Beach litter

Scottish Government
Riaghaltas na h-Alba
gov.scot

Key message

Marine litter on beaches continues to be a problem in many areas, with the amount of litter being highest in Firth of Forth harbours and lowest in Orkney. Sanitary items are increasing in the Clyde and in Firth of Forth harbours. However, the abundance of plastic bags and plastic bottles is decreasing in all areas assessed.

Torry beach after storm Frank

Background

The amount of litter in the earth's seas has increased substantially over recent decades and is of international concern. Litter appears in the sea and on beaches. This litter originates from human activities at sea and on land, with fishing, shipping, sewage outputs and the public all being major sources. Of particular concern are persistent plastics, which may float, remain in suspension, sink to the sea-floor, be cast up on beaches or be ingested by marine life. The predominant type of marine litter is plastic and polystyrene of various types, with a higher percentage of plastics and polystyrene in beach and floating litter as opposed to seabed litter. Plastic litter will take hundreds of years to degrade and therefore will accumulate in the environment. Litter can harm marine creatures, has economic consequences, and is a risk to human safety.

Figure 1.
Beach litter on Torry beach, Aberdeen, after storm Frank.

The density and type of litter found on beaches has been recorded by the Marine Conservation Society (MCS) since 1993. The Great British Beach Clean survey takes place annually (third weekend in September) and relies on volunteers to select and survey a beach. In addition, OSPAR reference beaches (Cramond and Kinghorn Harbour (Forth), Lunderston Bay (Clyde) and Mill Bay (Orkney)) are surveyed 4 times per year by MCS volunteers and staff. All these surveys use a standard method, agreed with OSPAR, to count the visible pieces of plastic and non-plastic litter on a beach, with these being put into one of 118 different categories. These 118 categorises were grouped to give the Scottish Beach Litter Performance

For further information on this topic go to: https://marine.gov.scot/sma/assessment/BeachLitter

Indicators (SBLPI) and both the OSPAR reference beach data and MCS data (2008-2017) are assessed by coastal sub-regions. The coastal sub-regions used were based on oceanographic processes that influence the deposition of beach litter.

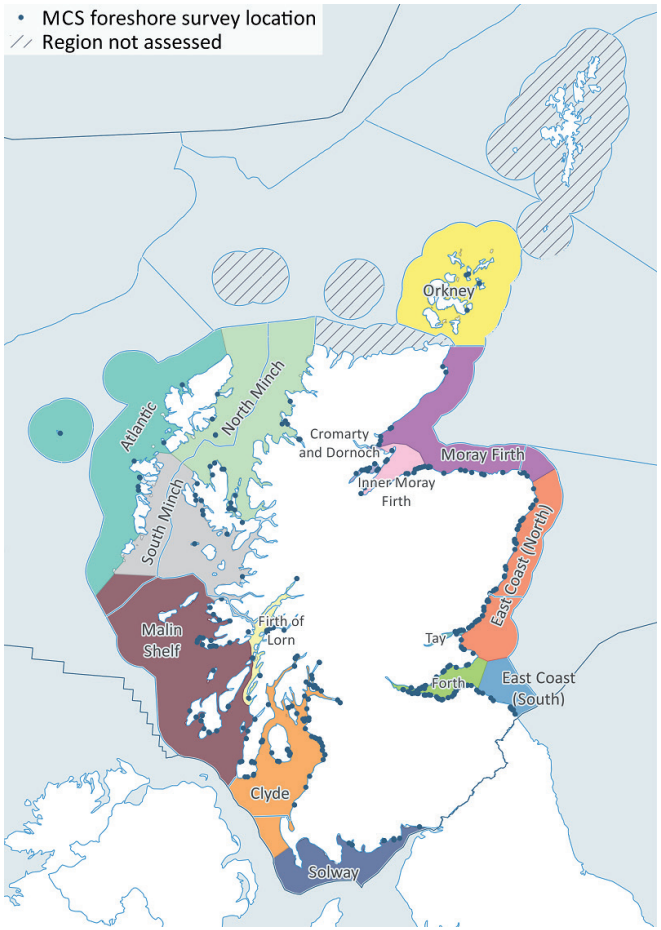


Figure 2:
Map showing location of all Marine Conservation Society (MCS) foreshore surveys (point symbols), arranged in 15 sub-regions (indicated by different colours). There were sufficient data for an assessment of the Clyde, Orkney, Moray Firth, East Coast (North) and Forth (including Forth harbours).

Results

The composition of beach litter in the five sub-regions is shown in Figure 3, and the trends over the last decade shown in Table 1 for the Priority One categories.

Harbours in the Firth of Forth have the highest total litter loading of any sub-region where SBLPIs have been calculated. They also have the highest proportion of sanitary items (nearly 50%), and this proportion is increasing at the fastest rate of any SBLPIs. All categories associated with industries are increasing.

The Clyde sub-region has the second highest average beach litter loading. The proportion of the total litter loading that is made up of sanitary items is the highest. The Clyde has the highest number of pilot SBLPIs showing increasing trends, particularly within sanitary items and those related to angling, fishing and shipping.

Orkney had the lowest average beach litter loadings. This may reveal the true “background” litter conditions in Scottish waters before other effects enhance litter concentrations. Local sources of non-plastic litter items are so low (i.e. wood, paper, cloth, glass, metal, sanitary and medical items) that plastic makes up by far the greatest proportion of Orkney’s beach litter, probably most originating outwith Orkney. Overall, beaches were relatively clean, with an overall improving trend.

Although indicators for the Moray Firth have been calculated, several years are missing owing to too few surveys being available. In general, most categories are showing decreasing trends, apart from those related to the marine industries of shipping and fishing, which are showing gradual increasing trends.

Apart from indicators associated with wet wipes, angling and smoking, most other categories suggest improving beach conditions in the East Coast (North). For some indicators, however, this may be partly caused by very high values estimated from 2008 surveys.

As with the Clyde, the Firth of Forth has a high proportion of sanitary items. However, the total beach litter loadings are not particularly high. This is most likely due to the effect of wind, tides and currents along the Scottish east coast. In general, apart from those associated with wet wipes and smoking waste, all pilot SBLPIs in the Firth of Forth are suggestive of static or improving litter conditions.

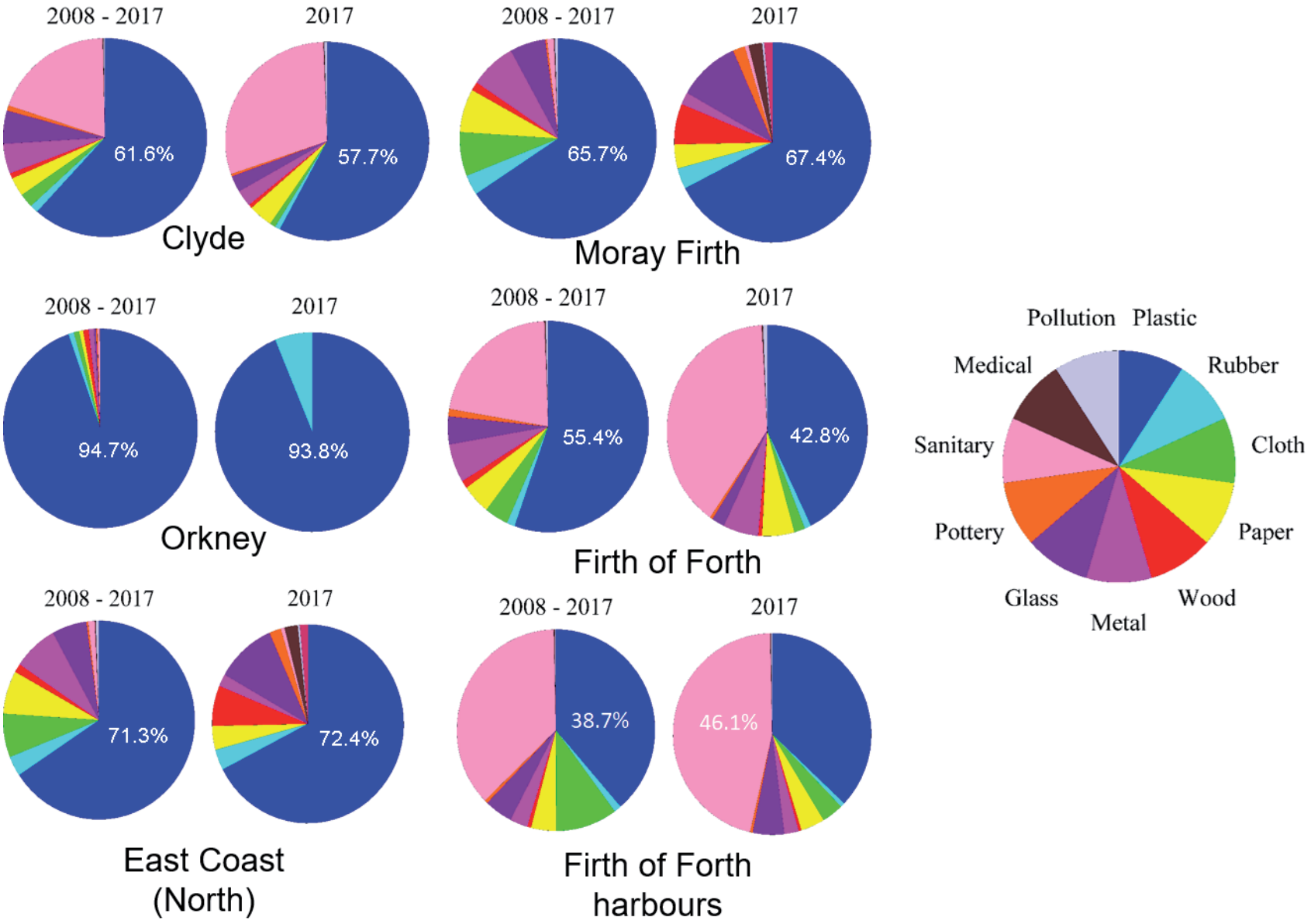


Figure 3:

Composition of beach litter in the five Scottish sub-regions (and Firth of Forth harbours) with sufficient data, averaged for 2008 to 2017, and with 2017 also shown separately.

Table 1:
Summary of changes in number of pieces of litter (np)/100 m over the last decade for the Priority One Indicators in the five regions (as well as for Firth of Forth Harbours) with sufficient data. The greater the number, positive/negative, the greater the increase/decrease in litter The annual average for np/100 m over the 10 years (2008 – 2017) is also shown.

Type	SBLI	Clyde	Orkney	Moray Firth	East Coast (North)	Forth	Forth (harbours)
Individual Items	Plastic – Bottles*	-1.5	-1.9	-1.9	-2	-1.8	-1.1
	Plastic – Shopping Bags*	-2.5	-1.2	-1.9	-1.6	-1.6	0.1
	Plastic – Straws*	1.1	RARE	-1.5	-1.9	-0.9	-2.9
	Sanitary – Cotton Buds	1.7	RARE	-1.6	-1.2	-1.5	0.5
	Sanitary – Wet Wipes	2.7	RARE	0.7	2.2	1.9	+2.9
	Paper – Coffee Cups*	0.6	RARE	-1.8	-0.6	0.7	-0.7
Totals	All Plastic	0.1	-1.5	0.2	-1.6	-0.9	-1.4
	All Sanitary	2	RARE	-0.4	-0.7	0.3	3
	All Litter	0.6	-1.5	-1	-1.5	-0.1	1.2
Average Total Litter Loading (np/100 m)		***670***	***40***	***320***	***250***	***341***	***1,600***
	Increasing by 2 or more standard deviations per decade		Increasing or decreasing by 0 to 1 standard deviations per decade			Decreasing by 1 or more standard deviations per decade	

"Indicators marked by an asterisk can include additional (but similar) litter items as well as the target item owing to the nature of the MCS survey recording protocols. np/100 m = number of litter items per 100 m survey transect."

Conclusion

Indicators of beach litter in Scotland reveal the general features around the coast arising from public littering, other land-based sources and marine-based sources. These indicators provide a context for management actions and strategy formulation.

The amount of litter was lowest in Orkney and highest in Forth (harbours). Total plastics showed significant decreases in Orkney, East Coast (North) and Forth (harbours), with plastic bags and plastic bottles decreasing in all areas assessed. The total amount of litter in Firth of Forth harbours was approximately five times higher than elsewhere. The proportion of sanitary items in the Clyde and Forth is (about ten times) higher than elsewhere, increasing in the Clyde and in Firth of Forth harbours. Wet wipes are increasing in the Clyde, Forth and East Coast North. Angling related debris is increasing on East Coast North. Smoking related debris is increasing on beaches on the East Coast North and in the Forth.

Knowledge gaps

Few beaches in remote areas are monitored for beach litter, particularly on the west and north coasts. In addition there are no data for Shetland. Beach litter surveys are infrequent surveys and therefore fail to describe average conditions well.

Status and trend assessment

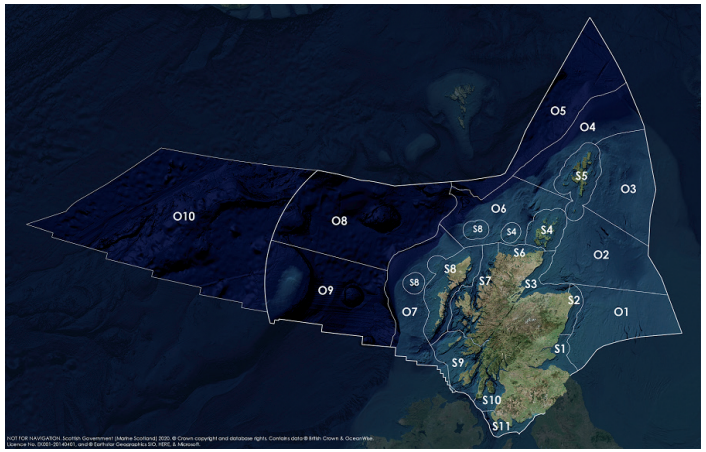
Region assessed	Status with confidence	Trend with confidence
Clyde		
Orkney		
Moray Firth		
East Coast (North)		
Forth (including Forth harbours)		

Status and trend assessment legend

Status assessment (for Clean and safe, Healthy and biologically diverse assessments)		Trend assessment (for Clean and safe, Healthy and biologically diverse and Productive assessments)	
	Many concerns		No / little change
	Some concerns		Increasing
	Few or no concerns		Decreasing
	Few or no concerns, but some local concerns		No trend discernible
	Few or no concerns, but many local concerns		All trends
	Some concerns, but many local concerns	**Confidence assessment**	
	Lack of evidence / robust assessment criteria	**Symbol**	**Confidence rating**
	Lack of regional evidence / robust assessment criteria, but no or few concerns for some local areas		Low
	Lack of regional evidence / robust assessment criteria, but some concerns for some local areas		Medium
	Lack of regional evidence / robust assessment criteria, but many concerns for some local areas		High

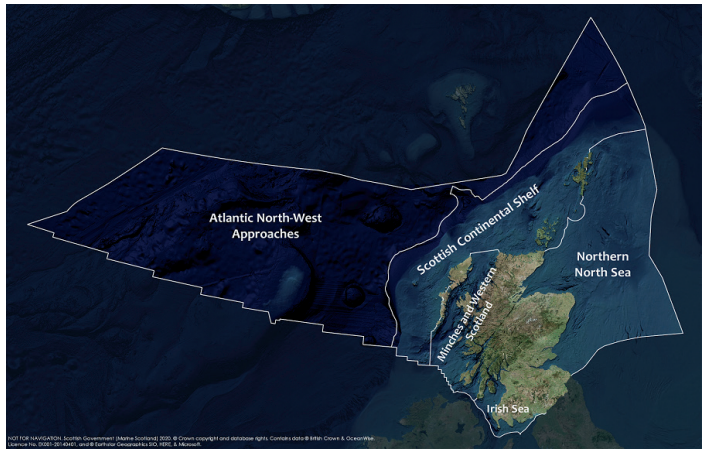
Overal confidence

Assessment regions

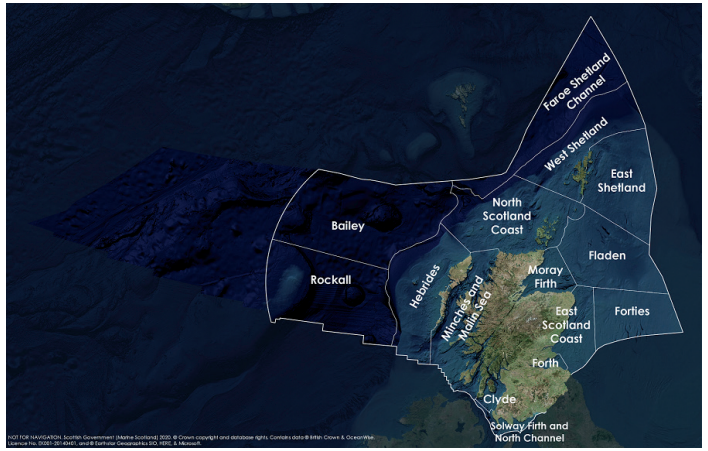


The Scottish Marine Regions (SMRs; S1 – S11) and the Scottish Offshore Marine Regions (OMRs, O1 – O10)

Key: S1, Forth and Tay; S2, North East; S3, Moray Firth; S4 Orkney Islands, S5, Shetland Isles; S6, North Coast; S7, West Highlands; S8, Outer Hebrides; S9, Argyll; S10, Clyde; S11, Solway; O1, Long Forties, O2, Fladen and Moray Firth Offshore; O3, East Shetland Shelf; O4, North and West Shetland Shelf; O5, Faroe-Shetland Channel; O6, North Scotland Shelf; O7, Hebrides Shelf; O8, Bailey; O9, Rockall; O10, Hatton.



Biogeographic, Charting Progress 2 (CP2) Regions. These have been used as the assessment areas for hazardous substances.



Scottish Sea Areas as used in Scotland's Marine Atlas 2011. These are sub divisions of the biogeographic, or Charting Progress 2 (CP2), Regions.

Scottish Government
Riaghaltas na h-Alba
gov.scot

marinescotland

NatureScot
Scotland's Nature Agency
Buidheann Nàdair na h-Alba

JNCC
Joint Nature Conservation Committee

SEPA
Scottish Environment Protection Agency

This material was published on the Scottish Marine Assessment 2020 portal, December 2020