Sustainability Committee

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Evidence Session for the Sustainability Committee on petition PO63:Banning Plastic Bags

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Executive summary

The Marine Conservation Society supports efforts made to reduce plastic and plastic bag waste in Wales and fully supports the petition for banning of plastic bags, providing it is accompanied with a levy at point of sale on all alternative bags.
To avoid repetition with evidence presented by Keep Wales Tidy, this paper outlines the studies undertaken in the marine environment on plastic bags and their impacts.

Introduction

The Marine Conservation Society (MCS) is the UK charity dedicated to the protection of our seas, shores and wildlife. MCS campaigns for clean seas and beaches, through our beach litter survey Adopt-a-Beach programme and its flagship annual Beachwatch event. Through education, community involvement and collaboration, MCS raises awareness of the many threats that face our seas and promotes individual, industry and government action to protect the marine environment. MCS has been campaigning on plastic bags for many years and were invited to give evidence on Environmental Levy on Plastic Bags (Scotland) bill in June 2005. MCS have been working with Modbury and the Daily Mail in their Banish the Bag campaign.
The issues of plastic bags has received much media attention over the last year, starting with the town of Modbury in Devon becoming the first plastic bag free town in the UK. BBC camerawoman Rebecca Hosking, inspired her town to go plastic bag free after making the BBC documentary ‘Message in Waves’. As a result of the publicity surrounding the issue, over 70 UK towns are now planning to follow suite. (See Appendix A for list of other towns in the planning stages of going plastic bag fee). The National Assembly and Welsh Assembly Government have already demonstrated their support for this scheme, by providing funding to Sustainable Wales.
The idea of going plastic bag free is not unique to the UK, indeed many other countries are ahead of us in banning or taxing this form of packaging (see appendix B for other nations which have implemented either an outright ban or taken measures to reduce plastic bag usage).
The suggestion to ban plastic bags which won the public vote for the BBC Wales project, demonstrates the strength of feeling and general support for this petition. In implementing a ban practical issues will need to be considered as well as

implications to the Welsh economy and the retail sector. Some of the issues regarding alternatives to plastic bags are discussed within this paper, however plastic bags are a nuisance and are easily replaceable with more environmentally sound alternatives. The experience of Modbury has shown that the banning of plastic bags has led consumers and retailers to not only consider how to reduce other forms of packaging but also to look at other aspects of living more sustainably.

1. Plastic bags in the environment

There is a great deal of data on plastic in the environment, however data on plastic bags in particular, are more limited. In this paper as well as citing some specific references relating directly to plastic bags, MCS also quotes some data on plastics in general, as this does include plastic bags.

1.2 Plastic degradation

Plastics are the most common man-made item sighted at sea, and many surveys, both in the UK and other countries report that plastics constitute the majority (>50%) of debris found on beaches. Plastics are resistant to biodegradation because no natural biological organisms exist which can break down plastic, so plastics are only broken down through weathering.

Plastics at sea break down at a much slower rate than plastics exposed to weathering on land (Packforsk, 1989) mainly because temperatures at sea will be lower than on land thus slowing the degradation process. The rate of breakdown can be further reduced by chemical or biological fouling (Andrady, 2000)

Estimates for plastic degradation at sea range from 450 to 1,000 years. Even when they do break down gradually through mechanical action, they break down into smaller and smaller pieces and ultimately into microscopic plastic pieces.

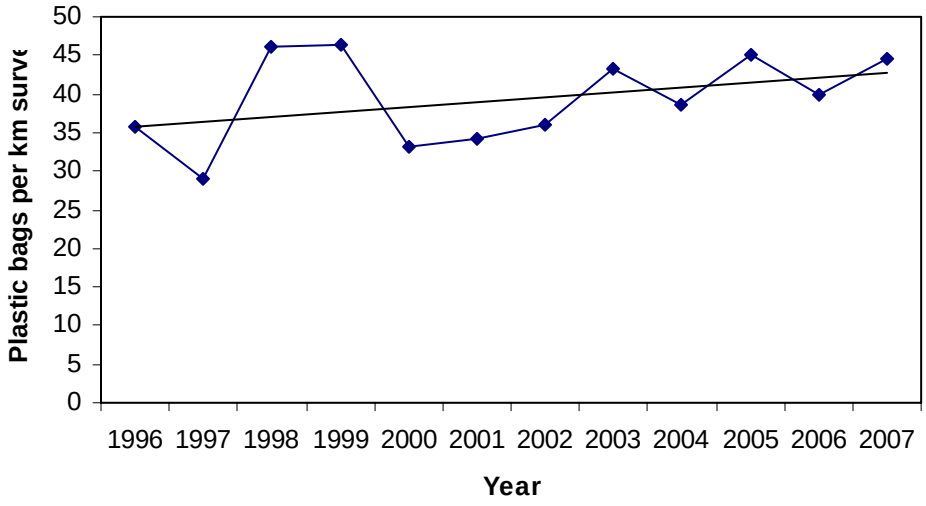
Because of their lightweight nature, plastic bags are readily carried by the wind. Indeed, they often blow out of litterbins and landfill sites, following even proper disposal. When they land in rivers or the sea, however, the surface tension of the water prevents them blowing any further.

Wave action then expels air from the bag and eventually they become neutrally buoyant, and float in suspension where they can entangle, or be ingested by, marine organisms. Eventually they will break up into smaller fragments and be deposited on the sea floor. Whole plastic bags can also make their way to the sea bottom and smother flora and fauna.

2 Plastic bags in the marine environment

UK surveys have recorded a significant increase in plastic litter found on beaches from 1980 to 1991 (Dixon, 1995), and from 1994 to 2007 (MCS, 2007). Large numbers of plastic bags are found on UK beaches, reaching average densities of one bag every 23 metres(MCS 2007), and the potential threat they pose to wildlife makes them a hazardous form of litter.

Beachwatch is a UK wide beach clean and survey organised by the Marine Conservation Society that has taken place every September since 1993,. During the Beachwatch 2007 event, 7,504 plastic bags were found on 354 beaches around the UK. On average 44 bags were found for every kilometre of coastline surveyed. Plastic bags ranked number 15 in the top 20 most common litter items recorded, accounting for 2% of all beach litter. In Wales the amount of plastic bags was higher than the UK average, with 887 bags found on 38 beaches amounting to 57 items/km.



In the Irish Sea, plastic items comprised 94-98% of litter found on the seabed during trawls in March 1996 and August 1999, the majority of plastic items were plastic bags and food wrappers (Tang, 2005).

During the 2006 International Coastal Clean-up (ICC), which took place in over 60 countries worldwide, 691,048 plastic bags were found, accounting for 9% of all litter found. In addition, the ICC reported that 2% of all animals found dead during the survey had been entangled in plastic bags (ICC, 2006).

In 1995, high numbers of plastic bags (more than 70% of total litter) were reported in dredge samples from the continental shelf along the French and Spanish Atlantic Coast (Galgani et al,1995). During a survey of floating marine

debris conducted in the South East Pacific plastic bags far outnumbered other items at 47.6% of all items (Thiel et al, 2003).

Offshore surveys of floating marine debris in the North East Atlantic, carried out by the Hebridean Whale and Dolphin Trust from 2003 to 2005 found plastic bags to be the most common litter item seen at sea. In 2003, a total of 208 floating litter items were observed, 88 of these were plastic bags. In 2004, out of 209 items observed, 50 were plastic bags, and in 2005 out of 101 items observed, 34 were plastic bags. Plastic bags thus accounted for 42.3%, 23.9%, and 33.6% respectively of all floating litter observed in these surveys.

2.1 Microplastics

Studies of sediments taken from 6 sites around Plymouth, Devon, and 17 other sites around the UK coastline have found microplastics to be common in sedimentary habitats, and most common in subtidal sediments. Microscopic plastics have been found in plankton samples dating back to the 1960s, but a significant increase in abundance has been recorded from the 1960s to the present time (Thompson *et al*, 2004).

2.2 Toxic effects

Plastic can contain toxic compounds either adsorbed onto the plastic from surrounding seawater, or added to the plastic during production as plasticizers and other additives (Mato et al, 2001). Toxins adsorbed onto plastic may be ingested by filter feeders (Thompson, 2004), and may be passed up the food chain to fish and ultimately to human consumers.

3. Impacts of plastic bags

3.1 Wildlife impacts

Plastic bags can be mistaken for food and consumed by a wide range of marine species. Ingestion of litter such as plastic bags can cause physical damage and mechanical blockage of the oesophagus and digestive system, resulting in a false sensation of fullness or satiation, as the litter may remain in the stomach. This can lead to internal infections, starvation and death (Laist, 1997).

Plastic has been recorded as a cause of entanglement in many marine animals. Entanglement can restrict movement, leading to starvation, drowning or suffocation. Once the entangled animal dies, their bodies decompose and the plastic item that caused their entanglement can trap other animals.

Plastic bags have been found in stomachs of the following marine species, several of which are classified as endangered*: *Green turtle (Uchida, 1990; Balazs 1985; Meylan 1978) *Loggerhead turtle (Plotkin and Amos 1990; Bjorndal

and Bolten, 1994) *Hawksbill turtle (Teas and Witzell, 1994; Hartog 1980) *Leatherback turtle (Balazs, 1985; Sadove and Morreale, 1990) *Black footed Albatross (Sileo et al 1990) Northern Fulmar (van Franeker, 1985, 2003, 2005) Herring Gull Great Black-backed Gull (Day et al, 1985) *Harbour Porpoise (Walker and Coe, 1990) Common Dolphin, Bottlenose Dolphin, Risso's Dolphin, Northern Right Whale (Walker and Coe, 1990) Pygmy Sperm Whale (Tarpley, 1990) Blackfin tuna (Manooch and Mason, 1983).

Appendix C gives details of examples of other marine wildlife that have ingested plastic bags

3.2 Other impacts

Fishermen report that plastics foul propellers and that plastic bags and sheeting clog seawater intakes and evaporators, causing engine failure, costly repairs, and delays. This type of vessel disablement can be life threatening. The RNLI reported that 1% of all deaths recorded from fishing vessels between 1992-2001 were caused by fouled propellers, and that nearly 300 calls to the RNLI were because of fouled propellers (RNLI, 2005).

4. Introducing a plastic bag tax/ban

The Irish Government introduced a plastic bag tax in March 2002, which has been very successful in reducing plastic bag use by 90%. A charge of 15 cents (9 pence) was added to the use of any carrier bag and all funds obtained were channelled into environmental initiatives within the country (ENDS, 2002a; BBC, 2002a).

Reports from the plastics industry indicate that sales of kitchen tidy bags rose by 77% after the tax was introduced. However, this is not a significant increase in comparison to the reduction in plastic shopping bags, as the base level of kitchen bin bag sales was minor in comparison to number of plastic shopping bags used.

In implementing a plastic bag ban or tax it is vital that other forms of single use packaging do not simply replace plastic shopping bags. Replacing free plastic bags with other bags such as paper shopping bags is not a solution. Indeed, more energy is needed to produce and transport paper bags. The public should instead be encouraged to reduce the number of bags used by reusing bags, rather than replacing one form of disposable bag for another.

The public should also be made aware of the problems of degradable plastic. 'Degradable' bags are still plastic but have an additive which accelerates their breakdown into their plastic components, so should be discouraged.

5. Recommendations

MCS supports the introduction of a ban on plastic bags on the grounds that plastic bags are an ubiquitous, easily and widely dispersed, long-lasting, unsightly and hazardous form of litter, posing a threat to marine animals many of which are already endangered or threatened by human exploitation or activities.

A plastic bag ban, if implemented correctly, ensuring that other forms of packaging do not simply replace them, could contribute to a significant reduction in the quantities of plastic bags littering our landscapes, beaches and seas and help reduce one of the modern-day consumer's impacts on marine wildlife.

- MCS fully support Petition P063 to ban plastic bags in Wales, a move supported by the Welsh people, but not popular with some retailers.

- Whether the National Assembly and Welsh Assembly Government decide for or against an outright ban, a levy of a minimum 10 pence per bag should be implemented.

- Should plastic bags be banned or a levy introduced in Wales, MCS would strongly recommend that **any** alternatives provided at point of sale be charged for. Alternatives can include cloth, paper or biodegradable or compostable bags such as cornstarch.

- As alternatives are generally more costly than plastic bags, MCS would recommend that a levy on alternatives could be used by retailers to provide sustainable alternative bags at point of sale.

- Any tax generated on sale of plastic bags should be used by the National Assembly and Welsh Assembly Government to fund environmental projects.

- If cloth, bio, or paper replacements are used, these should be encouraged to be fair trade, unbleached, non-GMO products printed with vegetable water dyes, and preferably from a source which would keep the carbon footprint low.

- Alternative biodegradable/compostable bags should be thoroughly investigated to ensure that they are truly biodegradable and if possible that the base stock is not grown on land better suited for food production.

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Appendix A

Modbury, Selkirk, Hebden Bridge, Girton, Overton , Tisbury and Hay on Wye – the first town in Wales - are already plastic bag free towns.

Towns in Wales planning to go plastic bag free:

- Porthcawl, Bridgend
- Newcastle Emlyn, Carmarthenshire
- Fishguard, Pembrokeshire
- Broadhaven, Pembrokeshire
- Llangollen, Denbighshire
- Newport, Newport
- Newtown, Powys
- Llanidloes, Powys
- Llandysilio, Powys
- Cowbridge, Vale of Glamorgan
- Swansea, Swansea

Towns in the rest of the UK planning to go plastic bag free:

Appendix B

Nations who have outright banned (OB) or taken measures to reduce plastic bag use:

Bangladesh, (OB)
Ireland, (Levy)
Taiwan,
France, (OB 2010)
West Bengal, (OB)
Tanzania, (OB)
Switzerland
Rwanda (OB)
Pakistan, (OB)
Germany
South Africa, (OB)
Italy, (OB 2010)
Australia, (OB in supermarkets 2008)
India, (OB in area's including Mumbai)
Somalia, (OB)
Botswana, (OB)
Philippines, (OB, coming soon)
Uganda, (OB)
Kenya (OB)
Japan
Turkey
Zanzibar, (OB)
Eritrea, (OB)
Ethiopia, (OB)
Papua New Guinea, (OB)
Samoa, (OB)
Belgium, (Levy)
South Korea
Singapore
Sweden
Bhutan, (OB)
Malta

Appendix C – Some examples of marine wildlife ingesting plastic bags

In April 2002 a dead Minke whale washed up on the Normandy coast. An investigation found its stomach contained 800g of plastic bags and packaging including two English supermarket plastic bags (GECC, 2002).

In February 2004 a dead Cuviers Beaked whale was found washed ashore on the west coast of the Isle of Mull, Scotland. Cuviers beaked whales are rarely seen in coastal waters as they are predominantly a deep water species. It was found that the entrance to the stomach was completely blocked with a cylinder of tightly packed shredded black plastic bin liner bags and fishing twine.
Turtles, particularly leatherback turtles; the most commonly seen turtles in UK waters, are especially at risk from plastic bag ingestion, as these bags, especially white or clear shopping bags closely resemble jellyfish, their primary prey, when suspended in the water column. Plastic bags along with sheeting and plastic pieces are the predominant synthetic items found in the stomachs of turtles.

A Leatherback turtle stranded off Ballycotton, Ireland in 2007 had a clear shopping bag in it's stomach.
An autopsy of a dead leatherback turtle washed up in Scotland in December 1994 reported that it had died as a result of starvation, caused by primary obstruction of the digestive tract by ingested plastic and metal litter. There was also a plastic bag lodged 40cm down the oesophagus (Godley et al, 1998).

A leatherback, washed ashore in Galloway in December 1998, was found in very poor condition with plastic bags obstructing its alimentary tract. The blockage included 1 white plastic bag, 1 black plastic bin liner, 3 transparent plastic bags, 1 green plastic bag, and 1 transparent plastic bag for chicken meat packaged by a US company.

Another leatherback found dead on Harlech beach in Wales in September 1988 had a piece of plastic blocking the entrance to the small intestine, and an autopsy established this could have contributed to the animal's death (Eckert and Luginbuhl, 1988).

A study of dead stranded sea turtles on the coast of Brazil from 1997 to 1998 found the main items ingested were plastic bags. Of the 30 green turtles examined, white/transparent plastic bags were recorded in 14 (47%) of the green turtles found. Ingestion of anthropogenic debris accounted for the death of 4 (13.2%) of the green turtles examined (Bugoni et al, 2001).

A green turtle found stranded at Knott End, Blackpool, Lancashire in December 2001, was examined by Rob Deaville at the Zoological Society of London in December 2002. The examination revealed an assortment of plastic fragments within the oesophagus and stomach; the largest of which was a piece of blue balloon.

Research has shown that plastic pieces ranging in size from 4mm to several centimetres in diameter, are regularly ingested by many seabirds such as fulmars and shearwaters (Van Franeker, 2005) and even microscopic pieces can be ingested by filter feeding marine animals (Thompson, 2004).

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