

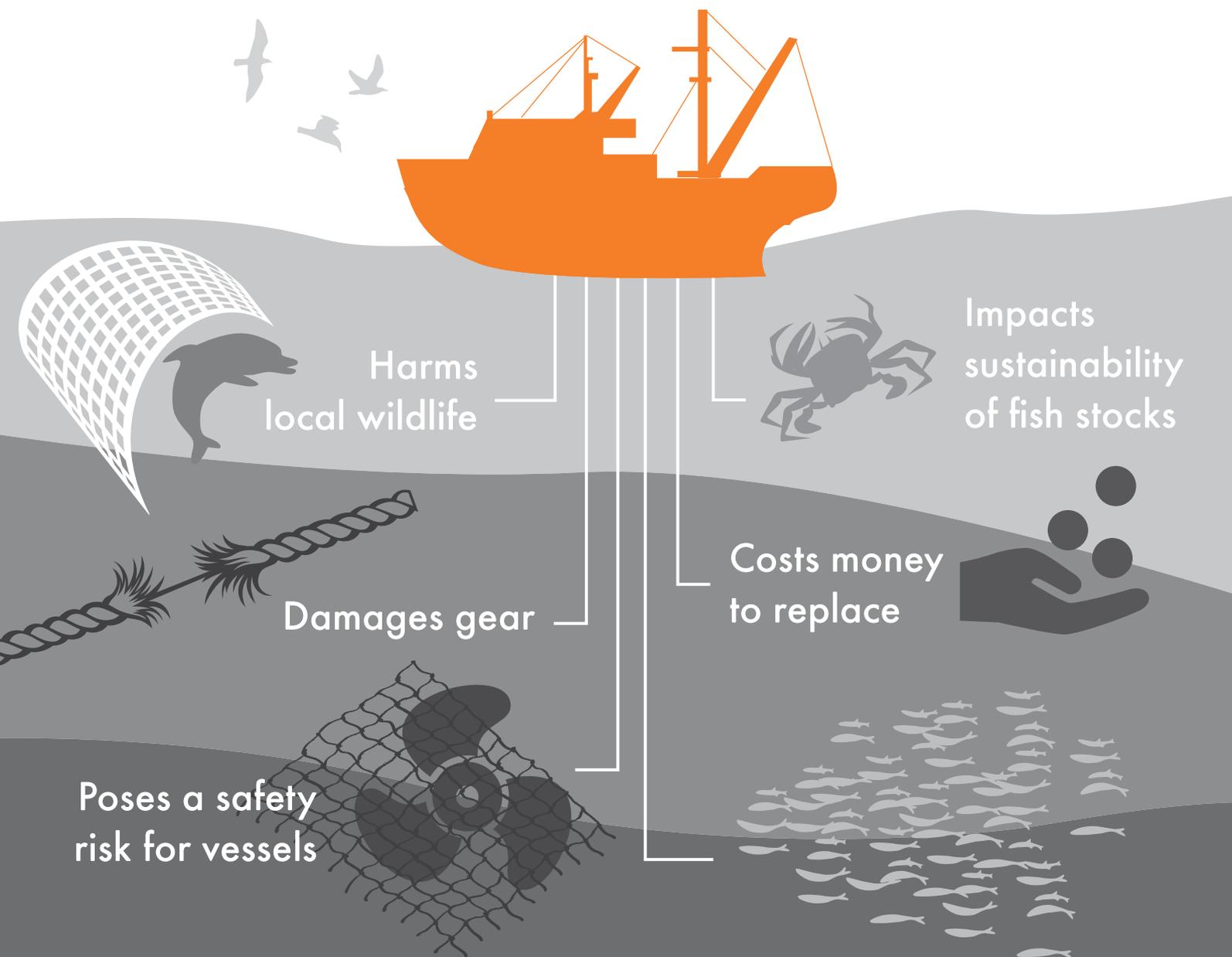


# A case study on the impact of ghost fishing gear in Cornwall, UK

We were known as **WSPA**  
(World Society for the  
Protection of Animals)

# Ghost gear

Abandoned and lost fishing gear, known as ghost gear, encompasses lines, nets, pots and ropes and are a huge threat to marine animals and coastal wildlife. Entanglement in ghost fishing gear causes huge suffering to animals and in many cases leads to a painful death. This case study highlights research undertaken by Cornwall Seal Group Research Trust commissioned by World Animal Protection and explores the severity of the ghost gear problem in Cornwall in the UK.



## The problem of marine debris and ghost fishing gear

Marine debris, are materials which are deliberately or unintentionally abandoned in the marine environment (Gall & Thompson, 2015). Marine debris is recognised as a major form of marine pollution (Laist, 1997) and is listed as a major threat to biodiversity (Gray, 1997). Marine debris poses threats of injury and death to many species of animals. During an extensive literature search Gall and Thompson, 2015 reviewed the effects of marine debris. Results showed that marine debris affects approximately 693 species living in the world's oceans (Gall & Thompson, 2015). Groups with the greatest numbers of individuals becoming entangled include seal and sea bird species. According to the review 79% of entanglement cases result in direct harm or death to the animals involved (Gall & Thompson, 2015).

Ghost gear is a specific type of marine debris and is the term used for any abandoned, lost or discarded fishing gear or related litter that can result in the entanglement or bycatch of numerous species (Butler, 2013). Ghost fishing gear includes nets, ropes, lines, pots, hooks and other items and is of particular concern as it makes up 10% of marine debris and has damaging effects on the welfare and conservation of many marine species (Macfayden et al., 2009).

It is estimated that 6.4 million tonnes of fishing gear are lost in the oceans each year (Macfayden et al., 2009). Entanglement in marine debris and specifically ghost fishing gear causes injury and death to a wide range of marine species, from mammals such as whales, seals, dolphins and sea birds to turtles, fish and invertebrates such as crustaceans and cephalopods (Macfayden et al., 2009).

## Aim of this research

The research sought to determine:

- The types of ghost gear present along the coastline of Cornwall
- The amount of ghost gear present (volume and number of items) along the coastline of Cornwall.
- To assess both the interaction and entanglement risks posed to marine animals

## Data collection

Data was collected between November 2014 and October 2015, along Cornwall's 700km of coastline.

Each month, three overlapping boat based surveys were organised covering over a 100km transect along the north coast of Cornwall. During each of these surveys, ghost gear at sea and on land was recorded, including debris such as floating nets and ropes, as well as lost buoys. It was essential to conduct the surveys on boats to ensure that a range of coastal habitats were surveyed rather than just beaches that were accessible by foot or car. Researchers logged ghost gear and each area was extensively photographed to enable ghost gear records to be added or amended after the survey for greater accuracy. Each boat survey was facilitated by two local marine group coordinators and a team of volunteer spotters.

In addition to recording ghost gear on boat based surveys, CSGRT volunteers also conducted land based surveys where they photographed ghost gear seen right around the entire Cornish coast.

For each boat survey approximately 3000 photographs were taken and each item of ghost gear seen either in the field or from photos was recorded. Data included the number of ghost gear items, the type of ghost gear (for example buoys, floats, line, monofilament net, pots, rope, rubber or other), the length and/or volume of the material and whether the item had been previously reported and if it was removed.

Based on this information two risk ratings were given to each piece of ghost gear. These were as follows.

Likelihood of animals <b>interacting</b> with the ghost gear (Interaction risks)	Likelihood of animals becoming <b>entangled</b> in the ghost gear (Entanglement risks)
<b>Possible (P)</b> If seals or birds used the area routinely	<b>Possible (P)</b> If the item was a looped/meshed or a balled mass
<b>Likely (L)</b> If seals or birds were within 5m of the item	<b>Likely (L)</b> If they were within 5m of a lopped/meshed or balled item
<b>Witnessed (W)</b> If the seals or birds were observed touching the item	<b>Witnessed (W)</b> If a seal or bird was seen entangled
<b>Unlikely (U)</b> None of the above	<b>Unlikely (U)</b> None of the above

**Table. 1. Interaction and entanglement risk ratings given to each piece of ghost gear**



## Results

After removing data for ghost gear items that had previously been recorded, the following results were obtained:

### Boat based surveys

A total of 1398 'new' ghost gear items were recorded. This amounted to 19560 litres or 20 tonnes from 46 locations across the Cornwall coastline. On average this amounted to 26 new items a week, over the course of the year. Ghost gear was distributed along the entire survey transect, whilst most sites had between two and ten items of ghost gear, five had over 10 items per visit.

### Land based surveys

A total of 2828 ghost gear items were recorded by volunteers amounting to 30,352 litres or 30 tonnes from 147 different locations. This represented 54 new items being washed in each week. Whilst most sites had between 2 and 10 items per visit six sites had over 10 items per visit,

### Types of ghost gear

From boat surveys, most gear recorded comprised buoys, followed by trawl net, monofilament net and rope (figure 1). Rope was the most widespread, found at 36 of the sites visited, followed by trawl net at 30 sites. In contrast, land based surveys recorded mostly monofilament line items, followed by rope whilst buoys and other items were most widely distributed at 28 and 27 sites respectively.)

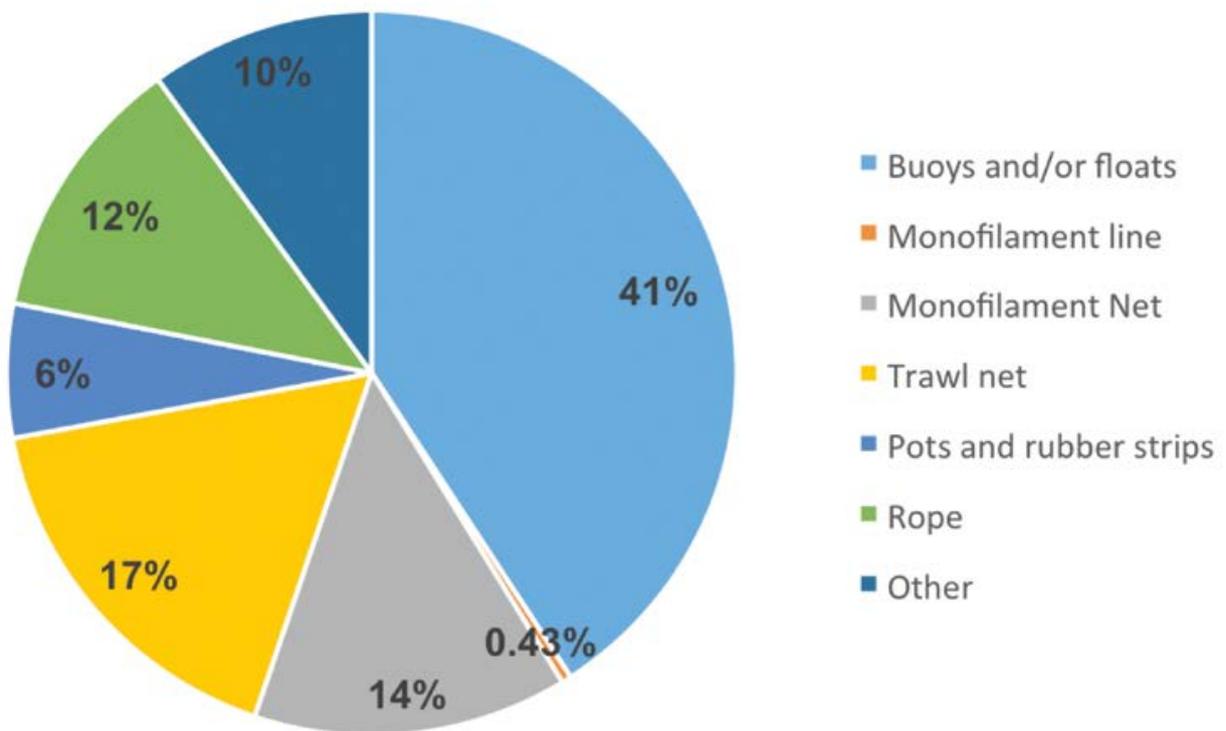


Figure 1. Total proportions of ghost gear from boat surveys classified by type

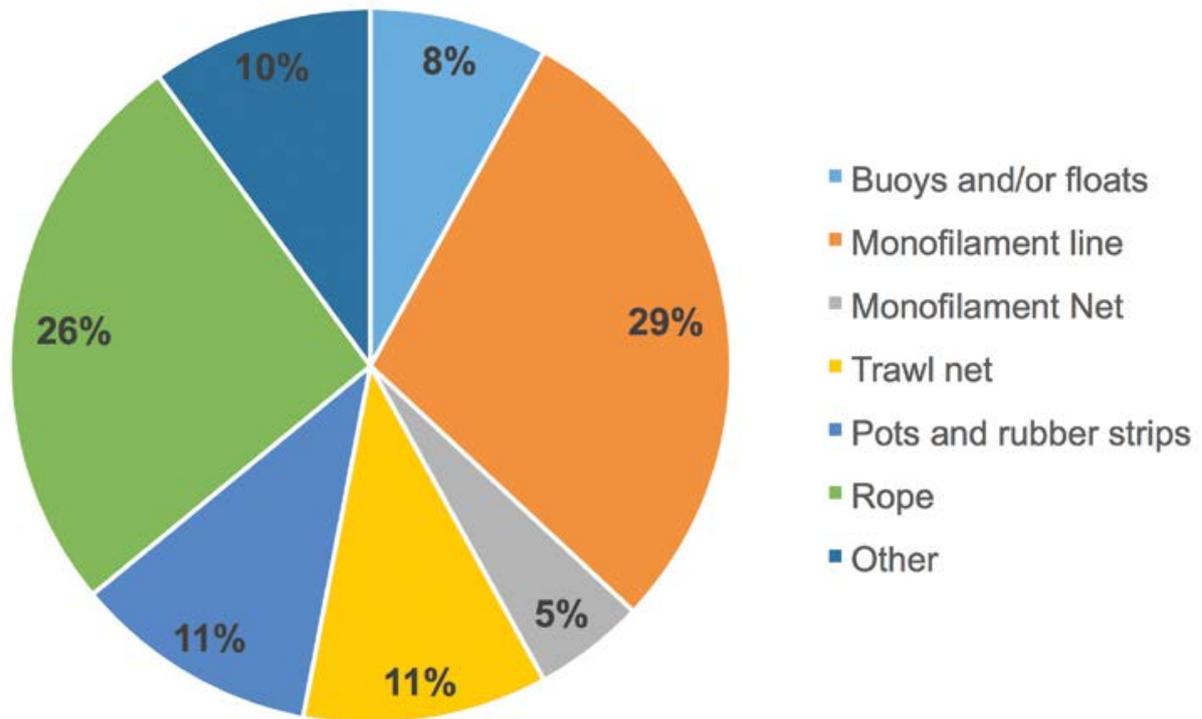


Figure 2. Total proportions of ghost gear from land surveys classified by type.

## Risks to animals from all new ghost gear recorded

### Interaction risks

*(likelihood of animals interacting with ghost gear)*

- 40% of items identified posed an interaction risk.
- At established seal sites 82% (by items) of posed an interaction risk to seals.
- Monofilament line, nets and pots posed the greatest risk to marine animals

### Entanglement risks

*(likelihood of animals becoming entangled in ghost gear)*

- 58% of items identified posed entanglement risks
- At established seal sites entanglement risks decreased to 54% (possibly because many items at seal sites were buoys and floats, posing a small entanglement risk specifically to seals).
- Trawl net, monofilament net and line, rope and pots posed the greatest risk to marine animals.

When interaction and entanglement risks were combined 26% of all ghost gear items recorded posed a serious threat to marine animals.

### Witnessed entanglement

*(animals seen to be entangled during the data collection period)*

- 12 species across six groups of animals were witnessed to be entangled in ghost gear these included 15 seals, 8 birds, 18 crabs, 9 fish, 64 clumps of mussels and 179 pink sea fans fragments.

## Animal welfare implications

Ghost fishing gear poses serious welfare concerns and can be life threatening for the individual animals that become entangled. Fishing lines, nets, ropes and other ghost gear can become tangled around heads and other body parts restricting animal's movements and foraging abilities, affecting the survival and welfare of a range of different species (Laist, 1987). In this study, of the 15 seals witnessed to be entangled of which 60% had entangling material cutting through their skin causing wounds considered to be serious and two additional entangled seals died during the study period. In this study, duration of entanglement is unclear however it is possible that animals that become entangled can be left to suffer for a number of months or even years (Allen et al., 2012).



Juvenile grey seal entangled in ghost fishing gear on 25/04/15 (rescued by BDMLR) Photo: S Sayer

## Reducing the impact of ghost fishing gear

### What Cornwall Seal Group Research Trust are doing

As part of this research, volunteers removed 14009 litres (or 14 tonnes) of ghost gear from the marine environment around Cornwall, considerably reducing the levels of risk posed by ghost gear to marine life (from 26% to 18%), particularly for seals (from 47% down to 24%). Seal and bird rescues were also conducted during this survey period and these demonstrated that even removing a small amount of looped net from a beach could save marine life from becoming entangled (Sayer and Allen, 2015).

### What World Animal Protection are doing

World Animal Protection is using this research as a case study on ghost gear in UK waters. The problem is currently under researched and in order to direct solutions most effectively we need to know where ghost gear is causing the most problems for marine wildlife and understand how we can all make a difference.

We are working with NGOs, the government and scientists through the Global Ghost Gear Initiative to track the journey of ghost gear globally and document the impact on animals, coastal communities and the environment. Through this initiative we have formed partnerships for solution projects that will stop gear entering the sea and remove what is already there. We are also working positively with corporate and fishing industry partners to ensure responsible management of fishing gear is at the heart of government and seafood policy.

No one wants to see the marine environment affected by ghost gear. Eliminating ghost gear will reap benefits for animals and all sea users.

World Animal Protection call on all potential partners interested in working together for sustainable seas to join the Global Ghost Gear Initiative. Together we can make a difference.

## Acknowledgments

We would like to thank Sue Sayer and Kate Williams authors of the Ghost Gear in Cornwall 2014/15 report.

Volunteers eagerly joined a rapidly expanding network of 'ghost gear recorders' enabling land based survey coverage of most of Cornwall's 700km of coastline. Hardy souls also volunteered to brave long days at sea especially during the winter months to record ghost gear! Without them, this project would not have been possible.

## Further reading

Allen, R., Jarvis, D., Sayer, S., & Mills, C. (2012). Entanglement of grey seals *Halichoerus grypus* at a haul out site in Cornwall, UK. *Marine pollution bulletin*, 64 (12), 2815-2819.

Butler, J. R. (2013). A value chain analysis of ghost nets in the Arafura Sea. *Journal of Environmental Management*.

Gall, S. C., & Thompson, R. C. (2015). The impact of debris on marine life. *Marine pollution bulletin*, 92(1), 170-179.

Gray, J. S. (1997). Marine biodiversity: patterns, threats and conservation needs. *Biodiversity & Conservation*, 6(1), 153-175.

Laist, D. W. (1997). Impacts of marine debris: entanglement of marine life in marine debris including a comprehensive list of species with entanglement and ingestion records. In *Marine Debris* (pp. 99-139). Springer New York.

Laist, D. W. (1987). Overview of the biological effects of lost and discarded plastic debris in the marine environment. *Marine pollution bulletin*, 18(6), 319-326.

Macfadyen, G., Huntington, T., & Cappell, R. (2009). Abandoned, lost or otherwise discarded fishing gear (No. 523). Food and Agriculture Organization of the United Nations (FAO).

Sayer, S & Williams, K. (2015). Ghost gear in Cornwall, UK, World Animal Protection commissioned report.



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