

Appendix 3

Results: Top 10 probabilities of litter items in the three OSPAR Regions

This is some descriptive analysis of the items that occurred most frequently in all hauls in each of the three OSPAR Regions, between 2012 and 2019. No attempt has been made to do any modelling of the data, to account for spatial bias or differences in haul characteristics (e.g., gear); these are simply what the raw data demonstrate. The implicit assumption is that the probability that an item is detected is the same in different areas and is not affected by the gear type. It is unlikely that either of these assumptions is true. For example, gears with a ‘tickler’ chain may be better at throwing light items such as plastic sheets into the water column – and hence catching them – than beam trawls). Also, there may be more of a certain litter item near the coasts than further out to sea. Thus, over-sampling of coastal regions could lead to biases in the construction of the top 10 as being ‘representative’ of the whole OSPAR Region.

Another consideration is that – as always – we can never be sure that differences are due to real differences or differences in the ways that litter items were categorised or recorded as present or absent for each haul. See the example of *Synthetic rope* in Bay of Biscay in 2014 below (Table 3).

With the above caveats, the tables below should give a flavour of the most common items found in the different OSPAR Regions over time. That is, the number of hauls that contained that litter item. Further work has been completed to develop theoretical approaches to generate measures of variability for these Top 10 lists. These use a Bayesian approach. This work has not been reported here but could form part of a more comprehensive approach to modelling Top 10 lists for the Regions.

Table 1: Greater North Sea Top 10 for Occurrences. The frequency of occurrence and the probabilities (as a percentage) are also provided using the total number of hauls as denominators. Total number of hauls were: 533 in 2012, 723 in 2013, 690 in 2014, 853 in 2015, 956 in 2016, 996 in 2017, 1025 in 2018 and 1013 in 2019. Plastic items are shaded grey.

	2012	2013	2014	2015	2016	2017	2018	2019
1	Synthetic rope 113 (21,2%)	Sheet 233 (32,2%)	Sheet 203 (29,4%)	Sheet 199 (23,3%)	Sheet 313 (32,7%)	Sheet 374 (37,6%)	Sheet 353 (34,4%)	Sheet 367 (36,2%)
2	Other plastic 107 (20,1%)	Synthetic rope 169 (23,4%)	Synthetic rope 161 (23,3%)	Synthetic rope 175 (20,5%)	Synthetic rope 306 (32,0%)	Synthetic rope 347 (34,8%)	Monofilament fishline 331 (32,3%)	Monofilament fishline 347 (34,2%)
3	Sheet 104 (19,5%)	Monofilament fishline 142 (19,6%)	Monofilament fishline 149 (21,6%)	Monofilament fishline 151 (17,7%)	Monofilament fishline 230 (24,1%)	Other plastic 217 (21,8%)	Synthetic rope 245 (23,9%)	Synthetic rope 286 (28,2%)

4	Monofilament fishline 92 (17,2%)	Bag 114 (15,8%)	Bag 138 (20%)	Bag 132 (15,5%)	Bag 149 (15,6%)	Monofilament fishline 215 (21,6%)	Bag 182 (17,8%)	Bag 141 (13,9%)
5	Bag 67 (12,6%)	Fishline (tangled) 102 (14,1%)	Fishline (tangled) 107 (15,5%)	Other plastic 109 (12,8%)	Other plastic 139 (14,5%)	Bag 131 (13,2%)	Other plastic 146 (14,2%)	Other plastic 139 (13,7%)
6	Fishline (tangled) 58 (10,9%)	Other plastic 96 (13,3%)	Other plastic 96 (13,9%)	Fishline (tangled) 101 (11,8%)	Fishline (tangled) 128 (13,4%)	Fishline (tangled) 116 (11,6%)	Fishline (tangled) 106 (10,3%)	Fishline (tangled) 137 (13,5%)
7	Wood (processed) 45 (8,4%)	Fishing net 50 (6,9%)	Fishing net 60 (8,7%)	Band 51 (6,0%)	Clothing 53 (5,5%)	Fishing net 63 (6,3%)	Clothing 55 (5,4%)	Wood (processed) 67 (6,6%)
8	Rope 40 (7,5%)	Wood (processed) 41 (5,7%)	Rope 35 (5,1%)	Wood (processed) 42 (4,9%)	Wood (processed) 49 (5,1%)	Other rubber 49 (4,9%)	Fishing net 50 (4,9%)	Other rubber 55 (5,4%)
9	Fishing net 37 (6,9%)	Rope 37 (5,1%)	Clothing 30 (4,3%)	Fishing net 41 (4,8%)	Other rubber 45 (4,7%)	Clothing 48 (4,8%)	Other rubber 49 (4,8%)	Clothing 55 (5,4%)
10	Other plastic 30 (5,6%)	Clothing 35 (4,8%)	Wood (processed) 29 (4,2%)	Clothing 41 (4,8%)	Gloves 44 (4,6%)	Cans (drink) 38 (3,8%)	Rope 48 (4,7%)	Band 46 (4,5%)

Table 2: Celtic Seas Top 10 for Occurrences. The frequency of occurrence and the probabilities (as percentages) are also provided using the total number of hauls as denominators. Total number of hauls were: 361 in 2012, 396 in 2013, 373 in 2013, 332 in 2015, 624 in 2016, 533 in 2017, 632 in 2018 and 610 in 2019. Plastic items are shaded grey.

	2012	2013	2014	2015	2016	2017	2018	2019
1	Synthetic rope 56 (15,5%)	Synthetic rope 71 (17,9%)	Bag 61 (16,4%)	Synthetic rope 53 (16,0%)	Synthetic rope 83 (13,3%)	Sheet 91 (17,1%)	Sheet 153 (24,2%)	Synthetic rope 149 (24,4%)
2	Crates 24 (6,6%)	Monofilament fishline 47 (12,6%)	Synthetic rope 50 (13,4%)	Bag 27 (8,1%)	Sheet 61 (9,8%)	Synthetic rope 55 (10,3%)	Synthetic rope 130 (20,6%)	Monofilament fishline 133 (21,8%)
3	Caps 23 (6,4%)	Bag 41 (10,4%)	Sheet 49 (13,1%)	Monofilament fishline	Monofilament fishline	Band 46 (8,6%)	Monofilament fishline	Sheet

				27 (8,1%)	60 (9,6%)		109 (17,2%)	109 (17,9%)
4	Fishing net 22 (6,1%)	Caps 38 (9,6%)	Monofilament fishline 48 (12,9%)	Sheet 26 (7,8%)	Bag 58 (9,3%)	Caps 43 (8,1%)	Bag 78 (12,3%)	Bag 80 (13,1%)
5	Monofilament fishline 18 (5,0%)	Crates 36 (9,1%)	Fishline (tangled) 32 (8,6%)	Other plastic 21 (6,3%)	Caps 36 (5,8%)	Monofilament fishline 42 (7,9%)	Other plastic 67 (10,6%)	Fishing net 48 (7,9%)
6	Rope 16 (4,4%)	Sheet 30 (7,6%)	Fishing net 25 (6,7%)	Rope 16 (4,8%)	Band 36 (5,8%)	Other plastic 28 (5,3%)	Fishing net 35 (5,5%)	Other plastic 42 (6,9%)
7	Bag 15 (4,2%)	Band 22 (5,6%)	Other plastic 22 (5,9%)	Fishline (tangled) 12 (3,6%)	Other plastic 30 (4,8%)	Bag 27 (5,1%)	Plastic bottles 33 (5,2%)	Plastic bottles 28 (4,6%)
8	Other plastic (2,5%)	Fishing net 19 (4,8%)	Plastic bottles 13 (3,5%)	Fishing net 11 (3,3%)	Plastic bottles 22 (3,5%)	Fishing net 22 (4,1%)	Fishline (tangled) 30 (4,7%)	Fishline (tangled) 22 (3,6%)
9	Sheet 8 (2,2%)	Plastic bottles 15 (3,8%)	Rope 9 (2,4%)	Plastic bottles 8 (2,4%)	Fishing net 21 (3,4%)	Fishline (tangled) 21 (3,9%)	Cans (drink) 27 (4,3%)	Clothing 16 (2,6%)
10	Fishline (tangled) 8 (2,2%)	Cable ties 14 (3,5%)	Cans (drink) 8 (2,1%)	Caps 7 (2,1)	Fishline (tangled) 19 (3,0%)	Plastic bottles 18 (3,4%)	Clothing 26 (4,1%)	Cans (drink) 15 (2,5%)

Table 3: Bay of Biscay and Iberian Coast Top 10 for Occurrences. The frequency of occurrence and probabilities (as percentages) are also provided using the total number of hauls as denominators. Total number of hauls were: 163 in 2012, 251 in 2013, 252 in 2014, 286 in 2015, 266 in 2016, 217 in 2017, 270 in 2018 and 199 in 2019. Plastic items are shaded grey. Note that the frequency for Synthetic rope in 2014 is very low in comparison to other years.

	2012	2013	2014	2015	2016	2017	2018	2019
1	Bag 44 (27,0%)	Synthetic rope 46 (18,3%)	Rope 55 (21,8%)	Synthetic rope 104 (36,4%)	Synthetic rope 111 (41,7%)	Sheet 87 (40,1%)	Synthetic rope 144 (53,3%)	Sheet 92 (46,2%)
2	Synthetic rope 38 (23,3%)	Rope 46 (18,3%)	Fishline (tangle)	Sheet 65 (22,7%)	Sheet 61 (22,9%)	Synthetic rope	Sheet 108 (40,0%)	Synthetic rope

			d) 54 (21,4%)			80 (36,9%)		92 (46,2%)
3	Monofilament fishline 29 (17,8%)	Monofilament fishline 43 (17,1%)	Sheet 36 (14,3%)	Bag 47 (16,4%)	Monofilament fishline 54 (20,3%)	Monofilament fishline 63 (29,0%)	Monofilament fishline 94 (34,8%)	Monofilament fishline 85 (42,7%)
4	Rope 21 (12,9%)	Sheet 35 (19,9%)	Fishing net 35 (13,9%)	Monofilament fishline 40 (14,0%)	Bag 39 (14,7%)	Bag 56 (25,8%)	Bag 59 (21,9%)	Bag 45 (22,6%)
5	Fishing net 19 (11,7%)	Metal 24 (9,6%)	Bag 26 (10,3%)	Fishline (tangled) 31 (10,8%)	Fishline (tangled) 23 (8,6%)	Cans (drink) 26 (12,0%)	Other metal 35 (13,0%)	Fishline (tangled) 23 (11,6%)
6	Sheet 18 (11,0%)	Natural 21 (8,4%)	Metal 22 (8,7%)	Fishing net 21 (7,3%)	Other plastic 23 (8,6%)	Plastic bottles 23 (5,6%)	Other natural 33 (12,2%)	Cans (drink) 20 (10,1%)
7	Plastic bottles 17 (10,4%)	Glass 18 (7,2%)	Other plastic 18 (7,1%)	Cans (drink) 17 (5,9%)	Fishing net 22 (8,3%)	Other plastic 21 (9,7%)	Clothing 32 (11,9%)	Other plastic 17 (8,5%)
8	Metal 16 (9,8%)	Crates 16 (6,4%)	Plastic bottles 15 (6,0%)	Other plastic 15 (5,2%)	Plastic bottles 15 (5,6%)	Clothing 21 (9,7%)	Cans (drink) 27 (10,0%)	Fishing net 14 (7,0%)
9	Wood (processed) 12 (7,4%)	Bag 14 (5,6%)	Glass 14 (5,6%)	Plastic bottles 14 (4,9%)	Clothing 13 (4,9%)	Other metal 17 (7,8%)	Fishline (tangled) 26 (9,6%)	Clothing 13 (6,5%)
10	Other plastic 11 (6,7%)	Fishing net 12 (4,8%)	Synthetic rope 10 (4,0%)	Clothing 11 (3,8%)	Cans (drink) 11 (4,1%)	Fishing net 16 (7,4%)	Fishing net 23 (8,5%)	Band 10 (5,0%)

Table 4: Top 10 lists for all years (2012 to 2019) combined, by OSPAR Region. The frequency of occurrence and probabilities (as a percentages) are also provided using the total number of hauls as denominators. Total number of hauls were: 6789 in the Greater North Sea, 3861 in the Celtic Seas and 1904 in the Bay of Biscay and Iberian Coast hauls. Items shaded grey are plastic.

	Greater North Sea	Celtic Seas	Bay of Biscay and Iberian Coast
1	Sheet 2146 (31,6%)	Synthetic rope 647 (16,8%)	Synthetic rope 625 (32,8%)
2	Synthetic rope 1802 (26,5%)	Sheet 527 (13,6%)	Sheet 502 (26,4%)
3	Monofilament fishline 1657 (24,4%)	Monofilament fishline 484 (12,5%)	Monofilament fishline 417 (21,9%)
4	Bag 1054 (15,5%)	Bag 387 (10,0%)	Bag 330 (17,3%)
5	Other plastic 1049 (15,4%)	Other plastic 222 (5,7%)	Fishline (tangled) 178 (9,3%)
6	Fishline (tangled) 855 (12,5%)	Fishing net 203 (5,3%)	Fishing net 162 (8,5%)
7	Fishing net 380 (5,6%)	Caps 151 (3,9%)	Rope 138 (7,2%)
8	Clothing 346 (5,1%)	Fishline (tangled) 148 (3,8%)	Other plastic 129 (6,8%)
9	Wood (processed) 326 (4,8%)	Plastic bottles 143 (3,7%)	Plastic bottles 113 (5,9%)
10	Rope 301 (4,4%)	Band 140 (3,6%)	Cans (drink) 112 (5,9%)

In the Greater North Sea seven out of the top ten items were plastic and five were related to fishing activities, in the Celtic Seas all the top ten items were plastic and four were related to fishing activities, in the Bay of Biscay and Iberian Coast eight of the top ten items were plastic and five were related to fishing activities. Plastic bags were the fourth top item in the three areas, and plastic bottles were the ninth top item in both Celtic Seas and Bay of Biscay and Iberian Coast, but not included in the top 10 for Greater North Sea.