Firth of Clyde

Coastal Litter Management Guidelines for Duty Bodies

Prepared by
Fiona Mills
Firth of Clyde Forum
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What is Marine Litter?

Marine litter (marine debris) is any persistent, manufactured or processed solid material discarded, disposed of, abandoned or lost in the marine and coastal environment[1]. This also includes such items entering the marine environment via rivers, sewage outlets, storm water outlets or winds.

What is Coastal Cleaning?

Coastal cleaning is any activity undertaken to remove marine litter from the coastal area (beaches, rocky shores, salt marshes and tidal flats). This can be by mechanical methods such as a tractor pulled beach cleaning machine with raking and/or sifting techniques or by handpicking of litter.

What is a Beach Management Strategy?

A beach management strategy includes policies on various aspects of maintaining the beach and surrounding areas in good condition for visitors. This can include car parking, toilet facilities, bins and recycling, access arrangements, health and safety, water quality, interpretation panels, dog walking and other recreational activities. These coastal litter management guidelines can be used to develop a Litter Management Plan which can be included as part of the overall Beach Management Strategy.

Abbreviations and Acronyms

COP	Code of Practice on Litter and Refuse (Scotland) 2006, which accompanies the EPA2
EPA	Environmental Protection Act 1990
GES	Good Environmental Status (under the MSFD)
INNS	Invasive Non-Native Species
MSP	Marine Spatial Plan
MCA	Maritime and Coastguard Agency
MCS	Marine Conservation Society
MPA	Marine Protected Area
MSFD	Marine Strategy Framework Directive
SAC	Special Area of Conservation
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SSMEI	Scottish Sustainable Marine Environment Initiative
SSSI	Site of Special Scientific Interest
UMBSM	University Marine Biological Station Millport

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[1] UNEP Regional Seas Programme (2005): Marine Litter – an analytical overview
[2] www.littercode.org

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THE BENEFITS OF A COASTAL LITTER MANAGEMENT PLAN

There are many benefits for the Duty Body, the general public and local businesses as a result of developing and implementing an effective Coastal Litter Management Plan. These include:

- Improvement in the aesthetic value of a local coastline helps to attract visitors and improves the quality of life of local communities.
- Removal of litter reduces the chance of accidents from cut glass, syringes or entanglement (eg by divers off the coast).
- Removal of litter reduces the cost to local businesses such as fisheries, shipping and aquaculture.
- Efficient allocation of staff resources through a clear management plan saves time and money.
- Clear objectives, area prioritisation and focus improve staff morale.
- Leaving the strandline in place (by eliminating mechanical cleaning) ensures that healthy ecosystems thrive, increasing biodiversity and providing food resources for many wading and terrestrial birds.
- Leaving the strandline in place (by eliminating mechanical cleaning) and not removing any pioneer species enables sand dunes and salt marshes to form, improving coastal defence and increasing biodiversity.
- The assignment of reference beaches for data collection ensures that the effectiveness of initiatives to reduce marine litter inputs can be measured and allows for monitoring under the European Marine Strategy Framework Directive Descriptor 10.
- Increased ownership of the issues by local people and involvement in beach cleaning initiatives helps to raise awareness of the issue and ultimately reduce inputs of litter to the marine environment.

BACKGROUND

The Firth of Clyde Marine Spatial Plan (MSP)[3], developed as part of the Scottish Sustainable Marine Environment Initiative (SSMEI) and completed in 2010, highlighted the need to "develop a coordinated marine litter strategy for the Firth of Clyde". The Firth of Clyde Forum is responsible for implementing the Action Plan from the MSP and as a first step in the development of the marine litter strategy the Forum prepared a status quo report in 2011[4]. Whilst anticipating the development of a National Marine Litter Strategy by Marine Scotland within the next few years, the report identified several actions that could be carried out by the Forum in the meantime, including the development of Coastal Litter Management Guidelines.

INTRODUCTION

These Guidelines are designed to assist Local Authorities and any other Duty Body in the Firth of Clyde area in keeping beaches and shorelines clean and safe whilst ensuring that the natural environment is valued and protected. The Guidelines are not intended to be prescriptive, but instead to be applied as appropriate recognising local circumstances. Their development should not obscure the need to tackle the issue at source and prevent litter being improperly disposed of in the first place. Where appropriate, the Guidelines should be used to develop a Coastal Litter Management Plan which can be used as one of a suite of tools including Water Quality objectives and Health & Safety initiatives to develop a comprehensive Beach Management Strategy. The Guidelines deliberately do not focus on the prevention of marine and coastal litter as this will be covered under a future Regional Marine Litter Strategy.

The Firth of Clyde Forum area stretches from the weir in Glasgow city centre right out to the Irish Sea (see Fig 1 below). As such, it encompasses many types of shoreline including rocky shore, mudflats, marshes and pebble or sandy beaches. The coastal strip plays an important part in the lives of local communities, whether through recreation such as water sports and walking, or commercially for fishing or aquaculture. Many parts of the Firth of Clyde are also frequented by visitors from further afield and can be an important source of tourism revenue for local economies.

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[3] Donnelly JE, Thompson K, Ross D (2010) Scottish Sustainable Marine Environment Initiative : Firth of Clyde Marine Spatial Plan

[4] Marine Litter Strategy for the Firth of Clyde. Step 1: Defining the Status Quo
http://www.clydeforum.com/index.php?option=com_content&view=article&id=63&Itemid=69

Marine Litter, derived from a number of sources, can often gather on our shorelines and beaches brought there by wind, wave, current and tide action. As well as being unsightly, it can have a knock-on effect on the local economy, human health and wildlife:

- visitors can be discouraged from revisiting or recommending an area;
- the fishing and shipping industries can be hampered by propeller fouling, the blocking of intake pipes, damage to equipment and contaminated catch;
- broken glass, sewage related debris, rusting metal and discarded medical waste pose a health risk to beach visitors;
- many types of litter can harm and/or kill wildlife through entanglement or ingestion.

These Guidelines cover the same geographical area as the Firth of Clyde Forum and SSMEI Marine Spatial Plan, namely the marine and tidal extents of the Firth of Clyde including the River Clyde Estuary, the Inner Firth and associated sea lochs and the Outer Firth. The Plan's outer boundary, where the Outer Firth meets the Irish Sea, extends from the tip of the Mull of Kintyre across to Finnarts Point, north of Loch Ryan (Figure 1).



Figure 1: Geographical extent of the Firth of Clyde Coastal Litter Management Guidelines

1. THE CONTEXT

1.1 Marine Litter: The Nature of the Problem

Significant and increasing quantities of marine litter appear in our seas and on our beaches. Litter is unsightly and can cause harm to marine wildlife through entanglement and ingestion, smothering of the seabed and as a platform for invasive species. The presence of sewage-related debris (SRD) also suggests that adjacent waters are contaminated by sewage, which constitutes a health risk to water users. Plastics are the main type of litter found both on beaches and offshore, including increasing quantities of microscopic pieces of plastic resulting from degradation of larger plastic products in the sea.

A report recently commissioned by the Scottish Government found that the approximate economic cost of the marine litter problem in Scotland is **£16.8 million per annum**.[5] However, this figure is underestimated - the economic costs are likely to be much higher as many sectors do not have data on impacts, and there is no research yet on ecosystem services and non-use values such as passing the resource on to the next generation. Keep Scotland Beautiful has estimated that Scottish local authorities alone spend over £100 million every year on cleansing services, with at the last survey (06/07 financial year), at least £100,000 being spent on beach cleaning in just seven local authority areas. Information on the Economic Value of Volunteering from Volunteer Development Scotland indicates that the economic value of volunteers participating at 230 litter picks during National Spring Clean 2012 was in excess of £290,000.

Marine litter originates both from the land and the sea and is often carried on currents from other countries. Results from the Marine Conservation Society's 2011 Beachwatch Big Weekend indicate the following sources of litter:

UK	Scotland	
39.9%	46.5%	Public Items dropped or left by the public on the coast or inland and carried by winds and rivers
38.3%	32.5%	Non-sourced Items too small or damaged to identify or it's not obvious where they have come from
11.4%	6.1%	Fishing Includes commercial and recreational items – eg fishing line, nets, rope, weights and buoys
5.4%	9.4%	Sewage-related debris (SRD) Items flushed down the toilet such as cotton bud sticks, tampons and panty liners
3.6%	3.0%	Shipping Items dropped or lost from ships
1.2%	2.2%	Fly-tipped Illegal disposal of waste including furnishings, pottery and ceramics
0.2%	0.2%	Medical Includes anything medical such as inhalers, plasters, syringes

Source: MCS Beachwatch Big Weekend 2011 Summary Report and methods/results document.

Establishing the actual volumes of litter that are present on our coastline is extremely difficult and levels vary depending on the influence of location, tide, wind and weather. In the OSPAR region, a pilot study published in 2007 found an average of 542 items of marine litter of various sizes per 100-metre survey on the reference beaches[6].

Marine Scotland is currently developing a National Marine Litter Strategy and the Firth of Clyde Forum will develop a Regional Strategy to support this. These Strategies are designed to tackle the issue of marine litter at source and will potentially take many years to impact the amount of litter entering the marine and coastal environment. In the meantime the issue of marine litter will continue to be a problem on our coastlines. Studies[7] and anecdotal evidence suggest that cleaned beaches can

[5] Potts T, Hastings E (2012) Marine Litter Issues, Impacts and Actions,http://www.scotland.gov.uk/Publications/2012/09/6461/0

6 OSPAR Commission. 2007. OSPAR Pilot Project on Monitoring Marine Beach Litter: Final Project report.

[7] Garrity, S. D. and Levings, S. C. (1993) Marine debris along the Caribbean coast of Panama.

become heavily littered again within a matter of weeks. In order to ensure that the public and the environment are protected from the hazards of litter as far as possible and to ensure that our local coastline remains picturesque, shoreline cleaning will continue to be important for the foreseeable future.
For further information on marine litter, please see section 5. Useful Links.

1.2 Policy and Legislation

1.2.1 Environmental Protection Act

The Environmental Protection Act 1990 (EPA)[8] was extended in 2000 to make Duty Bodies responsible for keeping all beaches under their ownership clear of litter and refuse. It also gives both Local Authorities and members of the public rights to take legal action to get areas cleaned up. Duty Bodies are organisations with a legal responsibility for keeping specified public places clear of litter and refuse. These bodies include Local Authorities and statutory undertakers such as landowners, and road and rail operators. They are responsible for making sure that beaches under their control are kept free from litter and refuse as far as is practicably possible and within reason. Both the police and Local Authorities can issue fixed penalty notices to those guilty of the offence of littering under the EPA.
Details for compliance can be found in the Code of Practice on Litter and Refuse (Scotland) 2006, which accompanies Part IV (section 89/7) of the EPA9. The Code of Practice is based on the following two principles:

- Areas which are habitually more heavily trafficked should have accumulations of litter cleared away more quickly than less heavily trafficked areas; and
- Larger accumulations of litter and refuse should be cleared more quickly than smaller accumulations.

1.2.2 Bathing Water Directive

For those beaches which are close to designated bathing waters, a new legal requirement came into effect in 2011 which brings with it extra duties in terms of cleanliness. This comes from the Bathing Waters (Scotland) Regulations 2008, which implement the revised Bathing Water Directive 2006/7/EC. Regulation 16 'Management measures at bathing waters affected by other pollution' came into force on 24 March 2011, and states that remedial or restorative measures must be taken to remove pollution, including tarry residues, glass, plastic, rubber or any waste, if it is seen to present a risk to bathers, within seven days. This part refers to the bathing water area, which for coastal bathing waters is the area of foreshore (i.e. the area between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS) plus a seaward buffer extending from MLWS).

1.2.3 Marine Strategy Framework Directive

Under the EC Marine Strategy Framework Directive (MSFD)[10], the UK Government and Devolved Administrations including the Scottish Government have to meet specific requirements on marine litter under Descriptor 10 to contribute towards achieving Good Environmental Status (GES) for the marine environment by 2020. The table below indicates the proposed GES characteristics and associated targets and indicators for Descriptor 10 and includes targets for the amount of litter on coastlines. It must be stressed that these are currently in draft form and may well be revised following the consultation carried out in June 2012.

Marine Pollution Bulletin, 26(6), 317-324 Williams, A. T. and Tudor, D. T. (2001) Litter burial and exhumation: Spatial and temporal
distribution on a cobble pocket beach. Marine Pollution Bulletin, 42(11), 1031-1039

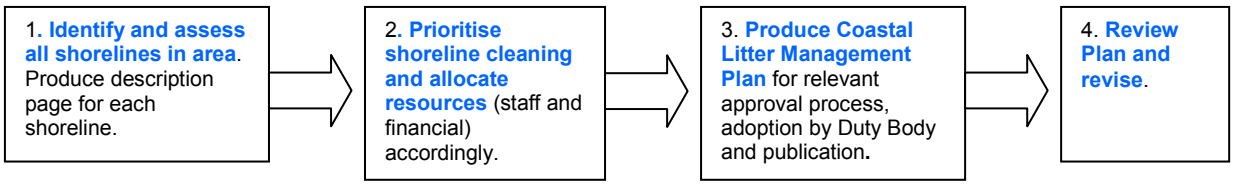
[8] http://www.legislation.gov.uk/ukpga/1990/43/contents
[9] www.littercode.org
[10] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).
http://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm

characteristics of GES for Descriptor 10 (Marine Litter)	• The amount of litter, and its degradation products[173], on coastlines and in the marine environment is reducing over time and levels do not pose a significant risk to the coastal and marine environment, either as a result of direct mortality such as through entanglement, or by way of indirect impacts such as reduced fecundity or bioaccumulation of contaminants within food chains.	
Proposed GES targets and indicators for marine litter (Descriptor 10)		
	OPTION 1	**OPTION 2**
Proposed targets and indicators for Descriptor 10 – *Characteristics of Litter in the Marine Environment*	• Decreasing trend (where litter levels are shown to be rising or unacceptable) in the number of visible litter items within specific categories/types on the coastline from 2010 levels by 2020.	• Overall reduction in the number of visible litter items within specific categories/types on coastlines from 2010 levels by 2020 **(preferred option).**
	• Surveillance indicator to monitor the quantities of litter on the seafloor **(preferred option).**	• Decreasing trend (where litter levels are shown to be rising or unacceptable) in the number of visible litter items within specific categories/types on the seafloor from 2010 levels by 2020.
Proposed targets and indicators for Descriptor 10 – *Impacts of litter on marine life*	• Surveillance indicator to monitor the amounts of plastic found in the contents of fulmars stomachs (in line with the OSPAR Ecological Quality Objective) **(preferred option).**	• Trends in the amounts of plastic found in the stomachs of northern fulmars are moving towards the levels indicated in the OSPAR Ecological Quality Objective.

The legislation included in this section of the guidelines is related directly to litter which has already entered the marine and coastal environment. For further information on legislation relating to marine litter in general, please see http://www.scotland.gov.uk/Publications/2012/09/6461/0 section 5 'Relevant Legislation and Coastal Management Policies'.

2. PROCESS FOR DEVELOPING A COASTAL LITTER MANAGEMENT PLAN

The process below is recommended for the development of a Coastal Litter Management Plan:



See sections below for detailed guidance on each of these steps.

2.1 Identify and assess all shorelines in area.

A description sheet should be produced for each shoreline including the following:

- map, picture
- type of shoreline
- category
- description of use
- environmental considerations
- cleanliness target

Each of these items is considered in detail below.

2.1.1 Type of shoreline

Individual shorelines lend themselves to different cleaning techniques. Indeed marine litter does not tend to accumulate as much on more exposed shorelines due to constant wind and wave action, but often gathers in bays or in areas subject to a prevailing wind. A shoreline may be a combination of more than one type.

Shoreline Type	Potential Cleaning Techniques
Exposed rocky headland	Unlikely that litter will accumulate
Eroding wave-cut platform	Unlikely that litter will accumulate
Sandy beach	Mechanical, handpicking or combination
Exposed tidal flat	Handpicking, mechanical if large accumulations and accessible
Mixed sand and pebble beach	Handpicking, mechanical or combination
Pebble beach	Handpicking
Sheltered rocky coast	Handpicking
Sheltered tidal flat	Handpicking, mechanical if large accumulations and accessible
Salt marsh	Handpicking. Mechanical probably impractical

It should be stressed that the general trend is away from the use of mechanical cleaning due to issues highlighted in the environmental section below.

2.1.2 Category

The Code of Practice on Litter and Refuse (Scotland) 2006, which accompanies Part IV (section 89) of the Environment Protection Act EPA Code of Practice guidelines, gives the following suggested categories:

- Amenity beaches – beach adjoining an identified bathing water.
- Recreation beaches – managed beach, seaside award beach, beach adjoining SEPA sampled waters.
- Sensitive Conservation Areas Beaches (eg designated area, see 2.2.4 below).
- Other Beaches – Other beaches and shoreline adjoining public roads.

In addition to this it is worth considering which beaches may serve as ‘Reference’ beaches for data gathering, see section 4. Data and Monitoring below.

Beach Awards

Keep Scotland Beautiful co-ordinates two beach award schemes to recognise some of the best managed beaches: the international Blue Flag and the Seaside Award. Duty Bodies should take into account criteria for litter and cleansing that are included in guidelines if they wish to apply for awards for certain beaches. For Award criteria visit the KSB website[11].

2.1.3 Description of use

A more detailed description of use may well be useful, particularly when looking at initiatives to reduce the input of litter – see table below. Any initiatives to be undertaken such as provision of bins and signage or working with local retailers should be detailed in the individual beach description pages and summarised as part of the Coastal Litter Management Plan document (see section 2.3 below).

Use	When	Issues	Initiatives
Sunbathing/picnic	Summer	Large amounts of domestic-type debris	Regularly serviced bins, recycling where possible. Anti-litter/ reduce-reuse-recycle/information about sources of marine litter. 'Leave only footprints' message. Interpretation panels about importance of natural asset. Fines.
Dog walking	All year round	Fouling and 'poop' bags left behind,	Regularly serviced bins and anti dog fouling signs. Fines.
Close to waste water overflow	All year round	Sewage related debris	Engage with Scottish Water to ensure optimal investment in local waste water facilities if particularly problematic. Communicate 'Bag It Bin It' to local community.
Close to urban area	All year round	Multiple uses by urban population and proximity to shops/takeaways can lead to large amounts of public litter including cans, bottles, bags and sometimes syringes.	Regularly serviced bins, recycling where possible. Anti-litter/ reduce-reuse-recycle/information about sources of marine litter. Fines. Encouragement of 'Food on the Go' code of practice for beach outlets, kiosks and coastal retailers.[12]
Marine recreation point of access	Mainly spring/summer	Increase in general litter and unwanted equipment.	'Leave only footprints' message. Consider including area for cleansing if regular issue. Install bins near moorings.
Education – school/university visits	Spring through to Autumn	Unlikely but could leave litter behind.	Brief group beforehand with 'leave only footprints' message.
Fly Tipping	All year round	Can be large quantity and/or large individual items difficult to remove. Can pollute land and waterways.	Signs, fines see image below. www. dumbdumpers.org stopline number 08452 30 40 90. Height barriers or close off the road (using Road Traffic Act). Do not leave bins in these areas.

[11] http://coastal.keepscotlandbeautiful.org/

[12] Keep Britain Tidy voluntary code of practice for reducing litter caused by Food on the Go http://kb.keepbritaintidy.org/fotg/publications/minicop.pdf and http://kb.keepbritaintidy.org/gum/publications/vcop.pdf



Signs in Argyll & Bute to tackle fly tipping. © Fiona Mills

2.1.3.1 Bins and recycling

In order to encourage visitors to properly dispose of their litter, it is important to have well-sited and frequently serviced bins. Recycling bins should be provided that have lids or a sealing mechanism of some sort so that litter will not be blown out or accessed by birds and mammals. It is important to clearly indicate which bin takes which type of recyclable waste, eg paper/card, plastic, glass etc. It may not be appropriate to site bins in more rural locations.

Where possible and appropriate in more urban areas or car parks it may be useful to signpost the location of the nearest bin. In areas near communities or frequently used by dog walkers, it is advisable to securely label the bin with a bin reference number and contact number so that the general public can report any issues and the bin location can be easily identified.

Frequency of servicing should take into account location, general usage and season.

Bins should be sited taking into account the landscape/seascape of the local area to ensure that the aesthetic value of the coastline is not compromised.

The Zero Waste Plan launched by the Scottish Government in 2010 contains a vision whereby all waste is viewed as a resource. With this is mind, wherever possible Duty Bodies should identify and support opportunities for recycling and reuse of coastal and maritime sources of litter.

2.1.4 Environmental considerations

Any Coastal Litter Management Plan should be developed in consultation with the local Biodiversity or Greenspace Officer or with the environmental department depending on the structure of the relevant Duty Body.

2.1.4.1 Designated Areas

Certain shorelines within the Firth of Clyde fall within areas which have been designated as conservation areas under one of several national and international laws. These include Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA) and in the future may include Special Areas of Conservation (SAC) and Marine Protected Areas (MPA). When considering any shoreline cleaning method, disturbance to the feature or features for which that area has been designated must be avoided. If in doubt as to any issue affecting a designated site, contact Scottish Natural Heritage for guidance (see section 5. Useful Links).

The EC Bathing Water Directive is concerned with the overall quality of bathing waters where there are a large number of people expected to bathe. In Scotland there are currently 83 sites and they can be found by visiting http://www.sepa.org.uk/water/bathing_waters/sampling_and_results.aspx. Most bathing waters will be sampled 20 times during the summer bathing season to check that levels of certain harmful bacteria are within the guidelines. For further information contact Scottish Environment Protection Agency (see section 5. Useful Links).

2.1.4.2 The Importance of the strandline

Strandlines are created by the accumulation of organic matter around the high water mark on beaches and often consist of seaweed, carrion and other organic material. Whilst some may feel they spoil a beach, they are in fact an extremely important part of a healthy beach ecosystem, providing food for a wide variety of creatures and stability for the sand, and linking marine and terrestrial ecosystems. The functions of the strandline are as follows:

- They provide habitat and food for small crustaceans such as sand-hoppers which recycle nutrients from dead and decaying material back into the beach ecosystem;
- Small crustaceans and flies from the strandline act as a direct food source for beetles, spiders, fish and birds, both seabirds and terrestrial species;
- They can be the first stage in the formation of coastal sand dunes or salt marshes which are important for coastal protection against erosion and flooding.

Unfortunately strandlines are often cluttered with marine litter, also brought in with the wind and tide. Occasionally the accumulation of seaweed can reach nuisance levels especially as it starts to degrade and therefore a balance must be achieved in trying to meet the needs of people, both local and visitors, and the needs of wildlife. For the reasons indicated above, whenever beach cleaning has to occur, it is recommended that authorities only use mechanical cleaning as a last resort and consider the following options:

- On those beaches with minimal visitor numbers and certainly in designated areas, consider hand picking only.
- On those beaches with large visitor numbers, and only during the summer season, consider clearing only small sections of the strandline to form "strandline islands" and allow bathers easier access from the top of the beach to the sea. Any seaweed collected should be composted.
- On those beaches where large accumulations of seaweed are causing a public nuisance, the seaweed can be collected and composted but should not go to landfill unless contaminated with hazardous waste.
- Where seaweed is heavily contaminated with litter, the seaweed can be collected and composted at a SEPA registered site – raking should allow the separation of plastics.

It is also essential to publicise the ecological importance of the strandline to both visitors and the local community, including interpretation panels at appropriate locations so that they can appreciate the Beach Management Strategy, particularly if there is a change in beach cleaning methods from mechanical to hand cleaning.

2.1.4.3 Vegetation

If vegetation has encroached on popular areas of the shoreline, the species should be assessed in terms of any adverse effect on the public or the environment, eg if it is poisonous or an Invasive Non-Native Species (INNS). These species should be eradicated by the best available method. For poisonous species the plants should be removed and composted. For INNS, consult the GB non-native species secretariat at www.nonnativespecies.org. Duty Bodies should be aware of the Wildlife and Natural Environment (Scotland) Act 2011 in relation to the new regime for regulating INNS.

Particular care should be taken near sand dunes as the removal of any pioneer species, such as sea rocket and sea stock which grow in front of the dunes, prevents them establishing roots and stabilising the dune structures.

In the case of other species it may be that they are important habitats or sources of food for wildlife. Information about the importance of these species should be included on interpretation panels where appropriate.

2.1.4.4 Nesting Birds

All birds, their nests and eggs are protected under the Wildlife & Countryside Act 1981 and therefore any cleaning activities should ensure that nesting birds are not disturbed in any way.
These guidelines should help to avoid disturbance:

- If birds are flying around repeatedly over the same area and calling anxiously, then move away. Be careful to watch where you put your feet in case you have inadvertently entered a breeding colony.
- If birds are calling repeatedly in an agitated fashion move far enough away from them so that they can settle down again.
- Alert others in your party if you are aware that they may be disturbing breeding birds.

Other wild animals and plants are also protected – see JNCC website for a list of protected species http://jncc.defra.gov.uk/page-1377.

2.1.4.5 Balloons and Chinese lanterns

Once balloons and Chinese lanterns that have been released fall back to earth or the sea they can be mistaken for food items by marine species and livestock. Ingesting these items can cause internal injuries or death following blockage of the stomach. Some organisations such as the Marine Conservation Society and the National Farmer's Union want to see the releasing of balloons and Chinese lanterns recognised as a form of littering under the Environmental Protection Act and banned. Local Authorities can support these campaigns by banning all such releases on their land, and many of them have already done this.

2.1.5 Cleanliness Target

Cleanliness grades have been identified in the Code of Practice on Litter and Refuse (Scotland) 2006, which accompanies Part IV (section 89) of the Environment Protection Act. These grades can be used to establish a target for cleanliness (see below) and how quickly an area should be returned to a Grade A level. Most people regard Grades C and D to be unacceptable. The overall aim should be to operate a management system where acceptable standards of cleanliness (Grades A and B) are maintained at all times.

Grade A	No litter or refuse
Grade B	Predominantly free of litter and refuse – apart form small items
Grade C	Widespread distribution of litter and refuse with minor accumulations
Grade D	Heavily littered with significant accumulations

Examples of cleanliness levels can be seen in photographs included in the Keep Scotland Beautiful publication 'Litter & Scottish Beaches. A guide for the public & practitioners' available at http://coastal.keepscotlandbeautiful.org/documents/litter-scottish-beaches.pdf.

The Code of Practice recommends that beaches are allocated a target timescale to return beaches to the target grade, based on beach type and time of year. The table below is an example given by Keep Scotland Beautiful of how these targets could be represented in a Coastal Litter Management Plan.

Grade/Cleanliness Standard

	A	B	C	D	
Amenity Beach			48 hrs		1st Jun -15th Sept
		←	4 wks		16th Sept- 31st May
Recreational Beach			1 wk		1st Jun- 15th Sept
		←	4 wks		16th Sept-31st May
Sensitive Conservation Area					Monthly hand picking of litter
		←			
Other Beach					As Necessary
		←			

Source: Keep Scotland Beautiful: Litter & Scottish Beaches. A guide for the public & practitioners

2.2 Prioritise shoreline cleaning and allocate resources

It is worth prioritising certain shorelines based on whether they are amenity/recreation beaches and where there are litter problem hotspots so that resources can be efficiently allocated. Other beaches can be cleaned on an ad hoc basis when notified by the public of a problem or following weather events.

2.2.1 Staff resources

Once the different shorelines in the area have been assessed and categorised and objectives have been set at an area level, staff resources can be allocated. The following points need to be considered:

- Shoreline cleaning needs to be carried out during daylight hours 7 days a week. As such, it is necessary to have a flexible work force. It is advisable to employ staff on a '4 days on, 3 days off' basis from April through to the end of September so that they can be active from early morning until evening and also operate over the weekend and national holidays when shoreline use can often be at a peak. It may also be necessary to employ seasonal staff to cover the peak summer months.

- Extreme weather events can cause unusually large amounts of litter to accumulate in coastal areas. A plan should be in place for staff to survey the coastline following such an event and prioritise clean-up areas involving other departments of the Local Authority or liaising with volunteer groups as appropriate.

- All staff should be familiar with the Coastal Litter Management Plan and trained so that they can deal with any issue encountered during surveys and site visits (see further guidelines below for an inexhaustive list of issues to consider). It is also worthwhile communicating the problem of marine litter and any Coastal Litter Management Plan widely within the Duty Body to increase general awareness.

Further guidelines that can be used to inform a staff manual for shoreline cleaning:

Environmental considerations
See section 2.1.4 above

Hazardous waste/explosives/contamination
If contaminated seaweed (oil/chemical/inorganic substance) comes ashore, provision should be made for its safe removal by firstly seeking advice from SEPA.
If any item of marine litter is considered to be a risk of explosion the Fire Service or Coastguard should be contacted by dialling 999. A Coastal Litter Management Plan should include a standard response plan to such issues that staff can adhere to.

Stranded or oiled marine mammals and seabirds
In the case of strandings or other incidents involving distressed wildlife the British Divers Marine Life Rescue should be contacted on 01825 765546 (office hours) or 07787 433412 (out of hours) or SSPCA hotline 03000 999 999. Any dead cetaceans, seals or turtles should be reported to SAC Veterinary Services on 01463 243030. In the case of a dead swan, goose or duck or ten or more dead wild or garden birds together in the same place, please report this to Defra using the Defra Helpline on 08459 33 55 77**.** All other dead animals should be handled only with disposable protective gloves and should be rendered, never sent to landfill. A Coastal Litter Management Plan should include a standard response plan to such issues that staff can adhere to.

Health & Safety
A risk assessment should be undertaken by any organisation with staff undertaking coastal cleaning. A format can be found in Appendix I. Local Authorities may already have standard risk assessment templates in place. Care should be taken by anyone involved in beach cleaning when accessing beaches via slippery rocks or when working on mudflats.
Some beaches and mudflats have large tidal ranges and so cleaning should begin 1 hour after high tide to avoid people and equipment being cut off by an incoming tide. Tide tables for the week ahead are available on the BBC website at http://news.bbc.co.uk/weather/coast_and_sea/tide_tables/. For longer range forecasts local tide tables would be available from a nearby chandlery.

2.3 Produce Coastal Litter Management Plan

The following is a list of suggested contents for a Coastal Litter Management Plan. Obviously each coastal area has different features, levels of litter and community needs and therefore contents and format will vary.

- Introduction
- Marine litter background
- Objectives of Plan
- General map of area indicating shorelines and categories
- General description of coastline and uses
- Explanation of beach categories, cleanliness targets
- Summary of any agreed initiatives or actions such as bin types, signage, working with local retailers etc
- Support provided by Duty Body for community/volunteer/Criminal Justice beach cleans (see section 3 below)
- Advice and initiatives on litter data gathering (see section 4 below)
- Individual Beach description pages
- Staff rota by area
- Contact details as appropriate by area/department

2.3.1 Examples of Coastal Litter Management Plans

The following are examples of plans that have already been written and published in Scotland.

Dumfries & Galloway Marine & Coastal Litter Plan 2009-2012
http://www.dumgal.gov.uk/index.aspx?articleid=11484

Award Beaches Litter Plan North Fife 2012
http://www.fifedirect.org.uk/publications/index.cfm?fuseaction=publication.pop&pubid=D6AA8C50-F84A-6901-9E1BF42BEBC957B7

2.3.2 Approval, Adoption by Duty Body and Publication

It is appropriate to present the Coastal Litter Management Plan to a full Council meeting or relevant committee for official sign-off and adoption. This ensures that all Council or committee members are aware of the Plan and agree with the content. It is also worth publicising the publication of the document within the Duty Body and amongst the general public so that the local community and visitors can appreciate the aims and actions of the Plan.

The Firth of Clyde Forum can also review plans and, if endorsed, include the plans on the Forum website. Contact the Project Manager at clyde@clydeforum.org for further information.

2.4 Review Plan and revise

As with any plan, the document should be reviewed on a regular basis, perhaps annually depending on resources available and updated with changes

3. WORKING WITH VOLUNTEER AND OTHER GROUPS

3.1 Volunteer clean-ups

Duty Bodies should encourage any members of the public or community groups wishing to engage in beach cleaning. Not only does this raise awareness amongst the community about the issue and sources of marine litter, but it can be used to complement existing coastal litter management operations. It is recommended that Duty Bodies encourage volunteer groups to sign up for the Marine Conservation Society Beachwatch scheme[13] which provides information on how to organise a beach clean including the equipment required, health & safety precautions and insurance. The advantage of Beachwatch is that it is not just a beach clean but a litter survey as well. Completing the survey provides important information on the types and sources of beach litter being found. Participating groups pick up and record all litter in a 100m stretch of the beach they are cleaning. The survey should only take about 1 hour to complete, depending on how littered the beach is, and can be done with just a few people. As a result of these surveys MCS has a 19 year dataset, the only long-term beach litter dataset in the UK. This data is being used to develop strategies to tackle litter at source, such as the Scottish Government's National Marine Litter Strategy (see Appendix II for survey form).

If volunteers do not wish to survey litter, but do want to be involved in a litter clean up event, Keep Scotland Beautiful can provide a free clean up kit to organisers, along with details on who to contact in the relevant local authority to ask for further support.

Local Authorities are encouraged to supply materials to help with any beach cleaning such as litter pickers, gloves, bags, a collection service or, if appropriate, a skip. It is worth considering sending letters of thanks and/or certificates of recognition to local community groups that are regularly involved in shoreline cleaning activities. Some Local Authorities provide low levels of funding to encourage and support community actions via organisations such as the Group for Recycling Argyll & Bute.

Likewise, any group considering a beach clean should contact their Local Authority in order to make use of resources. The Local Authority should be able to provide sample risk assessments and Health & Safety guidance also.

Organisations currently known to be organising regular beach cleans around the Firth of Clyde area are listed below. Please note that many other community groups, businesses and school parties arrange beach cleans but it is not possible to include all those in this document.

Beachwatch Bute
Clydebelt (W Dunbartonshire)
Group for Recycling Argyll & Bute
Helensburgh East Esplanade Protection Group
Keep Scotland Beautiful – Spring Clean campaign over 2 months
Marine Conservation Society Beachwatch events
Surfers Against Sewage

3.2 Criminal Justice Teams

The Criminal Justice Social Work (CJSW) Services[14] ensures that people placed on community service orders carry out work that has a direct benefit to their community, makes proper reparation for their actions and also encourages the development of personal and practical skills that might hold future benefits for those taking part. Coastal clean-ups are ideal examples of such an activity and many Local Authorities organise coastal clean-ups in conjunction with Social Services in their area.

[13] http://www.mcsuk.org/beachwatch
[14] http://www.cjsw.ac.uk

4. DATA AND MONITORING

4.1 Litter Data Collection

The collection of data on marine litter provides information on amounts, trends and sources of marine litter. This information can be used to focus on effective mitigating measures and to test the effectiveness of existing or introduced legislation and regulations designed to reduce the input of litter to the marine environment. It may also be used to inform progress against targets under the Marine Strategy Framework Directive. The collection simply of total weight of litter collected does not provide enough information on different types of litter, trends and sources and if collected mechanically can also include the weight of organic material such as seaweed. However the capacity of Duty Bodies to collect useful data is restricted by:

- the absence of technology to effectively and safely separate inorganic and organic litter (for example, seaweed),
- the varied types of litter collection and disposal methods (from sophisticated beach cleaning machinery to plastic bags) making comparisons of litter levels difficult,
- the reliance on volunteer beach cleaners who may not be able to accommodate the additional responsibility of data collection,
- the lack of experience and systems for data collection among many agencies responsible for beach litter management.

It is therefore recommended that, within each Local Authority area, certain beaches be identified as reference beaches and that local volunteer groups are encouraged to perform quarterly surveys on those beaches using the Marine Conservation Society's Beachwatch scheme[15]. See Appendix I for Beachwatch survey form.

Local volunteer groups or schools wishing to carry out cleaning activities without undertaking detailed surveys should still be encouraged to do so as this can form an important part of a Coastal Litter Management Plan for a particular area.

OSPAR has produced guidelines on monitoring litter in the OSPAR Maritime Area[16]. The Firth of Clyde lies in OSPAR region 2 – Celtic Seas. The guidelines provide criteria on the selection of reference beaches, the area to survey and the recommended timing of surveys (see below). They also include a useful photo identity guide for all types of marine litter.

Selection of reference beaches

The following criteria have been identified for selecting reference beaches:

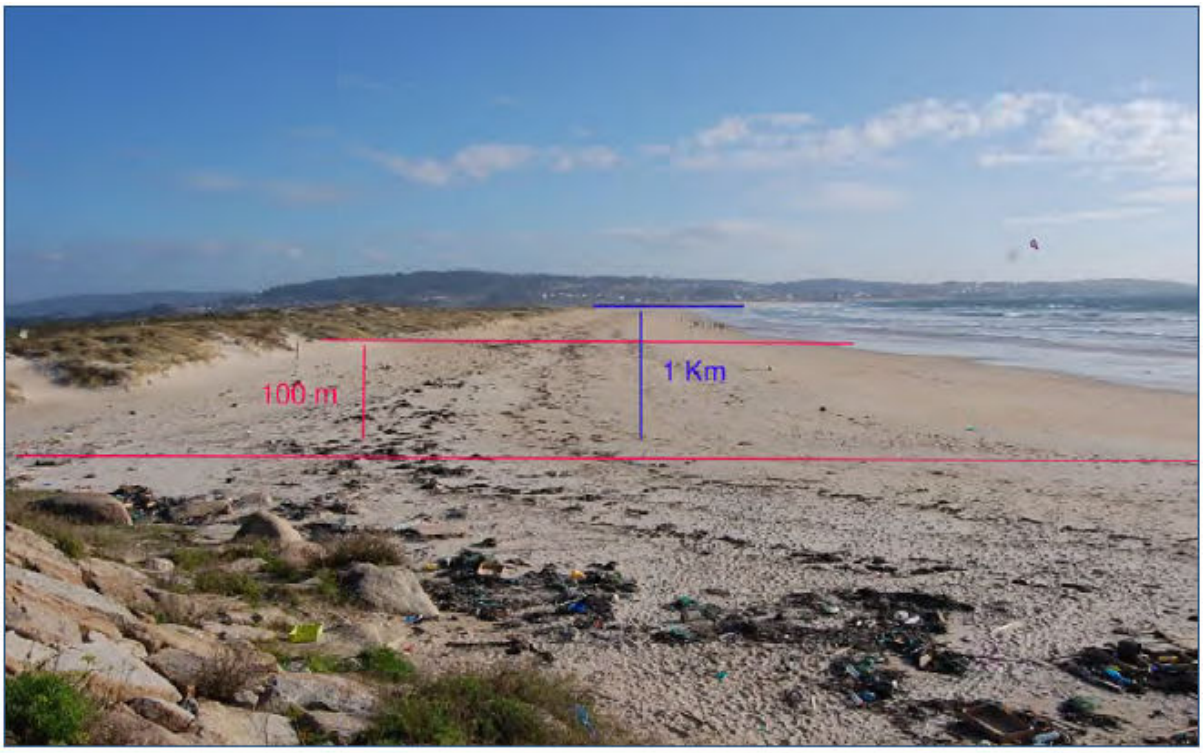
Preferably, the beaches should:

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

In each case, these criteria should be followed as closely as possible. However, the coordinators can use their expert judgement and experience of the coastal area and marine litter situation in their particular country when making the final selection of the reference beaches. For example, in some countries the local conditions do not allow for selection of beaches composed mainly of sand, and in some places survey sections of 1 km in length cannot be selected.

[15] http://www.mcsuk.org/beachwatch/

[16] OSPAR Commission (2010) – Guideline for Monitoring Marine Litter on the Beaches in the OSPAR Maritime Area. http://www.ospar.org/documents/dbase/decrecs/agreements/10-02e_beachlitter%20guideline_english%20only.pdf



Survey from water edge to back of beach

Beach surveys four times a year

The reference beaches are surveyed 4 times a year. However, circumstances may lead to inaccessible and unsafe situations for surveyors: heavy winds, slippery rocks and hazards such as rain, snow or ice, etc. The safety of the surveyors must always come first.

The survey periods are as follows:

1. Winter: Mid-December–mid-January
2. Spring: April
3. Summer: Mid-June–mid-July
4. Autumn: Mid-September–mid-October

Preferably, the surveys should be carried out within the shortest timeframe possible within a survey period for all participating beaches in the classified regions as shown on the opposite page. Coordinators within these regions should arrange the survey dates bilaterally. Furthermore a given beach should be surveyed on the same days each year if possible.

Note that the Marine Conservation Society's Beachwatch stipulates a slightly different methodology requiring a survey length of 100 metres and from the last high tide mark (strandline) to the back of the beach. For more information on this, visit the MCS website at http://www.mcsuk.org/beachwatch/ .

4.2 Visitor Monitoring

During shoreline visits by staff, Local Authorities may wish to collect data on visitor types and numbers. Appendix III shows a survey form that can be used or adapted for this purpose.

5. USEFUL LINKS

Group for Recycling Argyll & Bute
www.grab.org.uk

Keep Scotland Beautiful
www.keepscotlandbeautiful.org
http://coastal.keepscotlandbeautiful.org/documents/litter-scottish-beaches.pdf - Litter & Scottish beaches. A guide for the public & practitioners.

KIMO
http://www.kimointernational.org/MarineLitter.aspx
http://www.kimointernational.org/KIMOPublications.aspx for 'Economic Impacts of Marine Litter 2010'

Marine Conservation Society
www.mcsuk.org

Maritime Coastguard Agency
www.dft.gov.uk/mca/

RNLI (including beach safety pages)
http://rnli.org/Pages/default.aspx

Scottish Environment Protection Agency
www.sepa.org.uk

Scottish Natural Heritage
www.snh.gov.uk

Scottish Government website
http://www.scotland.gov.uk/Topics/marine/marine-environment/cleanseas/litter - general
http://www.scotland.gov.uk/Publications/2012/09/6461 - 'Marine Litter Issues, Impacts and Actions' report by Tavis Potts and Emily Hastings.

Tide Timetables
http://news.bbc.co.uk/weather/coast_and_sea/tide_tables/

United Nations Environmental Programme
http://www.unep.org/regionalseas/marinelitter/

Weather
http://www.metoffice.gov.uk/

APPENDIX I – Sample Risk Assessment Form

TASK BASED RISK ASSESSMENT		
TASK	**BEACH CLEANING**	
Other information relevant to this task		
Identified hazards		
Who Might be Harmed and How		
Control measures for identified hazards with risk-rating		**S X L = R**
Emergency/Contingency Arrangements (where risk rating is 6 or more)		
Further action (if applicable)		
Assessment By / Date	**Date of next review** :	

Advice and Instructions on calculating the Risk Rating (S x L = R)

Risk Rating

This is the numerical value derived from multiplying the **Hazard Severity** by the **Likelihood of Incident Occurring**.

This calculation will quantify the risk potential either actual or perceived, having first examined, reviewed and assessed existing controls; information available; training records; and or best practices demonstrated.

Hazard Severity (S) - Explanation

A hazard is something with the potential to cause harm, which can vary in severity of outcome. The severity of a hazard should be rated according to the following table:

S4	A fatal injury or illness.
S3	A major injury or serious illness may occur eg fractures or loss of consciousness.
S2	Outcomes where persons are likely to be off work for more than three days or where there may be recurring injury or ill-health.
S1	All other outcomes, including where persons may incur injuries resulting in periods of absence from work for up to three days.

Likelihood of Incident Occurring (L) - Explanation

This is the consideration of how likely an incident is to occur, and should be rated according to the following table:

L4	High - Where it is certain that an incident will occur.
L3	Medium - Where it is probable that an incident will occur.
L2	Low - Where an incident is possible.
L1	Very Low – Where an incident is unlikely.

Calculating a Risk Rating (R)

This matrix shows how the Risk Rating is then calculated:

	L1	**L2**	**L3**	**L4**
S1	1	2	3	4
S2	2	4	6	8
S3	3	6	9	12
S4	4	8	12	16

The aim is to reduce the Risk Rating to as low as is reasonably practicable - a score of 3 or less is usually regarded as acceptable and scores of 12 or above are clearly unacceptable. Where the risk rating is greater than 3, consider again if all possible controls have been utilised. If not, then the line manager needs to decide whether the activity should go ahead or not by analysing and comparing the benefits of carrying out activity against the actual or potential costs associated with the increased risk. Where risk ratings are 6 or above, emergency/contingency arrangements need to be included in the section of the risk assessment detailed for this purpose.

APPENDIX II Marine Conservation Society Beachwatch survey form

Beachwatch Survey Summary

- Use this form to summarise your survey data and return it to MCS
- Please fill in one form for each beach surveyed
- Please call MCS if you need more copies

* This is essential information

Beach name *

Beach county & nearest town

OS Reference*

Organiser's name*

Organiser's contact details*

Address:

Telephone:
E-mail:

About your survey

What was the date of your survey?*

What time did you start your survey?*

What time did you finish your survey?*

How many volunteers took part?*

What is the length of the beach you surveyed (m)?*

What is the average width of beach you surveyed?*

Did you clean, but not survey, any extra areas? If so, please tell us the length (m)

How many bags of rubbish did you collect from the survey area?*

What was the total weight of all the bags of rubbish you collected from the survey area(kg)?*

What was the weather like in the week before the survey?

Winds: offshore ☐ onshore ☐
light ☐ strong ☐

Seas: calm ☐ moderate ☐ rough ☐

Other comments:

About what you found

Did you find any foreign or traceable items?
Note down all the foreign or traceable items indicating identifying marks, such as country of origin, company, serial no. etc.

Did you find any unusual items?
Include all these items when calculating the total numbers overleaf.

Did you find any stranded, entangled or dead animals?
*Please describe the animal, or note the species name if known, and describe any injuries, the nature of the entanglement or possible causes of death. If you find a stranded or injured animal phone the **RSPCA** on 0300 1234999 or the **SSPCA** in Scotland on 03000 999999 immediately.*

Was there any oil, tar or other pollutants?
If you encounter a pollution event or algal bloom, please report it to the Environment Agency or Scottish Environment Protection Agency Hotline 0800 807060

Oil/tar:
absent ☐ trace ☐ some ☐ objectionable ☐

Plastic pellets: Small, round, white or coloured pellets approx. 3-5mm in diameter
absent ☐ present ☐

Any other information?

PLEASE TURN OVER

The Marine Conservation Society is the UK charity for our seas, beaches and wildlife
MCS Unit 3 Wolf Business Park, Alton Road, Ross-on-Wye, Herefordshire HR9 5NB Tel: 01989 566017 Fax: 01989 567815

Beachwatch Survey Summary contd.

Please enter actual values only - 'lots', 'many', 'bag fulls' or '100s' can't be used. Complete one survey summary per event.

Plastic	total number
4/6 pack yokes	
Bags (including supermarket)	
Bottles, containers and drums	
- Drinks	
- Cleaner	
- Food (e.g. pots, tubs, sachets)	
- Foreign	
- Oil	
- Toiletries	
Caps / lids	
Cigarette lighters / tobacco pouches	
Combs / hair brushes / sunglasses	
Crisp / sweet / lolly / sandwich wrappers	
Cutlery / trays / straws / cups	
Fish boxes	
Fishing line (anglers)	
Fishing net & net pieces < 50 cm	
Fishing net & net pieces > 50 cm	
Floats (fishing buoys) / reels	
Industrial packaging / crates / sheeting	
Lobster / crab pots & tops	
Mesh bags (eg. vegetable)	
Pens	
Rope / cord / string	
Shoes / sandals	
Shotgun cartridges	
Strapping bands	
Toys / party poppers / fireworks / dummies	
Traffic cones	
Plastic pieces < 2.5 cm	
Plastic pieces > 2.5 cm	
Other (specify)	

Polystyrene	
Buoys	
Fast food containers / cups	
Fish boxes	
Fibreglass	
Foam / sponge / insulation	
Packaging	
Polystyrene pieces < 50 cm	
Other (specify)	

Rubber	
Balloons / balloon string	
Boots	
Gloves (heavy duty)	
Gloves (light weight)	
Rubber pieces < 50 cm	
Tyres without holes / wheels	
Tyres with holes	
Other (specify)	

Cloth	
Cloth pieces	
Clothing / shoes / beach towels	
Furnishings	
Sacking	
Other (specify)	

Metal	total number
Aerosol cans	
BBQ's (disposable)	
Bottle caps	
Car parts / car batteries	
Drink cans	
Fishing weights / hooks / lures	
Foil wrappers	
Food cans	
Lobster / crab pots & tops	
Oil drums	
Scrap / metal appliances / paint tins	
Household batteries	
Wire / wire mesh / metal pieces	
Other (specify)	

Medical	
Inhaler	
Plasters	
Syringes	
Other (specify)	

Sanitary	
Condoms	
Cotton bud sticks	
Nappies	
Tampon applicators / tampons	
Toilet fresheners	
Towels / panty liners / backing strips	
Wet wipes	
Other (specify)	

Animal faeces	Don't touch!
In bags	
Not in bags	

Paper	
Bags	
Cardboard	
Carton / tetrapack e.g. juice	
Carton / tetrapack milk	
Cigarette packets	
Cigarette stubs	
Cups	
Newspapers / magazines	
Other (specify)	

Wood	
Corks	
Lobster / crab pots & tops	
Pallets / crates	
Ice lolly sticks / chip forks	
Paint brushes	
Wood pieces (not twigs etc.)	
Other (specify)	

Glass	
Bottles	
Light bulbs / tubes	
Glass pieces	

Pottery/ceramic	
Any pottery or ceramic	

Appendix III - Visitor Monitoring

VISITOR MONITORING PROJECT - OBSERVATION SHEET

Please start a new sheet every 15 minutes. Please note any breaks in monitoring on the back of this sheet.

Location			LB		Start Time		:00		:15		:30		:45		
Observer					Day & Date										
ENTERING															
Vehicles															
cars															
adult car occupants	1		2		3		4		5		6		7		8
child car occupants	1		2		3		4		5		6		7		8
minibuses															
coaches															
vans/transits															
lorries/HGVs															
motorcycles															
park vehicles															
ATVs															
Non-Vehicles															
on foot - adults															
on foot - children															
bicycle - adults															
bicycle - children															
prams/buggies															
dogs															
horses															
LEAVING															
Vehicles															
cars															
adult car occupants	1		2		3		4		5		6		7		8
child car occupants	1		2		3		4		5		6		7		8
minibuses															
coaches															
vans/transits															
lorries/HGVs															
motorcycles															
park vehicles															
ATVs															
Non-Vehicles															
on foot - adults															
on foot - children															
bicycle - adults															
bicycle - children															
prams/buggies															
dogs															
horses															
WEATHER	*(please tick best description per column for this observation period)*						sunny		hot		dry				
							sun & cloud		mild		showery				
							cloud		cool		wet				

Source: Clyde Muirshiel Regional Park