

Beach litter Monitoring Project Report

Berwickshire and North Northumberland Coast

2007



Funded by Leader+ Northumberland and Scottish Borders



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Project coordinator

Aisling Lannin - Berwickshire and North Northumberland coast European Marine Site Implementation Officer - ALannin@northumberland.gov.uk 01670 533 780 www.xbordercurrents.com

Project Organisers

Liza Cole - St Abb's and Eyemouth Volunteer Marine Reserve Ranger LCOLE@nts.org.uk 01890 771 443 www.marine-reserve.co.uk

Iain Robson - Northumberland Coast Area of Outstanding Natural Beauty Access and Recreation officer IAINRobson@northumberland.gov.uk 01670 534 078 www.northumberlandcoastaonb.org

Sue Kinsey - Marine Conservation Society Adopt-A-Beach officer - sue.kinsey@mcsuk.org 01989 567 807 www.mcsuk.org

Calum Duncan - Marine Conservation Society Scottish Officer - scotland@mcsuk.org 0131 226 6360 www.mcsuk.org/mcsaction/scotland

Executive Summary

This project began as an idea to tackle beach litter along the coast of Berwickshire and North Northumberland. Finance was available in the form of EU granted Leader+ cross border project funding. Bids were successful and a steering group consisting of the St Abb's and Eyemouth Volunteer Marine reserve (VMR) ranger, Area of Outstanding Natural Beauty (AONB) access and recreation officer, Scottish projects officer for the Marine Conservation Society (MCS), Adopt-A-Beach officer for MCS and the European Marine Site (EMS) officer in the coordinating role was formed. Three workshops led by the MCS were organised, two in Northumberland and one in Berwickshire. Volunteer groups for most of the beaches within the EMS were formed. The groups carried out seasonal beach cleans and surveys on their local beaches and supplied the data to MCS for analysis. At the end of the project the analysis was compiled in a report written by the Adopt-A-Beach officer and the EMS officer and presented to the volunteers and wider community at an awareness raising event held in Tweedmouth on December 15th 2007. The attendees had a chance to see the results and develop ideas for awareness materials and further targeted anti-beach litter campaigns. The production of awareness materials followed and the promotion of the report and results was carried on whenever the opportunity arose. The volunteers continue to clean their beaches and supply important data to MCS and it is hoped that in time the litter on the beaches will be reduced due to increased awareness and duty of care to the environment and ourselves.

1. Introduction

Marine and coastal litter from tourists and recreational users of the coast, fishing vessels, ships, offshore facilities, recreational boats, rivers and sewage outfalls is an issue of growing concern for environmentalists, the public, local and national government. Litter on beaches is unsightly and creates a drain on local authority budgets for clean up operations, whilst litter at sea harms wildlife, damages equipment and spoils fish catches. The growing use of non-biodegradable plastics as a packaging material has been shown to result in the accumulation of plastic in the beach and marine environment. Of particular concern is the potential for the breakdown products from plastic items into microscopic plastic pieces which can adsorb hazardous chemicals on their surfaces and the subsequent ingestion of these by marine life.

A range of measures are needed to reduce litter from these sources including: improved facilities at coastal sites and ports; extension and enforcement of anti-pollution laws on land and at sea; education of all sectors (tourists, domestic householders, shipping and fishing industry); incentives for manufacturers to reduce the amount of plastics used in packaging.

Marine litter is a problem that affects even the world's most remote beaches and the magnificent coastline of the Berwickshire and North Northumberland Coast European Marine Site (EMS) is sadly no exception. While marine wildlife pays the highest price for this problem, marine litter also negatively affects tourism and local businesses that benefit from coastal visitors.

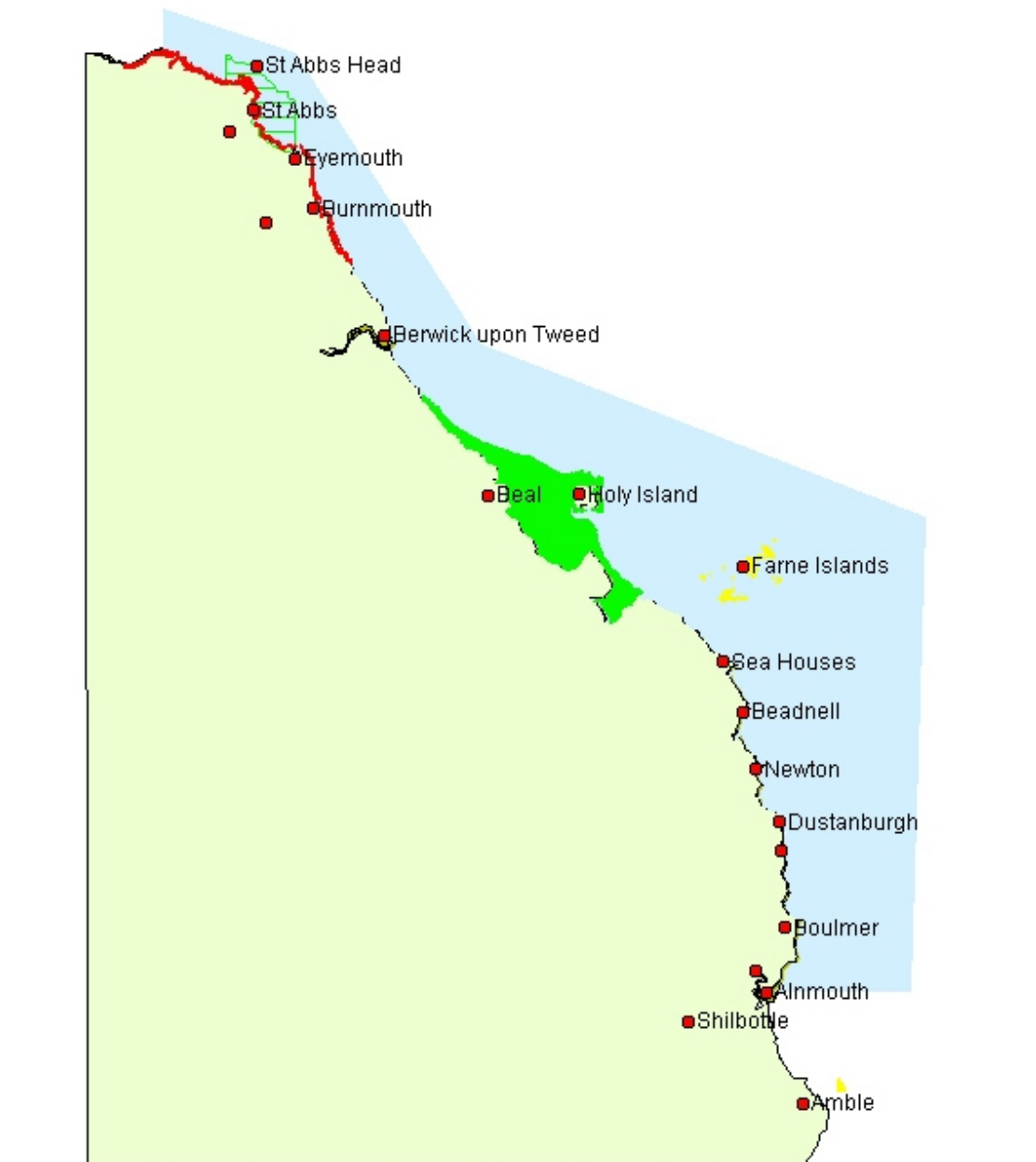
2. The Leader+ Project

This community-based project focused on encouraging public participation in beach litter surveys and cleans. The project aimed to:

- Raise awareness of the issues surrounding beach litter; its management and impacts.
- Lead to greater community participation in marine conservation.
- Identify the main sources of litter with the aim of reducing litter at source.

Of particular interest for this project was the assessment of the sources, types and amount of litter within the voluntary marine reserve area in St Abbs and Eyemouth Voluntary Marine Reserve (VMR) in comparison to other sites within the EMS. The VMR, established in 1984, is voluntary and relies on the goodwill of people to abide by a Code of Practice, which includes restricted intensive fishing activities and encouragement of more sustainable traditional fishing practices. The EMS is a site designated in 1996 under the Habitats and Birds Directives for its features of special conservation interest, including rocky reefs, sea caves, sand and mud flats, shallow inlets and bays, grey seals and birds of the Lindisfarne Special Protected Area (SPA). The site extends from Fast Castle Head in Berwickshire north of the VMR to Alnmouth in Northumberland (Figure 1). Competent and relevant authorities have some responsibilities in terms of litter on the coast but in general there is not an awareness raising campaign within the EMS that informs people about how litter ends up on beaches and in the sea and what damage it does once it gets there.

Figure 1 Map of the Berwickshire and North Northumberland Coast European Marine Site showing the St Abb's and Eyemouth Volunteer Marine Reserve in hatched green in the northern part of the site.



3. Project Initiation.

Initially volunteers were canvassed along the coast for each of the main beaches within the EMS and VMR. There was a great response from the community and three day long workshops led by the Marine Conservation Society (MCS); two in Northumberland and one in Scotland were organised. During the workshops, as well as carrying out a beach clean, participants were given information on:

- Litter in the marine environment - its effects and costs
- Health and safety on beach cleans
- Recruiting volunteers
- Identifying different types of litter
- Dealing with the media
- The protocols and methodology used for beach surveys

A network of community-driven beach cleaning initiatives was established with volunteering opportunities for both local people and visitors.

Working with the MCS, the VMR ranger, AONB access and recreation officer and the EMS officer, regular marine litter surveys were then undertaken by local volunteers on several beaches within the EMS, following the standardised protocol. The surveys identified the main material types and items of rubbish and their source on the local beaches.

The information collected forms part of the nationwide Adopt-a-Beach surveys co-ordinated by the MCS. This data allows MCS to tackle the sources of marine litter at local, national and international levels.

During the project a total of 44 beach clean/surveys were carried out at 19 beaches. 522 single volunteer efforts accumulating 1836.5 volunteer hours went into completing the 44 events. Seven surveys were carried out during the winter

period (Jan, Feb and Dec), 9 during the spring (March - May), 8 during summer (June - August) and 20 during autumn (September - November). Within the VMR 14 surveys took place, 3 each in winter and summer, four in spring and five in winter. In the rest of the EMS five cleans were conducted in each of winter, spring and summer and fifteen in the autumn.

In general there are usually more cleans in the autumn period as the MCS Beachwatch survey, which coincides with the international beach clean weekend, falls within this period. Beachwatch is a national and international event that occurs annually in the third weekend of September. As many beaches as possible are surveyed at this time to be analysed as one hub of information and presented to the UK government as a report of the state of the beaches on the coast of the UK. This information is accrued annually and is producing a very good picture of the change in beach litter over time and in different areas. The Beachwatch report is used by the government to inform their policies on litter.

The effect of legislation aimed at reducing litter inputs to the aquatic environment has often been limited due to delays in effective implementation and difficulties of enforcement. Public participation in the Beachwatch project and other community initiatives plays an important role in increasing general understanding of the litter issue. Such schemes enable people to become actively involved in practical measures to reduce marine litter, and raise awareness of the need to prevent coastal pollution.

Beachwatch also provides data for the International Coastal Cleanup, coordinated by the Ocean Conservancy (formerly the Centre for Marine Conservation) in the USA, which involves over 70 countries worldwide in litter surveys and beach cleans over the same weekend in September, providing information on the global extent of marine litter.

The information gathered by the volunteers of this Beach litter monitoring project and analysed by MCS has been used to inform the creation of awareness materials. The report provides the basis for our targeted campaign against beach litter while our volunteers and the community have a chance to add their ideas to the creation of the most effective beach litter awareness materials.

The funding for the project has come jointly from Leader+ Scottish Borders and Leader+ Northumberland and was provided for work carried out in the calendar year of 2007.

Members of the volunteer group working at Budle Bay



Members of the volunteer group from University of Northumbria working at Beadnell



4. Results

4.1. The summary results are given below. The beaches are listed in appendix 1.

All Beaches	
total number of cleans	44
total number of beaches	19
metres surveyed	>19,741
volunteer hours	1836.5
volunteers	522
total weight	>1,235 kg
total items	>16,142
Items/km	>817

VMR Beaches	
total number of cleans	15
total number of beaches	5
metres surveyed	>1550
volunteer hours	566
volunteers	185
total weight	>270.6 kg
total items	>6424
Items/km	>4284

Outside VMR Beaches	
total number of cleans	29
total number of beaches	14
metres surveyed	>18191
volunteer hours	1270.5
volunteers	337
total weight	>964.4
total items	>9718
Items/km	>534

UK average items/km in 2006 = 1,988

NE average items/km in 2006 = 1620

The most surprising result is that the items/km appear to be higher within the VMR than outside, however this may be due to the fact that proportionally more km/beach were surveyed in the VMR i.e. more are per beach was cleared of litter. Due to time constraints for production of this report the total weight and items of every clean could not be included therefore the eventual total will be greater than the figures listed here.

4.2. Top ten litter items

As can be seen by looking at the lists below most of the top ten items with the exception of glass, cloth, paper pieces and cans are made of, or contain plastic. The presence at the top of every table of small plastic pieces highlights the persistence of plastics in the marine environment. These plastic pieces are formed from the breakdown of other plastic products.

UK results				
Position 2005	Position 2006	Item	% of Total Litter	Items/km
1	1	Plastic pieces 1cm - 50cm	13.2	262.5
5	2	Cotton bud sticks	8.6	172.0
2	3	Plastic pieces < 1cm	6.2	122.8
3	4	Crisp/sweet/lolly wrappers	5.6	110.9
8	5	Polystyrene pieces	5.5	108.6
4	6	Plastic caps / lids	5.4	108.4
7	7	Rope	4.3	85.3
10	8	Cigarette stubs	4.2	84.1
9	9	Plastic drinks bottles	3.9	76.7
6	10	Fishing net < 50cm	3.3	65.4

The results from the project area generally reflect the national picture (below).

All Beaches in the study area			
Position	Item	% of total litter	Items/km
1	Plastic Pieces 1- 50 cm	14.35	117.02
2	Fishing line from anglers	8.23	67.12
3	Plastic rope	6.05	49.34
4	Crisps Sweet, lolly wrappers	5.85	47.73
5	Cigarette stubs	5.75	46.87
6	Plastic Pieces Size < 1 cm	4.69	38.23
7	Polystyrene pieces < 50cm	4.66	38.03
8	Glass pieces	4.03	32.88
9	Cloth pieces string	3.88	31.67
10	Plastic drinks bottles	3.27	26.67

Interestingly one of the main differences between the UK results and the results from the study area is that cotton bud sticks were not as large a

problem in the region as they are nationally. This is good news and indicates we do not need to focus a lot of our attention on making people aware of the persistence of cotton buds in the environment. The other main difference is the prevalence of fishing and angling related litter on the Berwickshire and Northumberland shores as can be seen in the tables below.

Beaches inside the VMR			
Position	Item	% of items in VMR	Items/km
1	Plastic pieces 1- 50 cm	20.23	838.71
2	Fishing line from anglers	9.09	376.77
3	Plastic rope	8.28	343.23
4	Crisps, sweet, lolly wrappers	5.87	243.23
5	Fishing net < 50cm	5.28	218.71
6	Polystyrene pieces < 50cm	4.68	194.19
7	Cloth pieces/string	3.86	160.00
8	Plastic caps and lids	3.44	142.58
9	Drink cans	3.13	129.68
10	Cigarette stubs	3.10	128.39

The rest of the EMS			
Position	Item	% items outside VMR	Items/km
1	Plastic pieces 1- 50 cm	10.47	55.88
2	Fishing line from anglers	7.67	40.93
3	Cigarette stubs	7.50	40.05
4	Plastic pieces < 1 cm	6.33	33.79
5	Glass pieces	6.06	32.36
6	Crisps, sweet, lolly wrappers	5.84	31.21
7	Polystyrene pieces < 50cm	4.65	24.84
8	Plastic rope	4.58	24.45
9	Paper pieces	4.13	22.03
10	Cloth pieces/string	3.90	20.82

Cigarette stubs are a nuisance nationally but also appear to be a high priority target for an awareness campaign in the EMS but not as high a priority in the VMR. This result will allow us to hone our campaigns.

Members of the Berwick Wildlife Group at Little Beach



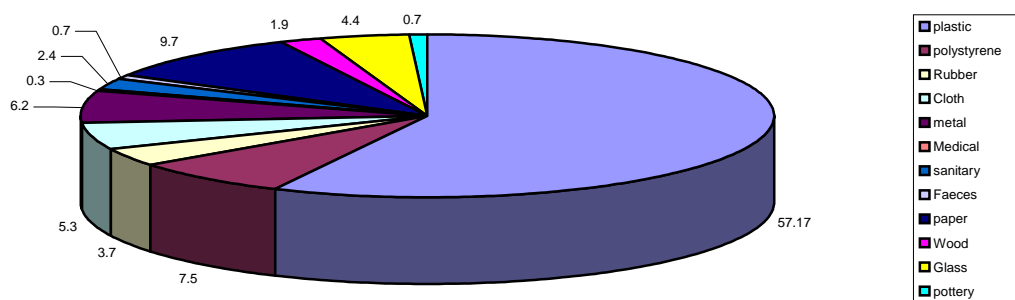
Members of the scout troop doing their bit at Spittal



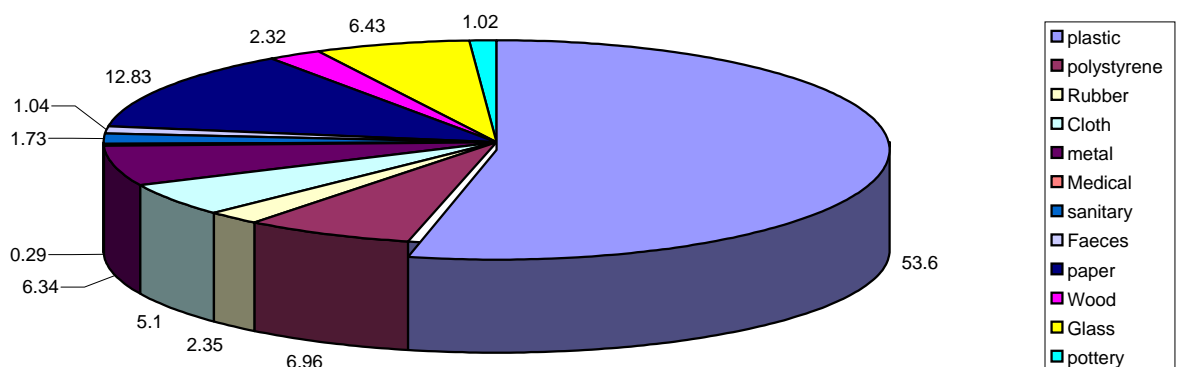
4.3. Litter by material type

The density of each material type (plastic, polystyrene, metal, paper etc) found during the project is shown below graphically and also listed in appendix 2. As in the rest of the UK, plastic is the most common litter material found on all beaches. It should be noted that most items of sewage related debris (SRD) are also either entirely or partially made of plastic, and polystyrene can also be considered a form of plastic. **This means that the overall percentage of beach litter caused by persistent plastics is over 60%.**

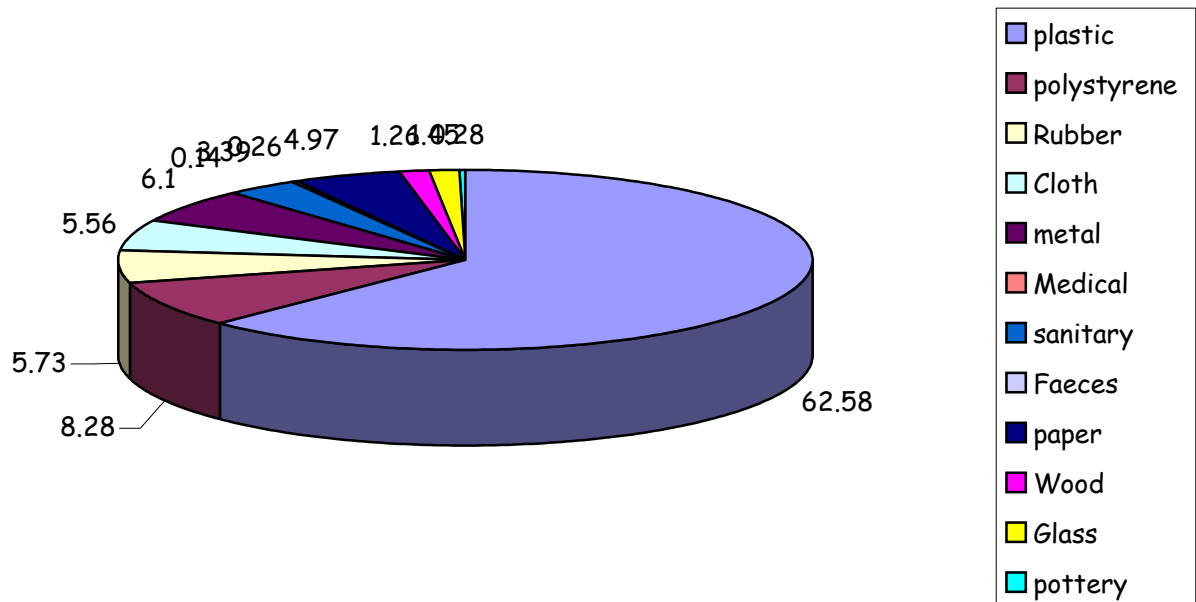
Litter percentages by material on all project beaches



Litter percentages by material outside VMR



Litter percentages by material in VMR



4.4 Sources of Litter

Identifying the source of litter items can be a complex task, as litter may reach a beach in a number of ways. For example, a beach visitor may leave behind a plastic bag on the beach, or it may be thrown over the side of a passenger ship, or be blown by wind from land or dropped in the street, washed down the drain and carried downstream via a river. The sources of other items are more easily identified, and may be attributed with a high level of confidence to one of six specific sources: beach visitors; fishing; sewage related debris; shipping; fly-tipped; or medical.

Beach visitors' litter includes items such as crisp, sweet and lolly wrappers, plastic drink bottles, cigarette stubs, ice lolly sticks, glass bottles and drinks

cans, which may have been dropped directly on the beach or dropped elsewhere and washed in on the tide.

Items originating from the fishing industry (including commercial and recreational angling), such as fishing line, rope, net, buoys, floats and weights, are perhaps some of the most straightforward items to source.

Sewage related items, such as cotton bud sticks, tampons, tampon applicators and towels/panty liners can be sourced with confidence since the vast majority of these items have originated from the sewerage system.

Litter from shipping includes oil drums, aerosol cans, crates, pallets and strapping bands. Reports from MCS Beachwatch organisers in certain remote locations, such as Shetland, suggest that some items usually categorised as 'non-sourced' or 'beach visitors' should be attributed to shipping debris. Therefore, shipping litter probably accounts for a higher proportion of overall litter in some regions, compared to national figures.

There is always a large proportion of litter that cannot be sourced confidently. These items remain not sourced, because sourcing them would only be a 'best-guess', or because they are completely unidentifiable. Pieces of plastic, rubber and cloth etc, rarely provide clues about their original source and continue to represent a significant proportion of the total litter recorded.

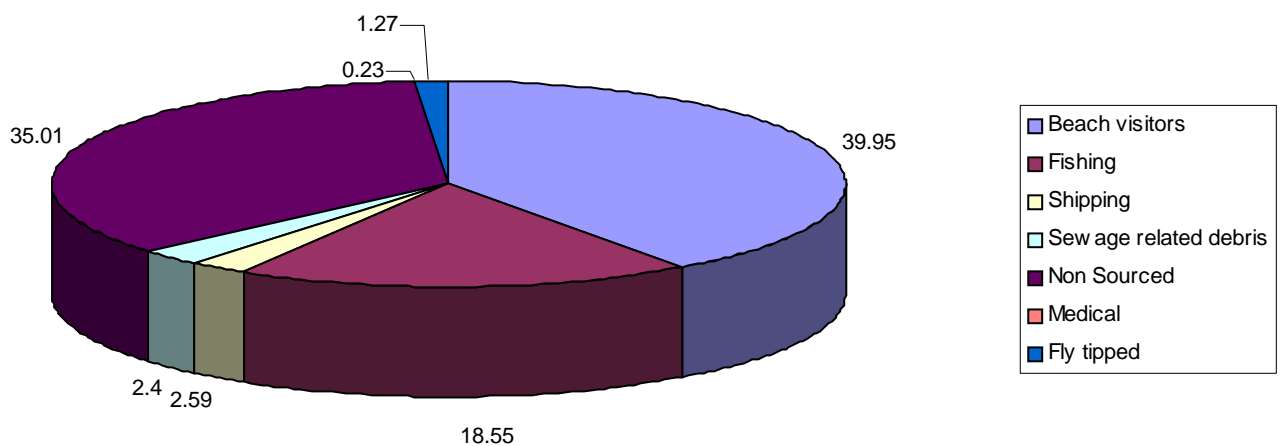
Fly-tipping usually accounts for a small proportion of litter recorded in Beachwatch surveys, and includes items such as industrial scrap, tyres and furnishings, however, many of these items are large and can have a significant aesthetic impact.

Medical litter is generally a small category but does contain some of the most hazardous items found on beaches in the form of syringes and medicines.

For all beaches surveyed in this project visitor litter was the highest category (raw data is listed in appendix three). Tourist and recreational litter has consistently been the most common source of beach litter both on a national scale and within regions during MCS beach surveys.

A large proportion of plastic found in the environment is also due to beach users, as a result of items such as drinks bottles, crisp and sweet wrappers, and bottle caps and lids being thrown away.

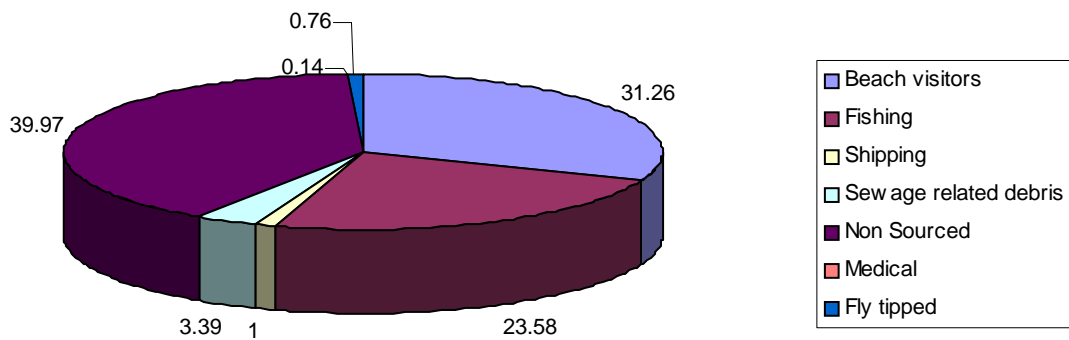
Litter percentages on all beaches by source



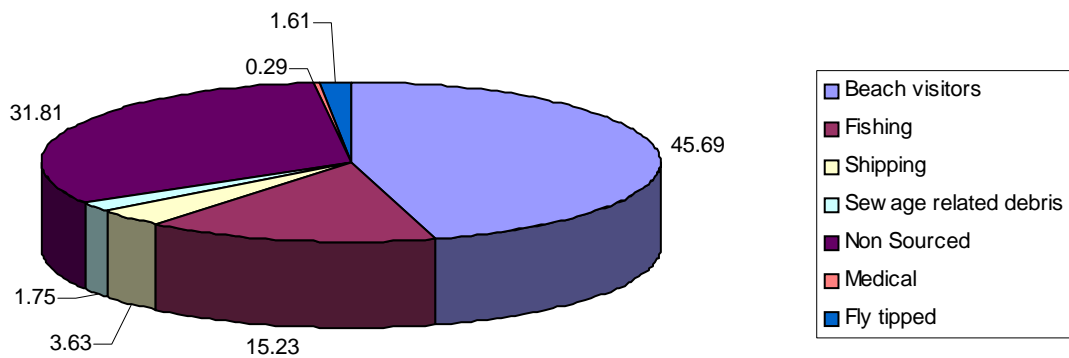
Interestingly within the VMR the percentage of visitor litter fell and there was an increase in fishing litter compared to all beaches. As stated previously fishing

litter is probably underestimated and so may actually make up a larger proportion of litter on most beaches.

Litter percentages by source in VMR



Litter percentage by source outside VMR



Members of the volunteer group at Beadnell demonstrating teamwork

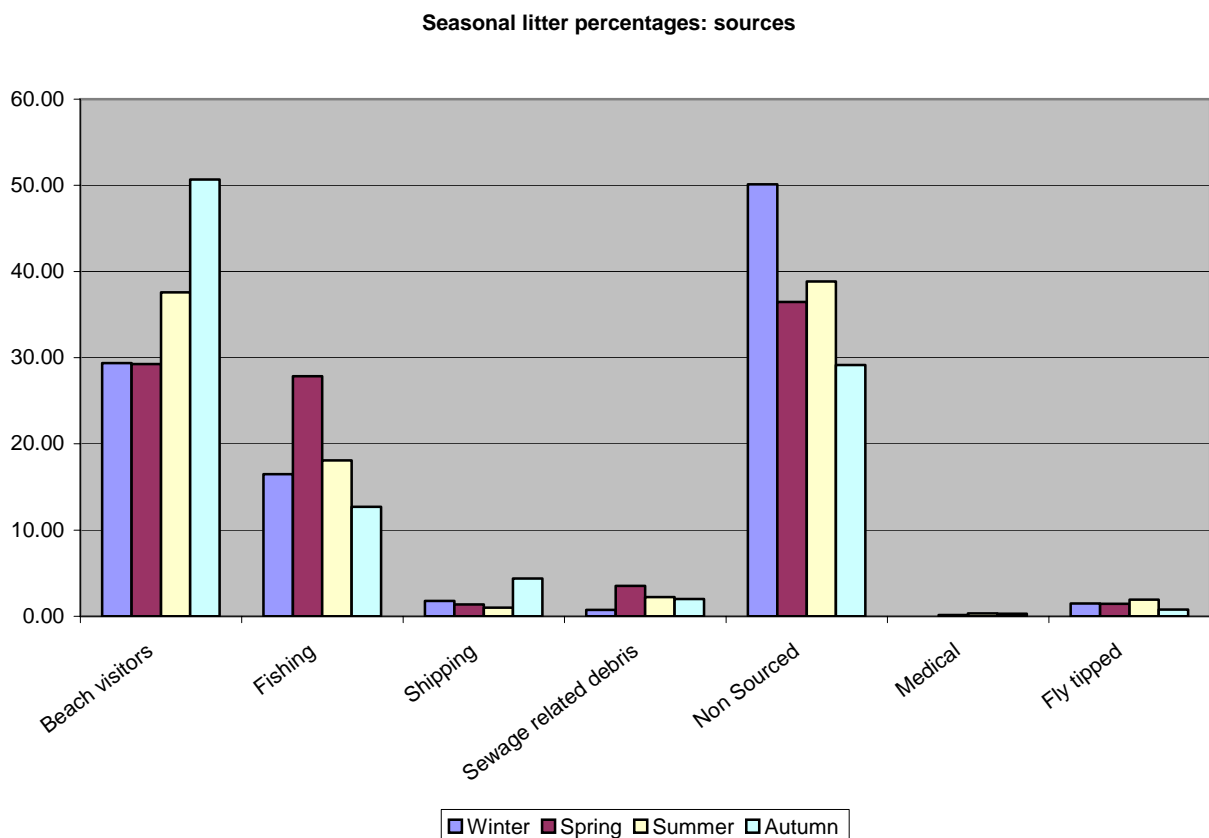


The AONB coastal rangers after their beach clean and survey at Seahouses



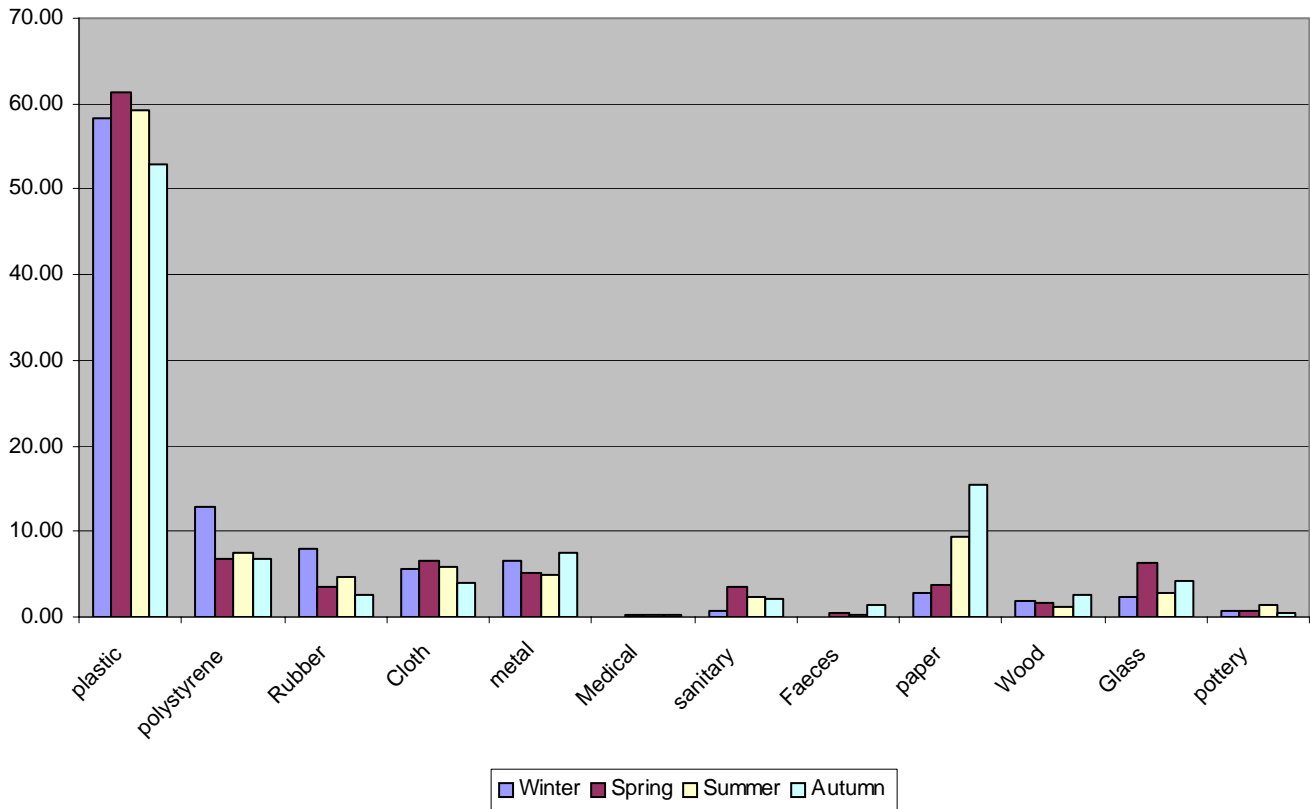
4.5 Seasonal data

Part of the remit of this project was to conduct beach surveys in each of the seasons on each of the beaches to assess if there were any seasonal effects that should be taken into account when trying to tackle the sources of beach litter. The results show the sources of beach litter found in 2007 during this project do not have a particular seasonal trend. The main types of beach litter that are highlighted in the previous results are shown in high numbers in each of the seasons. It appears that the focus of awareness materials must be on all year around and not in one particular season.



Therefore it is important to target visitor litter and fishing related litter. It is also possible that non sourced litter is actually visitor litter that has been in the environment for a length of time that makes it difficult to source. As in the general summary results plastic is by far the most prevalent item of beach litter found on the beaches and must be the main target of awareness raising campaigns (see graph below).

Seasonal litter percentages



In terms of unusual items (listed in appendix four) the largest items were lobster pots and creels. This is understandable given that the main inshore fishery in the area is for lobster and the volunteer marine reserve promotes the use of creels as a more sustainable method of fishing. A particularly regional occurrence was a large cache of golf balls. This problem could probably be targeted by raising awareness at the golf club. The other items including a survival suit and used cable ties are more items that add further to the need for a general campaign of awareness raising. The project also highlighted the variety of dead birds that are found on beaches.

5. Discussion

The most notable aspect of this project is the exceptionally committed work of the volunteer groups that have been clearing litter from their local beaches and filling out the survey sheets to make a fantastic contribution to the national

project managed by the Marine Conservation Society. It is their hard work and the commitment of MCS that makes this information available in a useful way. The EU funding provided by Leader+ Northumberland and Leader+ Scottish Borders has added value to the hard work of the volunteers, organisers and MCS by providing the means to take the information collected and create targeted awareness materials for the Berwickshire and North Northumberland Coast European Marine Site, St Abb's and Eyemouth Volunteer Marine Reserve and the North Northumberland Coast Area of Outstanding Natural Beauty.

Of course the end of this project does not mean the end of the beach cleans and surveys. Although we wish our project could eradicate beach litter forever this is sadly not a realistic view. Instead we will do our best to promote awareness of beach litter with the materials that we have produced and the volunteers and MCS will continue to carry out their hard and committed work. Hopefully the message will spread and the amount of litter finding its way to the beaches will decrease either by local efforts or by international efforts to stem the litter brought to beaches from other shores by the tides.

Members of the University of Northumbria volunteer group at Beadnell



A very well suited and booted member of the volunteer group at Spittal



Appendices

1. List of beaches

Killidraughts, Limkin, Coldingham, Eyemouth - within the VMR and EMS
Burnmouth, Little Beach, Pier road beach, Spittal, Cheswick, Budle Bay, Farne Islands, Seahouses, Beadnell, Newton Point, Sugar Sands, Seaton Point, Alnmouth, Amble, Druridge Bay - within the EMS only

2. Litter by material

All beaches		
	%	Items/km
plastic	57.17	467.5
polystyrene	7.5	61.19
Rubber	3.7	30.19
Cloth	5.3	43.21
metal	6.2	51.06
Medical	0.3	1.87
sanitary	2.4	19.55
Faeces	0.7	5.98
paper	9.7	79.33

VMR		
	%	Items/km
plastic	62.58	2593.55
polystyrene	8.28	343.23
Rubber	5.73	237.42
Cloth	5.56	230.32
metal	6.1	252.92
Medical	0.14	5.81
sanitary	3.39	140.65
Faeces	0.26	10.97
paper	4.97	205.81

Outside VMR		
	%	Items/km
plastic	53.6	286.21
polystyrene	6.96	37.14
Rubber	2.35	12.53
Cloth	5.1	27.25
metal	6.34	33.85
Medical	0.29	1.54
sanitary	1.73	9.23
Faeces	1.04	5.55
paper	12.83	68.52

3. Litter by Source

All Beaches	%	items/km
Beach visitors	39.95	326.48
Fishing	18.55	151.65
Shipping	2.59	10.38
Sewage related	2.4	1.87
Non Sourced	35.01	286.18
Medical	0.23	21.16
Fly tipped	1.27	19.59

VMR	%	items/km
Beach visitors	31.26	1295.48
Fishing	23.58	977.42
Shipping	1	31.61
Sewage related	3.39	5.81
Non Sourced	39.97	1652.26
Medical	0.14	41.29
Fly tipped	0.76	140.65

Outside VMR	%	items/km
Beach visitors	45.69	243.96
Fishing	15.23	81.32
Shipping	3.63	8.57
Sewage related	1.75	1.54
Non Sourced	31.81	169.84
Medical	0.29	19.40
Fly tipped	1.61	9.34

North East average for 2006

The North East had the lowest density of fishing and shipping litter, and all densities were well below both the England and UK averages. Beach visitors' litter was the largest source of litter in the North East with 666.3 items/km surveyed. The second largest source was fishing debris (110.9/km), followed by SRD (92.4/km) and shipping (29.4/km).

4. Unusual items

All items found outside the VMR

Lobster pot cage and about 40m of 2cm rope
30 golf balls!
Towing hook, rod, bandage, towel, sunglasses
plastic fish box also collected with half a bag of rubbish
6 tyres, survival suit
100's of plastic used cable ties, Dr. Collins labels, Car Arial, half a water butt, plastic fender, engine filter
babies dummy
4x destroyed lobster creels, 2x vehicle tyres, 1x vehicle starter motor.
5.5kg piece of metal could be part of household appliance, possibly used as BBQ rack. Much of rest of rubbish on beach around fire site - large untidy bbq party
2 lengths of electrical cable wrap, 1 x wood pallet
Lack of cotton bud sticks
190 pieces of glass, some sea-worn, about half freshly broken

5. Dead/injured animals

Within VMR

1 herring gull, 1 guillemot, 1 kittiwake - all dead
2 dead birds - guillemot, razorbill
Dead birds: fulmar, guillemot (nothing unusual). No apparent cause of death.
1 dead gannet
1 dead shag

Rest of the EMS

1 dead guillemot
2 gulls
2 seagulls, 2 gannets (?). Cause of death unknown
1 seagull, 1 gannet
1 dead chicken (animals usually float down the river Coquet, we occasionally get dogs and sheep)
1 male eider duck, cause of death not obvious.
1 rook, cause of death not obvious