

**Include monitoring of plastic fragments and microplastics as part of government targets to improve water quality.**

Plastic fragments were the most common type of litter logged on the Planet Patrol app in 2021. Plastics degrade into smaller fragments and eventually microplastics that can be swallowed by fish and other marine life and then enter our food chain. These microplastics have now been found in our lungs and in our blood. Any water quality targets must include monitoring of plastic fragments and microplastics to ensure progress is being made.

### **RECOMMENDATION 4:**

**Publish data from the 2022 Plastic Packaging Tax (PPT), including type, brand, and location of items, to monitor its success and prevent unintended consequences.**

This will create further accountability for producers included in the Extended Producer Responsibility scheme (EPR) and the Deposit Return Scheme (DRS) for the lifecycle of their products.



### **RECOMMENDATION 5:**

**Overhaul recycling infrastructure to create a standardised and consistent system nationwide, capable of managing different types of waste and increased capacity.**

Much of the UK's waste infrastructure has not seen substantial improvements in three decades, while the makeup and volume of litter has changed. This year's Planet Patrol dataset shows plastic accounts for a smaller proportion of litter (51%) but there's been a marked increase in metal, paper and cardboard. Metal litter has nearly doubled from 8% in 2019 to 15.5% in 2021, while there has been a 21-fold increase in paper and cardboard waste from 0.33% in 2019 to 7% in 2021. The current recycling system is inadequate and roughly two-thirds of domestic plastic waste is sent overseas to be recycled, which should be managed in the UK.



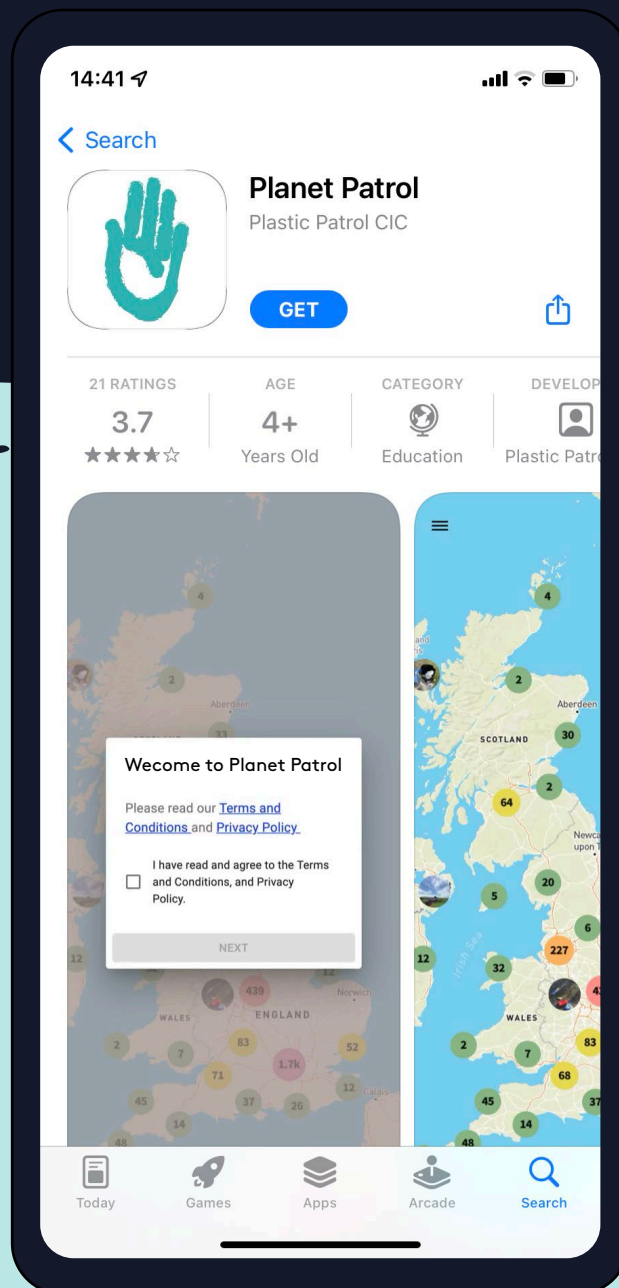
# METHODOLOGY

## 2.1 DATA COLLECTION

In 2021 the Planet Patrol app was downloaded more than 5,400 times and data was collected from 1,291 unique devices across 35 countries. Participants can work independently, organise their own clean-ups or join Planet Patrol's events. Throughout 2021, Planet Patrol ran over 200 targeted clean up events.

### 2.1.1 HOW IS DATA COLLECTED?

Data collection is completed using Planet Patrol's mobile app. Anyone with a smartphone can contribute to Planet Patrol's dataset at their own convenience. Users upload a time-referenced and geotagged photograph of every piece of litter they collect. For each photograph submitted, the user must input the type of litter, the material from which it is made and any branding information into the app. Using this method, Planet Patrol's citizen scientists logged 85,326 individual pieces of litter in 2021.



### 2.1.2 APP UPDATES

Since April 2019, the Planet Patrol app has included pre-set categories to help users to input their data (See appendices). Users still have the option to add their own category if their litter does not correspond to the standard categorisation, but these are only approved if they pass the Planet Patrol validation process.

In July 2020, categories were added in response to a rise in pandemic-related litter such as facemasks and disposable gloves. The same year, a new barcode scanning feature was introduced so that the type and brand of litter can be added automatically and significantly speed up the input time.

### 2.1.3 WHERE WAS THE DATA COLLECTED?

A total 86% of the litter reported on the app in 2021 was found in the UK. This is because a high proportion of Planet Patrol's citizen scientists are based in the UK, and also hosts the majority of organised clean up events. London was the area with most engagement, followed by South East England and South West England respectively. For more discussion, see section 3.4.

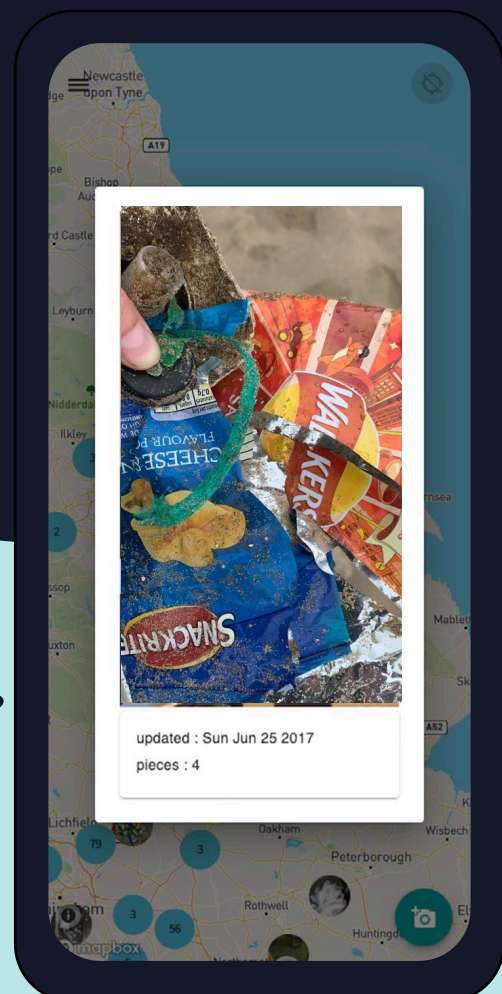


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FOUND IN THE UK.**

### 2.2 DATA VALIDATION

Planet Patrol employees validate every image uploaded to the app. Employees identify typographical errors and mis-categorisation to ensure that the user-added information matches the photo they have uploaded. Employees also identify the product material, parent company of each brand and the recyclability of types of litter for the purpose of our analysis.

As with all data sourced by volunteers, there is the potential for bias. Planet Patrol recognises that preconceptions of certain items of litter do exist which can impact this dataset. Due to the large size of this 2021 dataset, the potential consequences of these biases are reduced. The simplicity of the data collection procedure also limits the risk of bias in this study.





# KEY FINDINGS AND DISCUSSION

The data and discussion presented here will focus on the extent of single-use litter pollution in the UK. As this is where the majority of the litter was collected, we cannot make assumptions that these patterns extend to the other 35 participating countries. However, we do draw comparisons between UK findings and those from other participating countries in section 3.6.2 to provide a wider context to our discussion.

We consider our findings by environmental location, by season and by UK region. We spotlight the three places where the most litter was logged this year to celebrate their efforts and compare their results. These sections provide context to the discussion of litter materials, litter types and litter brands to follow. Yet, underpinning all these results, is a consideration of the economic impact of litter pollution on the UK.

## LITTER



### 3.1 ECONOMIC IMPACT

The UK uses nearly 2.5 million tonnes of single-use plastic packaging every year.<sup>2</sup> This accounts for almost 50% of the country's total annual plastic consumption. Consuming plastic at this rate has a profound economic impact, both in the immediate and in the long-term.



Every single-use product that is littered is a missed revenue opportunity. Take a metal drink can – the second most commonly logged litter item in 2021 – for example. If a can is littered, rather than recycled, it means that a new can must be produced in its place. This requires 95% more energy than recycling the existing can.<sup>3</sup>

From Planet Patrol's findings, 36% of litter in our 2021 dataset is theoretically recyclable in the UK. If we remove 'fragments' (of all materials) from the analysis, the percentage of theoretically recyclable litter increases to 43.8%. One study in 2013 revealed that every year, the theoretically recyclable materials lost to littering are worth between £12.8 million and £14.8 million in the UK. This could all have been reintroduced to the economy if we had a standardised and consistent recycling system, improved infrastructure and better consumer behaviour patterns.

Litter also causes an increase in environmental harm from the carbon emissions released during the production of new items and the extraction of materials required to make them. Let's turn again to the metal drinks can. For every tonne of aluminium cans recycled, 9,245kg of CO<sub>2</sub>e (CO<sub>2</sub>e refers to CO<sub>2</sub> and other polluting gases such as methane and nitrous oxide) is prevented from entering the atmosphere. However, if the

same tonne of products is sent to landfill, 21kg of CO<sub>2</sub>e will be emitted.<sup>4</sup>

Cleaning up litter comes at a high cost to local authorities and in turn the tax payer: every year, £660 million is spent in the UK. The cost of cleaning up cigarette butts alone is approximately £40 million every year<sup>5</sup>. If this wasn't enough, 52% of local authorities have reported that their litter clean-up costs have increased since the beginning of the pandemic.

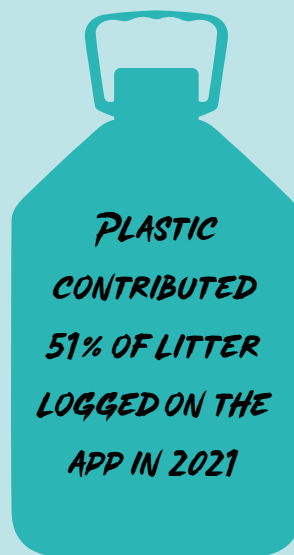
There is also a high cost associated with litter disposal. Overloaded landfill sites quickly become places of environmental pollution, emitting CO<sub>2</sub> and methane. In 2019, UK landfill sites emitted an estimated 14.2 million metric<sup>6</sup> tons of carbon dioxide. Without action, these clean-up costs will be felt far into the future.

### 3.2 ENVIRONMENTS

Planet Patrol's app users have logged litter across many different landscapes including coastlines, cities and waterways.

This range of environments differentiates Planet Patrol's findings from other studies conducted on litter. For instance, the EU Single-Use Plastic Directive (see section 3.6.3) has based their top pollutant list upon studies conducted exclusively in marine environments.

When conducting studies on beaches, plastic is generally found to be the dominant material type. However, Planet Patrol's findings across a variety of UK landscapes showed that plastic contributed 51% of the litter logged in 2021. The rest was formed either from composites (which can contain plastic) or from other material types. Plastic may not represent the dominant material type in every environment, but there is a lack of research documenting the scale and environmental impacts of non-plastic litter.<sup>7</sup>





### 3.3 SEASONS

In 2021, 67.81% of litter was logged in the warmer months of Spring and Summer (April, May, June, July, August and September) in the UK. Given that Planet Patrol's organised clean up events run between April and September, this larger percentage is to be expected. The seasonal findings from 2020 also reflected this trend with 68.64% of litter collected in Spring and Summer.

Figure 1 shows a breakdown of litter types logged in Spring/Summer and Autumn/Winter in 2021 in the UK. Here 'Spring/Summer' is April, May, June, July, August, September and Autumn/Winter is October, November, December, January, February and March.

**67.81%**  
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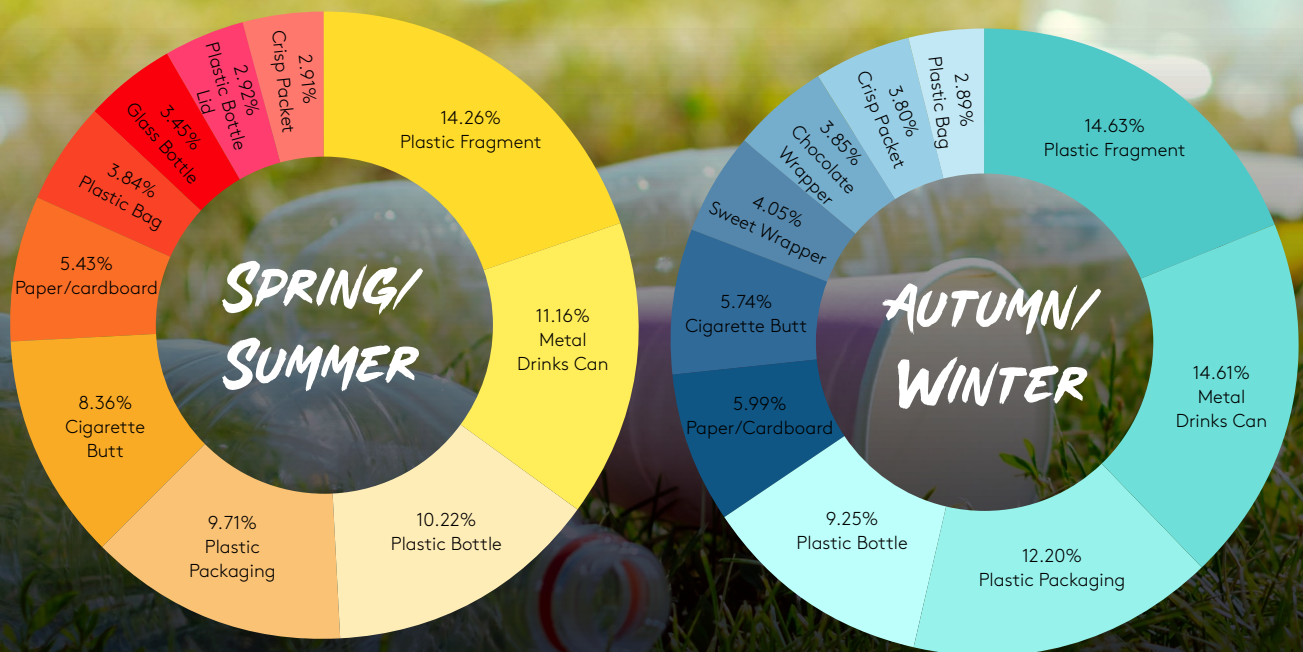


Figure 1 Comparison of litter logged between Spring/Summer and Autumn/Winter in the UK

Figure 1 reveals that the composition of litter logged is very similar between Spring/Summer and Autumn/Winter. One difference to note is the absence of glass bottles from the Autumn/Winter records. Comparatively, in Spring/Summer, these products accounted for 3.45% of litter. This could be linked to more picnics and outdoor drinking taking place in these warmer months.

2021		2020		2019	
Litter type	Percentage and number of pieces	Litter type	Percentage and number of pieces	Litter type	Percentage and number of pieces
Plastic fragment	14.26% (7093)	Plastic packaging	21.10% (6253)	Plastic packaging	21.65% (10611)
Metal drinks can	11.16% (5550)	Plastic fragment	10.41% (3085)	Plastic fragment	10.31% (5055)
Plastic bottle	10.22% (5086)	Drinks can	10.21% (3026)	Plastic bottle	8.76% (4293)
Plastic packaging	9.71% (4831)	Plastic bottle	9.10% (2696)	Cigarette butt	8.10% (3968)
Cigarette butt	8.36% (4159)	Styrofoam/ polystyrene	7.29% (2160)	Metal drinks can	7.03% (3446)
Paper / cardboard packaging	5.43% (2701)	Cigarette butt	7.20% (2133)	Polystyrene/ styrofoam	6.22% (3047)
Plastic bag	3.84% (1909)	Plastic bottle lid	3.92% (1163)	Plastic bag	5.96% (29210)
Glass bottle	3.45% (1718)	Plastic bag	3.68% (1091)	Plastic lid / bottle cap	5.22% (2560)
Plastic bottle lid	2.92% (1453)	Glass bottle	3.43% (1018)	Fishing net, rope and pieces	4.96% (2430)
Crisp packet	2.91% (1446)	Disposable cup	2.71% (803)	Glass bottle	4.22% (2067)

Table 2 Comparison of spring/summer litter from 2021, 2020 and 2019.

2021		2020		2019	
Litter type	Percentage and number of pieces	Litter type	Percentage and number of pieces	Litter type	Percentage and number of pieces
Plastic fragment	14.63% (3455)	Plastic packaging	14.63% (3130)	Cigarette butt	27.90% (745)
Metal drinks can	14.61% (3450)	Drinks can	14.61% (1822)	Plastic packaging	13.71% (366)
Plastic packaging	12.20% (2881)	Plastic bottle	12.20% (1586)	Fishing net, rope and pieces	13.41% (358)
Plastic bottle	9.25% (2184)	Plastic fragment	9.25% (988)	Clothing	7.12% (190)
Paper / cardboard packaging	5.99% (1414)	Fishing net, rope and equipment	5.99% (718)	Metal drinks can	6.37% (170)
Cigarette butt	5.74% (1355)	Plastic bottle lid	5.74% (515)	Plastic bottle	6.29% (168)
Sweet wrapper	4.05% (957)	Disposable cup	4.05% (497)	Polystyrene/ Styrofoam	4.38% (117)
Chocolate wrapper	3.85% (910)	Styrofoam/ polystyrene	3.85% (434)	Plastic fragment	4.16% (111)
Crisp packet	3.80% (897)	Glass bottle	3.80%	Glass bottle	2.32% (62)
Plastic bag	2.89% (682)	Cigarette butt	2.89%	Wet wipe	2.28% (61)

Table 3 Comparison of Autumn/Winter litter from 2021, 2020 and 2019.



## 3.4 LOCATIONS

### 3.4.1 UK Regions

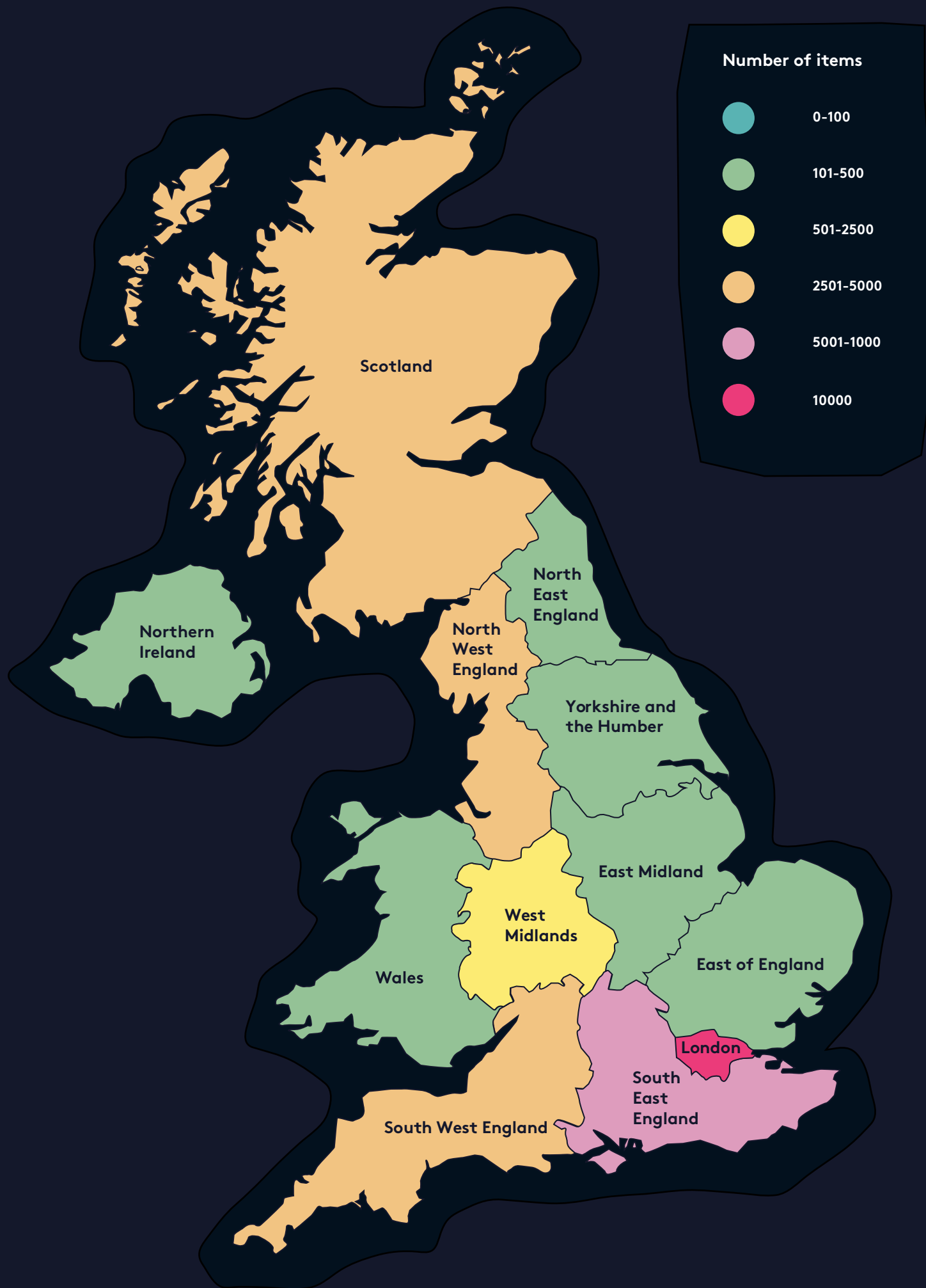
Planet Patrol's app users collect data from across the entire UK, however, every region is not equally engaged. Some areas are host to a greater number of Planet Patrol clean-up events while others are simply home to more active volunteers. As a result, the dataset is larger from some regions than others. Table 4 shows a breakdown of the number of pieces of litter logged in each UK region along with the percentage it comprises of total UK litter logged in 2021.

Region	Number of pieces	Percentage
London	17740	26.98%
Southeast England	11537	17.54%
Southwest England	8293	12.61%
Scotland	6601	10.04%
Northwest England	6575	10.00%
West Midlands	4931	7.50%
East of England	3037	4.62%
Wales	2635	4.01%
Yorkshire and the Humber	2624	3.99%
East Midlands	1033	1.57%
Northeast England	694	1.06%
Northern Ireland	60	0.09%

This breakdown shows where there is most engagement with the Planet Patrol app, not which areas have the most litter. Over a quarter of the litter was collected in London, showing that this is a highly engaged location. The Southeast and the Southwest follow with the second and third most records respectively. Scotland and the Northwest of England each show a fairly good level of engagement.

These differences in engagement have many possible explanations. Planet Patrol's 2020 Litter Report found that more affluent areas tended to log more litter on the app. While the 2021 dataset exhibits similar trends, when considering wealth on an individual level, the picture becomes more complex. While it is acknowledged that wealthier individuals may have more time and financial capacity to engage in environmental activism, affluent lifestyles are simultaneously more detrimental to the environment. In fact, the world's wealthiest are likely to have the largest carbon footprints and highest air miles<sup>8</sup>. Although wealthier regions display more engagement with the app, it cannot be assumed that the individuals lead more environmentally conscious lifestyles overall. Social, political and behavioural factors also have a part to play. Perhaps in locations with high app usage, discussions about environmental action are also more normalised. This could be through external advertising campaigns, from environmental campaign groups or political parties. For example, the Southeast and the Southwest are both home to higher numbers of Green Party voters who are likely predisposed to engage with clean up events. A map illustrating the number of items logged in each region of the UK. Map created using ArcGIS 10.8.1

Table 4 Litter logged in each UK region, ranked by number of pieces.





### 3.4.2 UK TOWNS AND CITIES

Litter has been collected and logged in 359 towns and cities across the UK. Table 5 shows the 20 towns and cities where the most pieces of litter were logged on the Planet Patrol app in 2021.

Town/city	Number of pieces	Percentage
London	15259	23.19%
Dundee	4171	6.34%
Fareham	3393	5.16%
Crediton	2983	4.54%
Reading	1864	2.83%
Sheffield	1765	2.68%
Glasgow	1433	2.18%
Southampton	1351	2.05%
Didcot	1152	1.75%
Wigan	1142	1.74%
Widnes	1124	1.71%
Birmingham	1113	1.69%
Feltham	1068	1.62%
Warwick	1050	1.60%
Ashton-under-Lyne	937	1.42%
Liverpool	848	1.29%
Hayling Island	790	1.20%
Cardiff	727	1.11%
Poole	672	1.02%
Nottingham	646	0.98%

*Table 5 The twenty towns and cities which logged the most litter in 2021.*

### 3.4.3 UK CONSTITUENCIES

While litter was logged in 426 constituencies in 2021, not all of them showed the same level of engagement. The table below shows the 20 constituencies most active on the Planet Patrol app.

Constituency	Number of pieces	Percentage
Dundee East	4147	6.31%
Enfield North	4019	6.11%
Richmond Park	3722	5.66%
Fareham	3582	5.45%
Central Devon	2983	4.54%
Battersea	1770	2.69%
Sheffield Central	1709	2.60%
Wokingham	1299	1.98%
Bethnal Green and Bow	1150	1.75%
Wantage	1149	1.75%
Wigan	1141	1.74%
Halton	1138	1.73%
Feltham and Heston	1136	1.73%
Warwick and Leamington	1085	1.65%
Poplar and Limehouse	1062	1.61%
Eastleigh	1012	1.54%
Ashton-under-Lyne	903	1.37%
Havant	899	1.37%
Cardiff South and Penarth	772	1.17%
Glasgow Northeast	724	1.10%

*Table 6 The twenty constituencies recording the most litter in 2021.*



### **3.4.4 SPOTLIGHT ON DUNDEE, ENFIELD AND RICHMOND**

The three locations which collected the most litter in 2021 were Enfield (4,089 pieces), Richmond (3,422 pieces) – both in London – and Dundee (4,171 pieces).

These three locations all represent a different landscape so provide good sites of comparison for litter materials, types and brands. Richmond is a riverine environment and hosted 36 paddleboarding clean up events throughout 2021. This area is home to 124 individual app users. The picture in Enfield and Dundee are very different. Enfield is an inland location where 99.76% of litter was collected by a single, independent app user. While Dundee is a coastal town, it is similar to Enfield in that all litter was logged by one dedicated app user.

**RICHMOND HOSTED  
36 PADDLEBOARDING  
CLEAN UP EVENTS  
THROUGHOUT 2021**



## PRODUCT MATERIALS

Figure 7 shows a breakdown of the number of each material type logged across the three locations, including any fragments to which the material can be determined.



7 Figure Comparison of product materials between Dundee, Enfield and Richmond.



## PRODUCT MATERIALS

Table 8 shows the different product types identified at each of the three locations. Given that in Dundee and Enfield, litter was collected by a single participant, these users may have

biases towards picking up certain types of litter. However, this behaviour is unknown.

Enfield		Richmond		Dundee	
Type	Percentage and number of pieces	Type	Percentage and number of pieces	Type	Percentage and number of pieces
Plastic bottle	771 (18.86%)	Plastic fragment	1022 (29.87%)	Plastic fragment	907 (21.74%)
Metal drinks can	624 (15.26%)	Metal drink cans	313 (9.15%)	Plastic packaging	552 (13.23%)
Plastic packaging	319 (7.80%)	Cigarette butt	277 (8.09%)	Plastic bottle	341 (8.17%)
Plastic bottle lid	246 (6.02%)	Plastic packaging	251 (7.33%)	Metal drinks can	313 (7.50%)
Crisp packet	226 (5.53%)	Plastic bag	213 (6.22%)	Plastic bag	226 (5.42%)
Chocolate wrapper	216 (5.28%)	Metal bottle cap	90 (2.63%)	Sweet wrapper	211 (5.06%)
Paper/cardboard packaging	201 (4.92%)	Styrofoam/plastic fragment	89 (2.60%)	Paper/cardboard packaging	189 (4.53%)
Sweet wrapper	182 (4.45%)	Clothing	87 (2.54%)	Chocolate wrapper	180 (4.31%)
Plastic bag	174 (4.26%)	Plastic bottle	84 (2.45%)	Plastic bottle lid	151 (3.62%)
Face mask	161 (3.94%)	Metal fragment	70 (2.05%)	Cigarette butt	124 (2.97%)

Table 8 Comparison of product types between Dundee, Enfield and Richmond.

In Enfield, which is an entirely inland location, material fragments do not feature in the top ten types of litter. In contrast, in Richmond (riverine) and Dundee (coastal), plastic fragments account for 29.87% and 21.74% respectively. Fragments of metal also feature in the top ten items found in Richmond.

In Richmond and Dundee, 35.33% and 25.36% of litter was fragmented whereas in Enfield this was only the case for 1.49% of litter. As such, more fragments of litter seem to appear in water-based environments than inland locations.

These differences highlight how litter varies spatially and reinforces Planet Patrol's assertion that litter policies will be most effective when guided by local insights.

**MORE FRAGMENTS  
OF LITTER SEEM TO  
APPEAR IN WATER-  
BASED ENVIRONMENTS  
THAN INLAND  
LOCATIONS.**

## PRODUCT BRAND

Of the three locations, the following percentage of litter was branded: 64.78% in Enfield, 20.1% in Richmond and 26.91% in Dundee. Table 9 compares the product brands found in each of the three locations. These figures are based upon branded items. Any 'unbranded' or 'unknown' litter types have been

excluded from the analysis. Across all three locations, the only two brands to feature in every 'top ten' were Coca Cola and Cadbury.

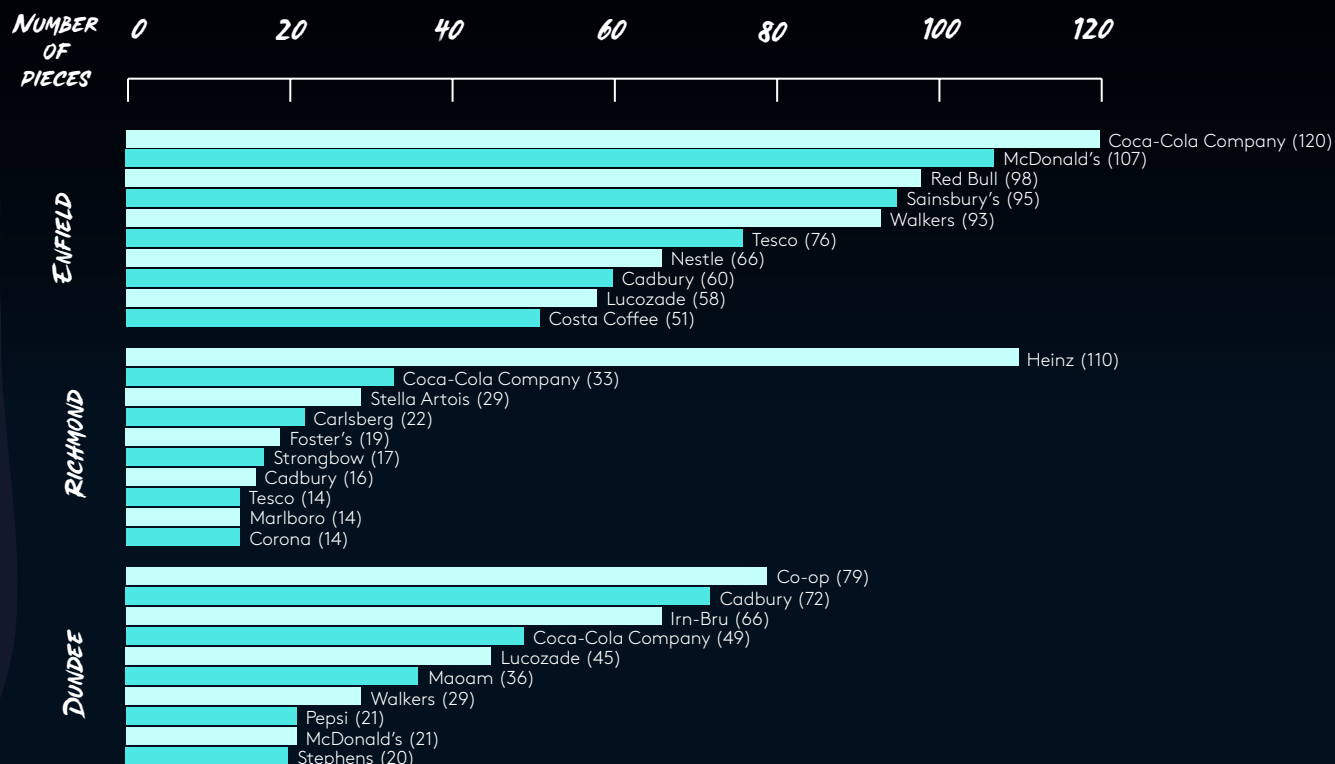


Figure 9 Comparison of litter brands between Dundee, Enfield and Richmond.

The high percentage of branded litter in Enfield and lower percentage in the other areas could be due to several factors. First, we have seen that in Richmond and Dundee, 35.33% and 25.36% of litter was fragmented. This breakage makes it often not possible to discern the brand information of a product. Enfield, in comparison, reported more litter with clearly visible brand information.

The riverine and coastal environments of Richmond and Dundee also make the brand information harder to identify. Silt and microorganisms in the water, glare from the sun and friction from waves all degrade littered items over time.

As an inland environment, the litter in Enfield could have been logged closer to the 'time of dropping'. It is likely that the area has street cleaning services, whereas this is clearly not the case

in a river or coastlines. This means that in Enfield, the brand information is less likely to be degraded at the time of collection.

This brand disparity between locations has repercussions for extended producer responsibility (EPR). Inland, where brands are more identifiable, it is generally easier to extend and track producer responsibility than in riverine and coastal locations. This creates bias in the system which could allow producers to avoid responsibility for a proportion of their products.



## PARENT COMPANIES

Table 10 shows the parent companies of all branded litter from across the three locations in 2021. Again, unbranded or unknown items were excluded from the analysis.

Coca-Cola Company and PepsiCo feature in the top ten parent brands across all three locations. The parent companies analysed are for brands with more than three pieces of litter logged.

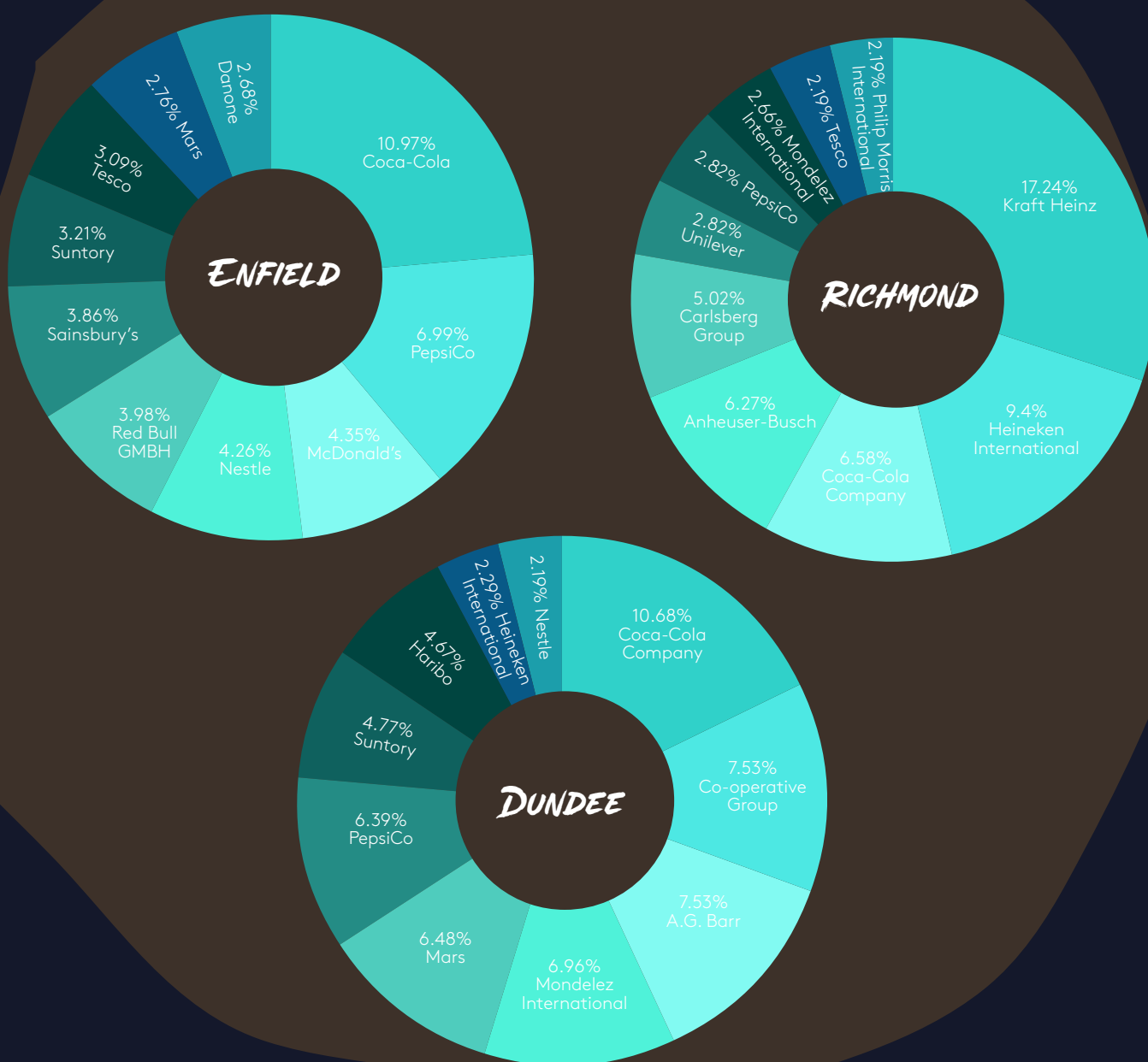


Figure 10 Comparison of parent companies responsible for litter in Dundee, Enfield and Richmond.

### 3.5 UK PRODUCT MATERIALS

In policy and in the media, emphasis is placed upon single-use plastics. However, it is important to remember that products made from other materials are also significant pollutants.

Table 11 shows the material composition of litter logged in the Planet Patrol app in 2021, 2020 and 2019. The number of pieces of each material type and percentages of litter for each year are also displayed.

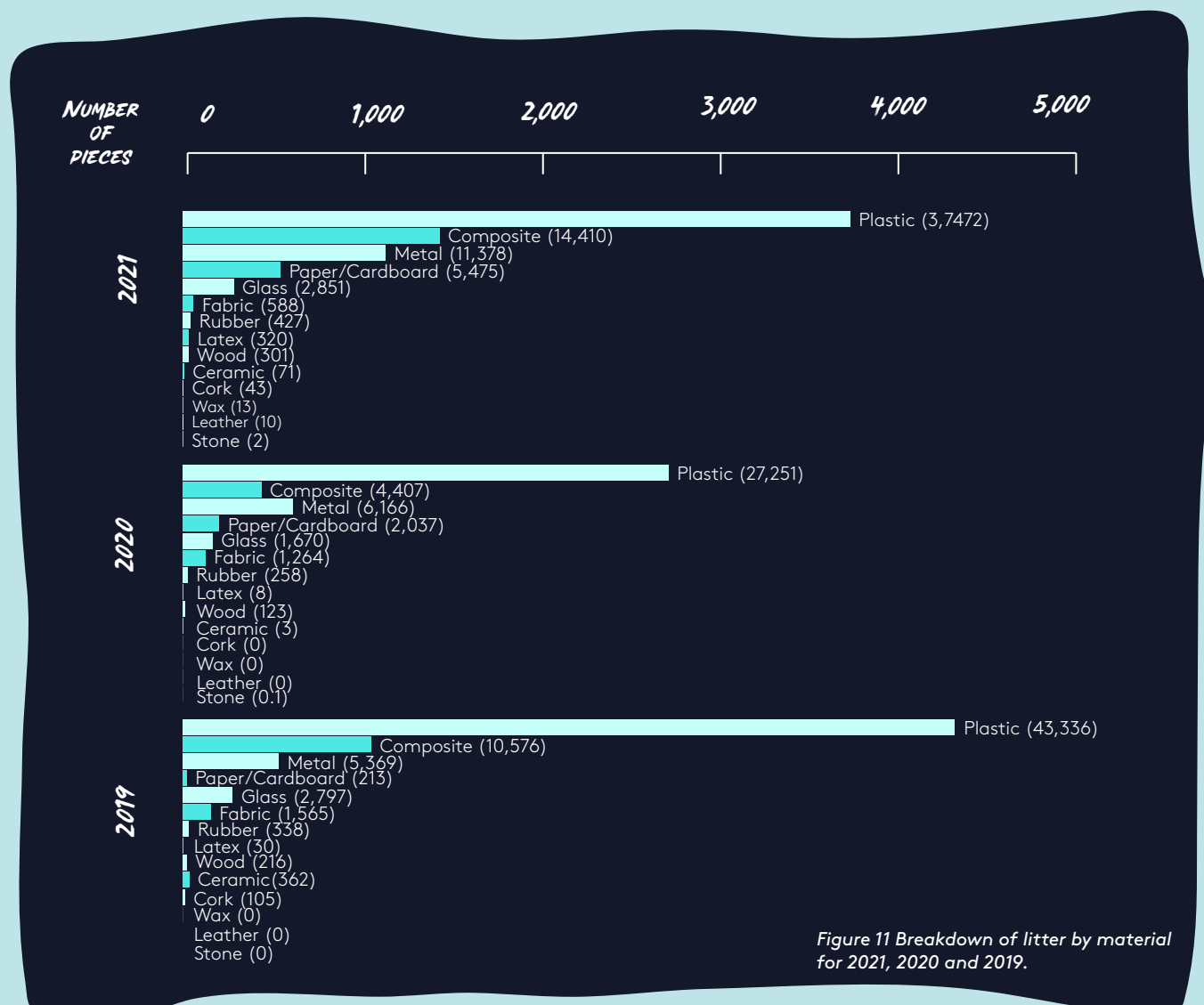


Figure 11 Breakdown of litter by material for 2021, 2020 and 2019.

Comparing the percentages of litter made from plastic materials over the three years offers a positive insight. While plastics accounted for 66.8% of litter in 2019, this figure dropped to 51% in 2021. This 16% reduction suggests a shift away from plastic materials in the UK. It can be assumed that a combination of awareness raising, public pressure, government policy and collective action have contributed to this decrease. While there is further to go, this finding gives hope that we are moving in the right direction with reducing plastic materials.

Table 11 shows that, since 2019, there has been an increase in proportions of litter made from other non-plastic materials, notably metal, paper and cardboard. Metal materials have increased by 7.2% with paper and cardboard showing a similar trend with a 7.1% rise. Interestingly, glass materials have shown very little change since 2019.

While paper and cardboard are quicker to breakdown compared

with plastics, metal products are resource intensive and can remain in the environment for many years. Although metal products can be recycled, if they are not disposed of correctly, they are still environmental pollutants. It is positive that we are seeing fewer plastic products, but it is evidently insufficient to replace one material with another, we must cut down consumption to avoid these unintended consequences.

Breaking down the logged litter by material shows that plastics form only part of the problem. Current efforts to tackle litter pollution in the UK focus predominantly upon plastic waste. The new Plastic Tax is one such example. This legislation certainly has the potential to lower the amount of plastic leaking into the environment, but on its own it does not address the entire problem. As 48.9% of logged litter is made of one or more non-plastic material, we need more inclusive litter-focussed legislation to effectively reduce waste overall.



### 3.6 PRODUCT TYPES

With 187 product types analysed, the breadth of pollution in the UK is clear. Table 12 shows the 20 most commonly logged types of litter in the Planet Patrol app in 2021. Both the number of pieces and the percentage of the total litter is included. For further reference, a full list of all 187 product types can be found in the appendices.



**PLASTIC FRAGMENTS  
WERE THE MOST  
FREQUENTLY LOGGED  
PRODUCT TYPE IN  
2021, ACCOUNTING FOR  
14.4% OF ALL LITTER  
COLLECTED.**

Rank	Type	Number	Percentage
1	Plastic fragment	10549	14.38%
2	Metal drinks can	9002	12.27%
3	Plastic packaging	7703	10.50%
4	Plastic bottle	7270	9.91%
5	Cigarette butt	5514	7.52%
6	Paper/ cardboard packaging	4115	5.61%
7	Plastic bag	2590	3.53%
8	Crisp packet	2343	3.19%
9	Glass bottle	2314	3.15%
10	Sweet wrapper	2115	2.88%
11	Chocolate wrapper	2056	2.80%
12	Plastic bottle lid	1871	2.55%
13	Styrofoam/ polystyrene fragment	1338	1.82%
14	Face mask	1127	1.54%
15	Metal bottle cap	980	1.34%
16	Plastic cup	931	1.27%
17	Plastic cup lid	777	1.06%
18	Tissue/ paper towel	714	0.97%
19	Wet wipe	635	0.87%
20	Glass fragment	528	0.72%

Table 12 The twenty most commonly logged litter types of 2021.



Despite the wide variety of product types identified, just 10 types of litter made up 73% of records in the Planet Patrol app. When considering the top 20 types, this figure rises to 88%. Therefore, a relatively short list of products makes up the majority of pollution reported. This can be seen as a positive: policy changes to a few key industries could create a significant reduction in litter.

One challenging finding concerns plastic fragments. Plastic fragments were the most frequently logged product type in 2021, accounting for 14.4% of all litter collected. Once broken down, this plastic is difficult to trace back to a source. This means that the sources of plastic fragments are unlikely to be

held accountable. Adding to the problem, the smaller plastic fragments become, the harder they are to remove from the environment. As they become microplastics, they are more difficult to monitor and measure. As a result, there is limited information available on the scale of this problem. Plastic fragments and microplastics are not mentioned as part of the UK’s new Environment Bill and as Planet Patrol’s most common product of 2021, this policy neglect is highly concerning.

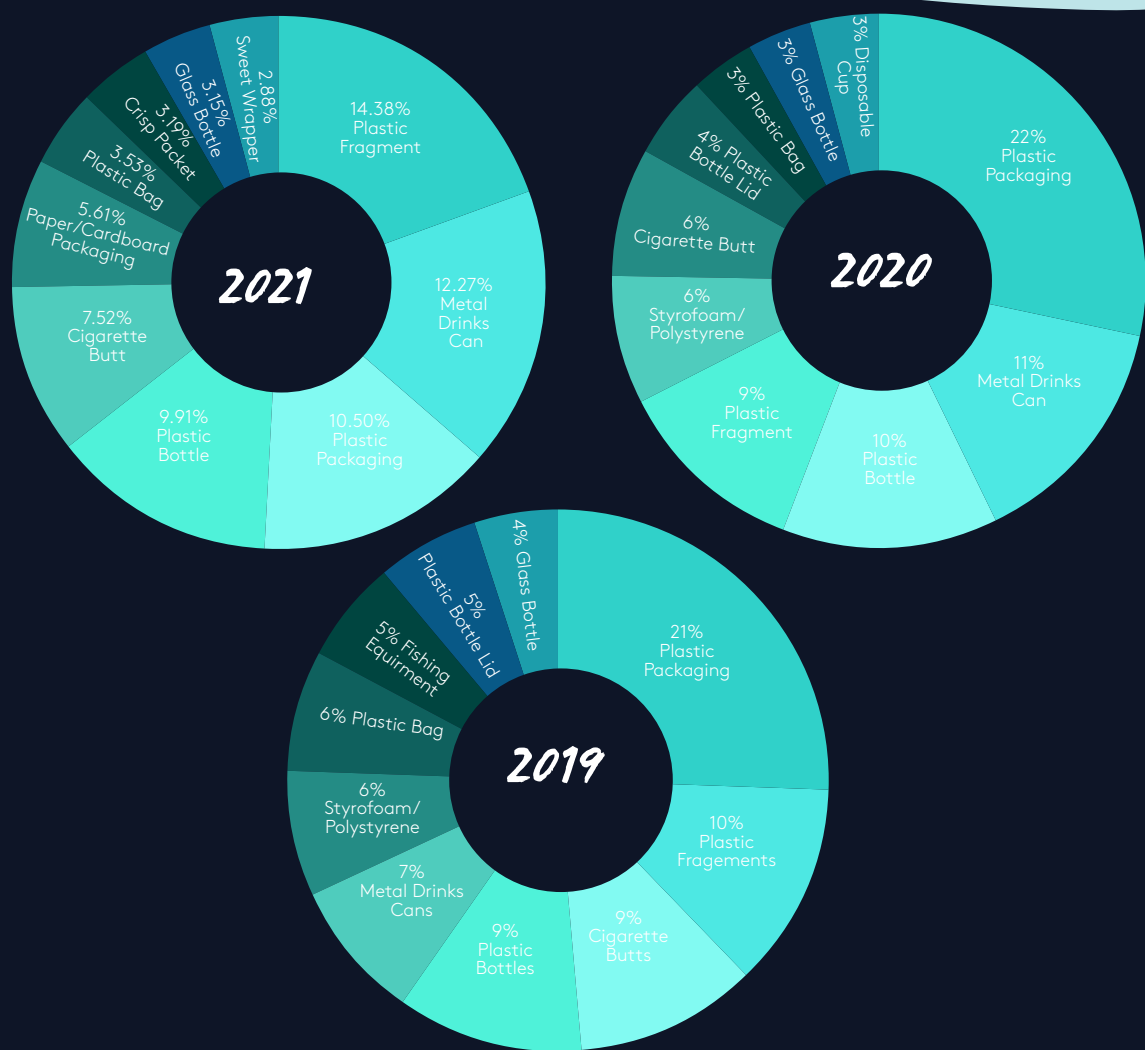


Table 13 compares the ten most logged litter types from 2019, 2020 and 2021 by the percentage of the total records.

Plastic packaging was the most frequently reported litter across both 2019 and 2020. Yet, in 2021 it has been overtaken by plastic fragments and metal drinks cans. In 2019, metal drinks cans formed 7% of the total litter reported but have since increased

to 12.3%. This rise supports the trends observed when analysing the product materials. As plastic packaged drinks are losing popularity, many ready-to-do drinks are now offered in cans as an alternative.

### 3.6.1 PRODUCT TYPES BY UK REGION

Table 14 below shows a breakdown of the types of litter logged in the four most engaged UK regions.

London		Southeast		Southwest		Scotland	
Type	% In region	Type	% In region	Type	% In region	Type	% In region
Plastic fragment	13.77%	Plastic packaging	15.62%	Plastic fragment	31.28%	Plastic fragment	15.36%
Metal drinks can	12.41%	Plastic fragment	13.82%	Metal drinks can	10.19%	Plastic bottle	14.98%
Plastic packaging	9.94%	Metal drinks can	11.04%	Plastic packaging	7.66%	Metal drinks can	13.65%
Plastic bottle	9.44%	Plastic bottle	8.55%	Plastic bottle	7.50%	Plastic packaging	10.94%
Cigarette butt	5.58%	Sweet wrapper	6.01%	Cigarette butt	7.30%	Plastic bag	4.83%
Plastic bag	4.35%	Paper / cardboard packaging	4.45%	Crisp packet	3.68%	Glass bottle	4.18%
Paper / cardboard packaging	3.46%	Crisp packet	3.95%	Paper / cardboard packaging	3.32%	Paper / cardboard packaging	4.00%
Crisp packet	3.07%	Glass bottle	3.93%	Chocolate wrapper	2.58%	Sweet wrapper	3.53%
Plastic bottle lid	3.06%	Chocolate wrapper	3.80%	Plastic bag	2.34%	Chocolate wrapper	3.14%
Glass bottle	2.76%	Plastic bottle lid	3.21%	Fishing equipment	2.22%	Plastic bottle lid	2.67%

Table 14 Most commonly logged product types in the four most engaged UK regions.

Across London, the Southwest and Scotland, plastic fragments continued to dominate. A particularly large percentage of fragments were observed in the Southwest (31.28%). This, along with the prevalence of fishing equipment, could be linked to the region's large coastline. Not only will more of these litter types wash ashore, but it is more likely that plastic will be broken down by the waves. Planet Patrol also observed a high usage of the app in coastal Southwest areas which could again explain this trend.

In Scotland, 14.98% of reported litter was plastic bottles. Across the other regions, these bottles account only for 7.5-9.5% of collections. Interestingly, Scotland is ahead of England in terms of policy. They will be implementing a deposit return scheme for plastics and cans in 2023.<sup>9</sup> Despite small fluctuations, other product types showed similar percentages across the most engaged regions of the UK.



### 3.6.2 AN INTERNATIONAL COMPARISON

Planet Patrol's global app usage shows that commonly logged product types vary according to country. The 35 participating countries during 2021 are listed below in order of number of individual pieces of litter logged:

UK, Austria, Germany, Denmark, Spain, Netherlands, Australia, USA, France, Canada, Isle of Man, Egypt, Italy, Greece, Ireland, Cyprus, Chile, Belgium, Sweden, Croatia, Guadeloupe, Switzerland, Hong Kong, Portugal, India, Ukraine, Russia, South Africa, Saudi Arabia, Cape Verde, Romania, Philippines, Laos, Brazil, Almería.

Four countries had more than 1,000 pieces of litter logged in 2021: UK (73,362), Austria (4,511), Germany (2,400), Denmark (1,295). We share a breakdown of the ten most commonly logged types of litter in each of these places to compare with the product types found in the UK.

Table 14 shows the ten most commonly logged types of litter in the UK, Austria, Germany and Denmark. Percentages of each type of litter in each country are shown in brackets and rounded to the nearest whole number. Common items between the four countries are highlighted.

UK (73,362)	Austria (4,511)	Germany (2,400_)	Denmark (1,295)
Plastic fragment (14%)	Cigarette butt (61%)	Cigarette butt (38%)	Cigarette butt (40%)
Metal drinks can (12%)	Plastic fragment (9%)	Metal bottle cap (12%)	Plastic fragment (15%)
Plastic packaging (11%)	Paper / cardboard packaging (5%)	Plastic packaging (8%)	Paper / cardboard packaging (8%)
Plastic bottle (10%)	Metal bottle cap (2%)	Plastic fragment (8%)	Aluminium foil (6%)
Cigarette butt (8%)	Plastic packaging (3%)	Glass bottle (7%)	Sweet wrapper (4%)
Paper / cardboard packaging (6%)	Metal drinks can (2%)	Paper / cardboard packaging (6%)	Plastic packaging (4%)
Plastic bag (4%)	Aluminium foil (2%)	Face mask (3%)	Metal drinks can (3%)
Crisp packet (3%)	Metal fragment (2%)	Plastic bag (2%)	Styrofoam / polystyrene fragment (3%)
Glass bottle (3%)	Plastic bottle (2%)	Glass fragment (2%)	Cigarette box (2%)
Sweet wrapper (3%)	Sweet wrapper (1%)	Metal drinks can (2%)	Metal bottle cap (2%)

Table 15 The most commonly logged product types in UK, Austria, Germany and Denmark.

Reports of plastic fragments, metal drinks cans, cigarette butts and paper or cardboard packaging were common across all four countries. Even so, each product made up a different percentage of the total litter collected. Most striking are the figures for cigarette butts in Austria, Germany and Denmark where they accounted for 61%, 38% and 40% respectively. Compared to just 8% in the UK, these records demonstrate how different litter pollution can be between countries. It is vital that reduction strategies are country-specific if they are to be effective.

There are also observable differences in plastic bottle recordings between the countries. Where these products account for 10% of litter in UK, they form just 2% in Austria and are not present in the top ten items for Germany or Denmark. This difference

is highly likely to be linked to the existence of a Deposit Return Scheme (DRS) in parts of Europe, including in these three countries. This scheme incentivises consumers to return their bottles to the source. Although a DRS is planned for the UK, it will not be in operation until 2023 in Scotland or 2024 for the rest of the UK.

Despite the DRS in Europe, metal drinks cans were among the top ten most commonly logged items across these countries. However, due to the greater spatial and temporal resolution of data collected across the UK, we cannot assume that the data from Austria, Germany and Denmark is as representative of litter in these countries as the dataset is for the UK. As such, we cannot comment on the success of their DRSs. Instead, this comparison table is to show the variations in litter logged on Planet Patrol's app in 2021.

### 3.6.3 PLANET PATROL & EU SINGLE-USE PLASTIC (SUP) DIRECTIVE

The EU Single-Use Plastic Directive has compiled a list of their ten biggest polluting litters. Table 16 compares the items covered in the EU SUP Directive to the top ten items most logged in the Planet Patrol app in 2021. The common items between the two lists are highlighted in yellow.

For this analysis, only clearly identifiable items were included. These are defined as items that can be directly attributed to a source. To meet this standard, the following non-specific categories of 'Plastic fragment', 'Plastic packaging', 'Paper /

cardboard packaging', 'metal fragment', 'glass fragment' and 'Styrofoam/polystyrene fragment' have been removed. Several of these items would otherwise have appeared in the Planet Patrol top ten (plastic fragment, plastic packaging, paper and cardboard packaging).

\* Shows Planet Patrol litter types that have been grouped in line with the European Commission groupings for comparability. The grouped types are specified in brackets.

Rank	EU Single Use Plastic Directive litter items	Planet Patrol litter items
1	Plastic cotton buds	Plastic beverage container* (plastic bottle and plastic bottle lid)
2	Plastic cutlery, plates, straws & stirrers	Metal drinks can
3	Plastic sticks for balloons and balloons	Crisp Packets/Sweet wrappers* (crisp packet, sweet wrapper, chocolate wrapper)
4	Polystyrene food containers	Cigarette butt* (cigarette butt and filter)
5	Plastic cups for beverages	Plastic bags
6	Plastic beverage containers	Glass bottle
7	Cigarette butt	Plastic cups for beverages* (plastic cup and plastic cup lid)
8	Plastic bags	Face mask
9	Crisp Packets/Sweet wrappers	Metal bottle cap
10	Wet wipes/Sanitary items	Wet wipes/Sanitary items* (wet wipes, tampons, tampon applicator, sanitary towels, condoms, needles /syringes)

Table 16 A comparison between Planet Patrol's top ten products and those of the EU SUP Directive.

There is a difference between the litter reported in the Planet Patrol app and the ranking published by the EU SUP Directive. Notably, plastic beverage containers rank first for Planet Patrol but linger at position six on the EU SUPD-directive. Again, this could be linked to the existence of DRs in Europe.

The difference could also be explained by the environments in which this litter has been logged. The EU SUP Directive list has been based upon litter collections in coastal environments whereas the Planet Patrol findings are based upon litter collected across both terrestrial and coastal environments.

We have seen a high prevalence of metal drinks cans among Planet Patrol's findings, both in the UK and in Austria, Germany and Denmark. This suggests that by focusing exclusively on plastics, the EU SUP Directive is missing out on a prominent source of pollution. It must also be noted that because the EU SUP Directive pre-dates the pandemic, covid-related litter, which features on Planet Patrol's list, remains absent from theirs. The EU SUP Directive should be updated to include disposable facemasks and gloves, along with the aforementioned metal drinks cans.



## 3.7 PRODUCT INDUSTRIES

### 3.7.1 DRINKS

#### Drink containers

The drinks industry is responsible for any litter associated with hot and cold soft and alcoholic beverages. This places plastic bottles, glass bottles, metal cans, takeaway cups, drinks pouches, takeaway lids and straws, plastic bottle lids and metal bottle caps within their remit. A complete list of these items can be found in the appendices. Together, these products account for 33.6% of litter (24,609 items) logged in 2021 making the drinks industry the largest polluting industry in this report. This is consistent with Planet Patrol findings in 2020, where the beverage industry was responsible for 35.02% of litter logged.

Of these products, the main contributors were found to be metal drinks cans (36.6%, 9002 items), plastic bottles (29.5%, 7270 items), glass bottles (9.4%, 2314 items) and plastic bottle lids (7.6%, 1871 items). The remaining litter types each made up less than 4% of the total items associated with the beverage industry.

**BEVERAGE INDUSTRY  
RESPONSIBLE FOR 35.02%  
OF LITTER LOGGED.**

The sub-sectors of the drinks industry are not all equally implicated. Of the drink-related products that citizen scientists logged with brand information, a total of 33.1% (5147 pieces) was linked to alcoholic beverages. In fact, alcoholic drink litter, including cans, metal bottle caps and glass bottles, comprised 20% of all branded litter logged on the app. One reason for this could be consumer behaviour. In 2016, Keep Britain Tidy reported that people litter more often when under the influence of alcohol<sup>10</sup> due to increased confidence and decreased guilt. Even so, the responsibility does not solely sit with consumers. The high proportion of alcohol-based litter logged in 2021 highlights that this is a specific industry that can do more to educate consumers on the recycling of their products and explore innovations for alternatives.

A further 3.3% (954) of the branded litter items reported were water bottles. In 2020, water bottles made up 4.58% of branded litter. In 2019, water bottles made up 3.97% of branded litter. Wales is ahead of the curve. They understand that this litter can be prevented with relative ease. For the past three years, the Welsh government has supported Refill and determined to become the world's first refill nation. If the rest of the UK could follow their lead and implement registered refill points across the country, bottled water need not be such a frequently purchased (and littered) commodity.





### Straws

In October 2020 a ban on plastic straws came into force in England. We looked at Planet Patrol's data in England in the year before the ban (October 2019 - October 2020) and the year after the ban (October 2020 to October 2021) to compare levels of plastic straws and monitor the ban's success. See Table 17 below:

**ALTHOUGH THE PLASTIC STAW BAN MAY HAVE CAUSED A SHIFT IN THE MATERIALS USED TO MAKE SINGLE-USE STRAWS, IT HASN'T NECESSARILY CONTRIBUTED TO A REDUCTION IN THEIR OVERALL USE.**

Straw type	Number of pieces logged (2019-2020)	Percentage of all litter types logged (2019 – 2020)	Number of pieces logged (2020-2021)	Percentage of all litter types logged (2020 – 2021)
Plastic straw	228	0.59%	274	0.41%
Paper straw	25	0.06%	105	0.16%

**Table 17 Breakdown of straw litter before and after the ban.**

In the year before the ban, Planet Patrol collected 253 straws. Of these, 90.12% were plastic and 9.88% were paper. Following the ban, the split between plastic and paper straws shifted considerably. Plastic straws still made up 72.3% of records, however it cannot be determined from Planet Patrol's dataset if these products were littered before the ban. The remaining 27.7% were made from paper. These records suggest that post-ban, a larger proportion of logged straws were made from paper.

Straws accounted for 0.65% of total litter pre-ban. This percentage decreased marginally to 0.57% in 2021 following the ban. This indicates that although the plastic straw ban may have caused a shift in the materials used to make single-use straws, it hasn't necessarily contributed to a reduction in their overall use. While a decrease of plastic should be counted as a win, there are still more steps to take. For instance, paper straws are often made of composite materials to prevent them from disintegrating during use. As a result, many paper straws, such as those from McDonald's, are still not recyclable.



### 3.7.2 TOBACCO

The UK government report that cigarette butts are the most frequently littered item in England<sup>11</sup> but this is not consistent with Planet Patrol's 2021 findings. Cigarette butts ranked 5th, accounting for 7.52% of total litter. One possible reason is that users might feel less inclined to log multiple small sized items on the Planet Patrol app due to repetition. Another could be that users are less likely to pick up butts due to hygiene concerns, especially during the covid-19 pandemic.

Regardless of whether cigarette butts are the 1st or 5th most prevalent litter type, it can be agreed that work must be done

to tackle this issue. As well as the economic impact of clean ups upon local authorities, and in turn the tax payers, these filters are environmentally harmful. They take years to break down due to the presence of a plastic (cellulose acetate) filter within the cigarette and expel toxic chemicals into the air, ground and water.

The government is currently working legislation into the Environment Bill which would require the tobacco industry to pay out to cover the costs of cigarette disposal. Planet Patrol supports extending producer responsibility in this manner.





### 3.7.3 RETAIL

The retail industry is primarily responsible for plastic bag pollution, including both single-use carriers and bags for life. Defra reported that the UK's Plastic Bag Levy has led to a 95% decrease in the number of single-use plastic bags sold by retailers since 2015.<sup>12</sup> However, Planet Patrol's 2021 findings on bags does not support this statement. Bags accounted for 3.5% of the total litter collected in 2021 and featured in our top ten product types. While this is below the 2019 figure (6%), more plastic bags were logged this year than in 2020 (3%). Our findings suggest that, so far, the levy is not working as intended to reduce levels of plastic bag litter.

Table 18 reveals that the majority of these bags did not have a clearly identifiable brand. Of those that did, the most frequently logged all originated from supermarkets.

Brand	Number of pieces	Percentage
Unknown/unbranded	2249	87.20%
Tesco	78	3.02%
Sainsbury's	47	1.82%
Co-op	34	1.32%
Asda	17	0.66%
Lidl	10	0.39%
Morrisons	7	0.27%
Londis	7	0.27%
Aldi	7	0.27%
Subway	6	0.23%

Table 18 Plastic bags split by unbranded and branded in 2021.



Table 19 breaks down the branded bags to understand which supermarkets contributed the largest percentages of plastic-bag litter to UK environments.

Brand	Percentage
Tesco	23.64%
Sainsbury's	14.24%
Co-op	10.30%
Asda	5.15%
Lidl	3.03%
Morrisons	2.12%
Londis	2.12%
Aldi	2.12%
Subway	1.82%
Iceland	1.82%

Table 19 Depicting the brands contributing the most plastic bag litter in 2021.

Tesco are found responsible for 23.64% of plastic bags logged. As the largest UK supermarket brand, this figure could reflect a greater number of individual stores than a sale of more plastic bags within each shop. Never-the-less, Tesco must take responsibility for their contribution to UK litter.

Many supermarkets now only offer bags for life. These bags contain, on average, three times as much plastic as their single-use counterparts. This means that they must be used at least four times to have an environmental impact equivalent to a single-use bag. Unfortunately, this is not the case: the average UK household purchased approximately 57 'Bags for Life' in 2019, making the name 'Bag for a Week' more suitable. It's clear these bags are not being reused as intended and are not effective solutions to reduce the number of plastic carriers being produced.

#### Covid-related litter

### 3.7.4 MEDICAL AND HYGIENE

The medical and hygiene industry is an extremely pertinent point of discussion given the covid-19 pandemic. In 2021, PPE-related litter made up 2% of all litter logged on the Planet Patrol app. This includes face masks (1.54%) and disposable gloves (0.44%).

There were 1127 individual records of facemasks, equivalent to at least three items being collected every single day of the year. In fact, since the category of 'facemask' was added to the app in July 2020 when these became mandatory in the UK, they have become the 14th most frequently logged item.

Considering how long facemasks have been in use, such a high ranking in our dataset suggests widespread prevalence in a

relatively short space of time. That said, given the perceived risks associated with collecting and recording PPE, Planet Patrol app users could be less inclined to log items due to concerns around contamination, particularly in relation to the coronavirus pandemic. Therefore the number of PPE items recorded may be lower than expected.

#### Wet wipes

Even before the pandemic, hygiene products comprised a significant proportion of Planet Patrol's annual litter collection and 2021 was no exception. One in every hundred items logged was a wet wipe making them the 19th most frequently logged product.

In 2020, wet wipes were the 13th most common litter item logged (2.23%, 963 pieces) in the Planet Patrol app and in 2019 they were the 24th most common litter item (0.39%, 193 pieces).

The increase from 2019 to 2020 could be reflected by the increase in sewage discharges: They have increased from 292,864 incidents in 2019 to 403,171 in 2020 – a 37% rise.<sup>13</sup>

Considering that the UK collectively uses 11 billion wet wipes each year, this ranking is no surprise. With 90% of wet wipes containing plastic in the UK, this comes at a cost. As the plastic breaks down into microplastics, it can be ingested by marine and riverine animals, and enter into our food chain and water supply. To tackle the problem, MP Fleur Anderson introduced the Plastics (Wet Wipe) Bill in November 2021 which Planet Patrol supports.

### 3.7.5 FOOD

Packaging from the food industry formed a significant proportion of litter collected by Planet Patrol's volunteers. Some of the most prevalent are crisp packets and sweet wrappers which made up 8.9% of all litter logged in the app. These products are commonly made using composite materials in which layers of plastic and metal are fused

together to make a film known as aluminium-plastic laminate. This material is, by nature, difficult to recycle. This is made harder still by the lack of kerbside recycling infrastructure for these products in the UK and inadequate infrastructure to cope with more complex materials. To recycle a crisp packet, it must be taken to a designated drop off point. As such, Planet Patrol calls for improvements to this infrastructure.

## 3.8 PRODUCT COMPANIES

### 3.8.1 BRANDS

Litter can sometimes be traced back beyond its general industry. Brand information was clearly visible on 36.05% of litter logged in 2021. As a result, the very same images, originally intended for promotion, can be used to hold producers to account.

Of the 26,409 branded litter items logged, 1,755 brands were identified in the UK. Table 20 breaks down this information to reveal the top twenty most logged brands of litter in the UK in 2021.

Brand	Number	Percentage of branded litter
Coca-Cola Company	1453	5.50%
McDonald's	1169	4.42%
Cadbury	938	3.55%
Red Bull	915	3.46%
Walkers	870	3.29%
Lucozade	767	2.90%
Stella Artois	677	2.56%
Tesco	606	2.29%
Budweiser	539	2.04%
Strongbow	516	1.95%
Monster	513	1.94%
Pepsi	434	1.64%
Nestle	370	1.40%
Fanta	355	1.34%
Mars	342	1.29%
Foster's	329	1.24%
Corona	300	1.14%
Costa Coffee	287	1.09%
Sainsbury's	281	1.06%
Heinz	253	0.96%

Table 20 The top twenty brands responsible for the most litter logged in 2021.



To assess the significance of these findings, we compare our 2021 brand information with our UK records from 2019 and 2020. This chart includes the percentage of the total branded litter collected each year.

2021		2020		2019	
Brand	Percentage of branded litter	Brand	Percentage of branded litter	Brand	Percentage of branded litter
Coca-Cola Company	5.50%	Coca-Cola Company	6.8%	Coca-Cola Company	7.4%
McDonald's	4.42%	McDonald's	3.9%	Cadbury	5%
Cadbury	3.55%	Budweiser	3.6%	Walkers	4.7%
Red Bull	3.46%	Cadbury	3.2%	Mars	3.2%
Walkers	3.29%	Walkers	3.2%	Tesco	3.2%
Lucozade	2.90%	Lucozade	3.1%	Lucozade	3%
Stella Artois	2.56%	Red Bull	2.6%	Boost Energy	2.9%
Tesco	2.29%	Stella Artois	2.5%	Pepsi	2.2%
Budweiser	2.04%	Tesco	2.2%	Stella Artois	2.1%
Strongbow	1.95%	Pepsi	1.7%	McDonald's	2.1%

Table 21 A comparison of the most polluting brands in 2021, 2020 and 2019.

For the third year in a row, Coca-Cola Company was the most commonly logged brand on the Planet Patrol app. Although the percentage of Coca-Cola Company branded litter has dropped by 1.9% since 2019, they still account for 5.5% of findings and for more than 1 in every 10 pieces logged.

McDonald's is also a recurring culprit branded litter, accounting for 4.42% in 2021. This is an increase from 2020 but

the brand continues to rank second behind Coca-Cola. Also common in the top-ten across all three years are Cadbury, Walkers, Lucozade, Stella Artois and Tesco. These consistently high litter contributions from large brands highlights a need for greater producer responsibility.



### 3.8.2 PARENT COMPANIES

Of the ten brands identified in section 3.8.1 eight are owned by a larger parent company. In linking litter to the parent company, not the brand, we can see that some producers are responsible for a greater proportion of pollution than is immediately obvious.

A total of 243 parent companies were identified. For any brands logged with less than three pieces of litter, the parent company was not identified in this report. As a result, the following analysis does not include all 1,799 brands discussed in the section above.

Table 22 shows the ten parent companies associated with the most branded litter in 2021. The parent companies analysed are the parent companies for brands with more than three pieces of litter logged



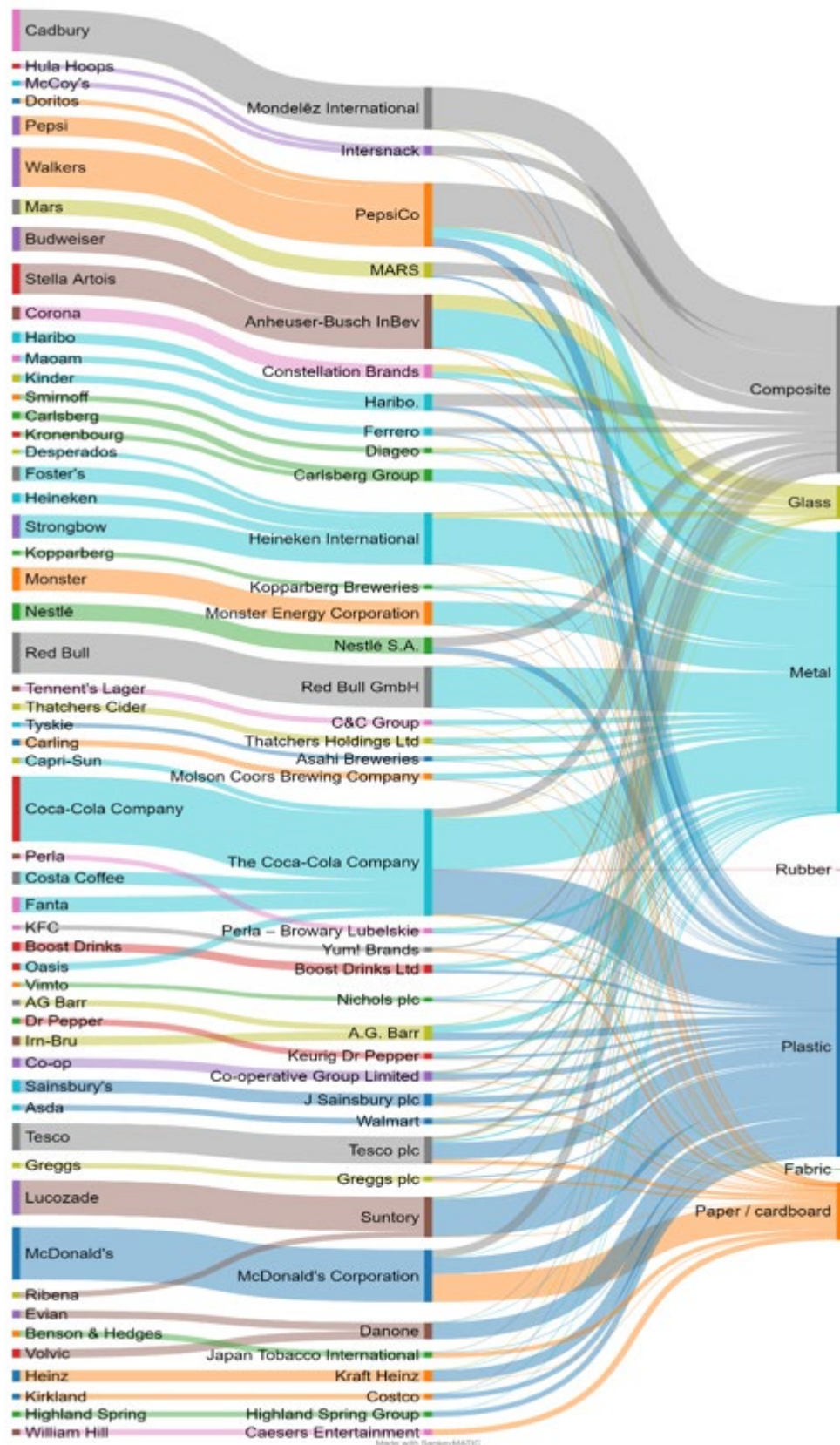
Parent company	Number of pieces	Percentage
Coca-Cola Company	2648	11.07%
PepsiCo	1722	7.20%
Heineken International	1261	5.27%
Anheuser-Busch	1227	5.13%
McDonald's	1169	4.89%
Mondelez International	965	4.04%
Red Bull GmbH	915	3.83%
Suntory	904	3.78%
Mars	727	3.04%
Nestle	645	2.70%



*Table 22 The ten parent companies associated with the most branded litter reported in 2021 in the UK*

When broken down to parent companies, the specific corporate responsibility becomes clear. Just 20 parent companies were responsible for 67.83% of branded litter in 2021. An even smaller group of ten parent companies produced 50.95%. That's over half of the branded litter logged on the Planet Patrol app. With so few corporate players contributing so much litter in the UK, Planet Patrol calls for greater producer responsibility. As with identifying industries, this is another way that informed targeted action can influence a large proportion of litter in the environment.

**TWENTY PARENT  
COMPANIES WERE  
RESPONSIBLE FOR  
67.83% OF BRANDED  
LITTER IN 2021.**



Sankey diagram showing the proportion of the branded data associated with each brand (left), their parent company (middle) and material (right) for each brand that was logged

in the Planet Patrol app more than 100 times across the UK in 2021. The size of each bar is proportional. Diagram produced using SankeyMATIC (<https://sankeymatic.com/build/>).



Table 23 compares the parent companies responsible for the most branded litter in the UK in 2019, 2020 and 2021.

2021		2020		2019	
Parent company	Percentage	Parent Company	Percentage	Parent Company	Percentage
Coca-Cola Company	11.07%	Coca-Cola Company	12.2%	Coca-Cola Company	12%
PepsiCo	7.20%	Anheuser-Busch	8.6%	PepsiCo	8.7%
Heineken International	5.27%	PepsiCo	7.4%	Mondelēz International	5.3%
Anheuser-Busch	5.13%	Mondelēz International	4.2%	Mars	3.8%
McDonald's	4.89%	Heineken International	4%	Suntory	3.6%
Mondelēz International	4.04%	Suntory	3.8%	Anheuser-Busch	3.4%
Red Bull GmbH	3.83%	McDonald's	3.6%	Heineken International	3.4%
Suntory	3.78%	Nestle S.A.	3.3%	Tesco	3.3%
Mars	3.04%	Mars	3.3%	Nestle S.A.	3%
Nestle	2.70%	Tesco	2.7%	Boost Drinks	2.6%


Table 23 The parent companies responsible for the most branded litter in 2021, 2020 and 2019.

Every year, Coca-Cola Company has ranked as the parent company responsible for producing the most branded litter. PepsiCo, Heineken International, Anheuser-Busch, Mondelez International, Suntory, Mars and Nestle S.A. have all also ranked in the top ten for the past three years.



### 3.8.3 BRAND COMMITMENTS AND CORPORATE POLICY – DOES IT ADD UP?

Many of these brands and parent companies have made statements about tackling the litter they produce. Planet Patrol investigates these claims in Table 24. The top ten parent companies responsible for branded litter in 2021 are logged against the information contained in their Environmental Social Governance (ESG) statements. Information contained within the final column, 'Action against litter', was sourced from each parent company's website.



Each of the top ten parent companies made statements relating to packaging in their ESG statement. Statements generally focused upon material type, and volume and the ideal product disposal methods. There was little mention of their products leaking into the environment as litter.

Refillable packaging is mentioned in the ESG documents of four of the parent companies. This demonstrates a potential for changing business models and moving away from a single-use culture. However, the true commitment to this and its subsequent success is yet to be seen. Refill, particularly for the beverage industry, has the potential to significantly reduce litter.



Rank	Parent Company	Percentage of items logged by Planet Patrol (%)	Is packaging mentioned in ESG statements?	Materials specified	Is a reduction in packaging numbers mentioned?	Is refillable packaging mentioned?	Target dates	Action against litter
1	The Coca-Cola Company	11.66%	✓	Plastic and Metal	✓	✓	2025, 2030	Ambition to collect and recycle a bottle or can for each one sold by 2030. Supports litter clean ups.  Part of Working Group to advise DEFRA's Litter Strategy.
2	PepsiCo	6.98%	✓	Plastic	✓	✗	2020, 2025	Encourages people to get involved in litter clean ups.
3	Heineken International	5.12%	✓	Paper / Cardboard	✓	✗	N/A	Campaigns to reduce litter at festivals. Invested in a community litter reduction initiative.
4	Anheuser-Busch InBev	4.94%	✓	Plastic, Metal and glass	✓	✓	2025	Hold employee litter clean ups on World Environment Day.  Keep America Beautiful/Anheuser-Busch Environmental Grant Program.
5	McDonald's	5.00%	✓	Plastic	✓	✗	2025	Conducted a survey around littering. Litter clean ups around stores. Across the UK and Ireland, McDonald's staff collect 27 tonnes of litter every year. Three times a day they engage in litter patrols around every restaurant. They cover a total of 5,000 miles each week.
6	Mondelez International	3.88%	✓	None	✓	✗	2025	Signatory to the Business Call for a Global UN Treaty on Plastics Pollution.
7	Red Bull GmbH	3.94%	✓	Metal	✗	✗	N/A	Sponsors clean-up events.
8	Suntory	3.63%	✓	Plastic	✓	✗	2030	Supports clean-up events.
9	MARS	2.97%	✓	None	✓	✓	2025	Mars Wrigley Foundation's Litter Less Partnership. Sponsors litter clean ups.
10	Nestle S.A.	2.64%	✓	Plastic	✓	✓	2025, 2030	Sponsors litter clean-ups.

Table 24 Investigation of the ESG statement of the 10 most polluting parent companies of 2021.

## COCA-COLA COMPANY

The Coca-Cola website shares information about the steps they take to tackle litter.<sup>14</sup> As well as their pledge to collect and recycle a bottle or can for every new one sold by 2030, the company shares the following statement:

"The Coca-Cola system doesn't want to see any of our packaging end up where it shouldn't, so reducing littering is a big part of our new Sustainable Packaging Strategy in Great Britain."

They go on to say: "we've supported anti-litter and clean-up initiatives across the country for many years,

"We're also one of the companies who have agreed to join DEFRA's litter strategy working group which is launching a new national approach to tackling litter."

Discussing ocean pollution, Coca-Cola state:

"The accumulation of marine debris and its effect on the global marine ecosystem is a hot topic—and Coca-Cola aims to be part of the solution. From our perspective, it is unacceptable that packages—including Coca-Cola packages—end up in the wrong place, in our oceans and waterways or littering communities,

"No one can solve this issue alone, but together we can make a big change. That's why we work with partners around the world to reduce plastic waste, clean up existing waste and improve recycling .<sup>15</sup>

Across Coca-Cola Company's website, Planet Patrol found no solutions beyond litter clean ups and working with DEFRA on litter strategy. Language appeared vague with the solutions more appropriate for maintaining a positive public perception than reducing single-use plastics and metals from their products. To ensure full circularity and 100% recycling for their products, their action plans for tackling litter must be more clearly outlined.







## PEPSICO

Planet Patrol found the action plan for litter on PepsiCo's website to be even vaguer than that of Coca-Cola Company. PepsiCo's statement on recycling and sustainability<sup>16</sup> states:

"In order to ensure packaging doesn't end up as litter or in a landfill – and to help make Pepsi's environmental impact a positive one – we are working to accomplish the following goals as part of our 2025 packaging sustainability agenda ."

Beyond this initial sentence, we spotted no further mention of litter until the final section. They closed with a half-hearted call to action in which they encouraged their customers to, "get involved in trash pick-up efforts".



## MACDONALD'S

McDonald's have shown a more demonstrable commitment to litter reduction. In 2020, the company conducted a littering<sup>17</sup> survey to reveal those responsible and hold them to account. The results prompted a press release titled: "New research: 1 in 5 Brits Admits to Littering".

Planet Patrol is not convinced of the motive behind this survey. In placing emphasis on the consumer, it removes responsibility from McDonald's shoulders, despite their role in producing single-use products.

That being said, McDonald's do focus heavily on litter reduction around their stores:

"Across the UK and Ireland, McDonald's staff collect 27 tonnes of litter every year, on litter patrols that take place around every restaurant three times a day, covering a total of 5,000 miles each week."

While this is a positive step, Planet Patrol wonders if it would not be more efficient to reduce single-use material from products. This would cut down on litter and free up staff capacity to take on other tasks.





## RED BULL

Like other parent companies, Red Bull placate the consumer, without sharing specific targets or any solutions beyond litter clean ups and recycling promotion. In a Q&A on their website, the company addresses the steps they are taking against littering. They state:

"At Red Bull, we acknowledge our responsibility for the environment. We take the effects of carelessly throwing away waste in nature (so-called "littering") very seriously. That's why we are supporting initiatives such as "Reinwerfen statt Wegwerfen " to promote recycling and sustainable waste management ."<sup>18</sup>

While all parent brands support litter clean up campaigns, not one company shared concrete figures on their own litter reduction targets.



### 3.9 LOOKING FORWARD

As we arrive in Spring 2022, Planet Patrol's citizen scientists have already been working hard to log litter. Between 1st January and 31st March, a total of 3276 individual items were logged on the Planet Patrol app. As it stands, 62 people have already participated, sending their findings from eight countries across the globe. Records have arrived from the UK; USA; Portugal; Pakistan; Germany; France; Cyprus and Canada.

Of these reports, 2886 came from the UK which suggests that the 2022 results will be as UK-centric as the findings from 2021. To get a sense of the UK's litter-landscape so far, we take a preliminary look at the top product types logged in Table 25.

Type	Number of pieces	Percentage
Metal drinks can	540	18.71%
Plastic bottle	323	11.19%
Plastic packaging	305	10.57%
Styrofoam/polystyrene fragment	279	9.67%
Glass bottle	195	6.76%
Plastic fragment	162	5.61%
Cigarette butt	143	4.95%
Crisp packet	134	4.64%
Paper/cardboard packaging	91	3.15%
Face mask	69	2.39%

Table 25 The top product types logged in the UK during the first quarter of 2022.

Brand	Number of pieces	Percentage
Coca-Cola Company	90	6.26%
McDonald's	71	4.94%
Cadbury	69	4.80%
Red Bull	58	4.04%
Walkers	56	3.90%
Monster Energy	44	3.06%
Stella Artois	43	2.99%
Lucozade	37	2.57%
Strongbow	35	2.44%
Carlsberg	33	2.30%

Table 26 The top ten brands of litter identified in the first quarter of 2022.

While it is too soon to make assumptions, the reports on facemasks are already concerning. In 2021, these products accounted for 1.54% of litter. However, in the first three months of 2022, facemasks make up 2.39% of findings, even though under current guidelines they are no longer mandatory in the UK. This suggests that more discarded masks are building up in the environment. This increasing trend should be monitored throughout 2022.

Just under half (49.79%) of all pieces logged so far have been branded. So far, this proportion is higher than in 2021 where 36.05% of pieces were branded. However, we expect this figure to decrease once litter from beach-based clean ups is logged during the warmer months. It is at these events that the most brandless plastic fragments tend to be collected. Never-the-less, Table 26 shows the top ten brands logged in 2022 before the end of March.



Like 2021, the first figures from 2022 display a prevalence of litter from the drinks industry. Considering that since 2021, no further responsibilities have been applied to producers, this trend is unsurprising. If this pattern continues throughout 2022, it will serve only as further evidence that the drinks industry must be held accountable for their products throughout their entire life cycles.

Table 27 displays a breakdown of the litter reported so far in 2022, organised by most commonly found material.

In the first three months of 2022, plastic products make up less than 50% of the data. This highlights once again that we cannot afford to focus reduction efforts exclusively on one material, either in policy or in campaigning.

It remains to be seen if these trends will continue throughout 2022. Whatever the future holds, Planet Patrol is determined to continue to collect strong, people-powered data. We are confident that our dedicated team of citizen scientists will keep on with their clean-up efforts and make 2022 our most logged year to date.

Material	Number of pieces	Percentage
Plastic	1434	49.69%
Metal	576	19.96%
Composite	536	18.57%
Glass	198	6.86%
Paper / cardboard	111	3.85%
Rubber	13	0.45%
Fabric	6	0.21%
Wax	5	0.17%
Latex	4	0.14%
Wood	2	0.07%
Ceramic	1	0.03%

Table 27 The most commonly logged product materials of the quarter of 2022.





# GLOSSARY

<b>Circular economy</b>	An alternative to a linear economy (in which products are made, used and disposed). In a circular economy, finite resources are used for as long as possible. The maximum value is extracted from them before they are recovered and regenerated after they reach the end of their service life.
<b>Citizen science</b>	Involves the general public in scientific research. In this report, all findings are based upon people-powered data collection. This process can bring society, science and policy making closer together. <sup>19</sup>
<b>Composite</b>	A material which is formed when two or more different substances are combined. This creates a new material which has new properties compared to the original. <sup>20</sup>
<b>Deposit return scheme (DRS)</b>	A DRS introduces infrastructure that enables consumers to return drinks packaging made from different materials to dedicated collection points. Customers pay a deposit upon the sale of the item, which is returned when an item is accepted in the DRS collection point. A DRS will be introduced in Scotland in 2023 and will arrive in the rest of the UK by 2024.
<b>EU single-use plastics (SUP) directive</b>	Since July 2021, the EU is tackling the ten single-use plastic items most commonly found on Europe's beaches. The Directive is promoting sustainable alternatives to these items. The SUP Directive was not transposed into UK law before the end of the Brexit transitional period last year, so the UK government is not required to implement the Directive's requirements.
<b>Extended-producer responsibility (EPR)</b>	A policy approach which extends a producer's responsibility for a product beyond point of purchase. This makes a producer take accountability for the disposal of their product.
<b>Microplastic</b>	A small plastic of 5mm or less that is found in the environment as a result of plastic pollution.
<b>Single-use</b>	Something which is designed to be used once before being thrown away or recycled.
<b>Parent company</b>	A company which owns over 50% of another, giving it a controlling interest <sup>21</sup>
<b>Plastic bag levy UK</b>	Retailers of all sizes are required to charge 10p for single-use plastic bags (70 microns thick or less) across the England, Scotland and Wales and 25p in Northern Ireland. The aim of the charge is to reduce the number of plastic bags being produced, disposed of and littered, and to increase reuse rates.
<b>Plastic straw ban UK</b>	Since October 2020, single-use plastic straws, plastic cotton buds and drinks stirrers have been banned by the UK government. <sup>22</sup>
<b>Plastic Tax</b>	Introduced on 1st April 2022 – this tax aims to provide an economic incentive for businesses to use recycled plastic material in packaging. The requirement is that any packaging produced or imported into the UK, that contains less than 30% recycled plastic, will be taxed by weight.
<b>Plastics (Wet Wipe) Bill</b>	In November 2021, MP Fleur Anderson introduced the Plastics (Wet Wipe) Bill to prohibit the manufacture and sale of wet wipes containing plastic <sup>23</sup> . The Bill passed its first reading in the House of Commons, with the second reading scheduled for early May 2022.
<b>Theoretically Recyclable</b>	Litter is deemed theoretically recyclable in this report if it can be recycled by at least one UK council.





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