

CleanAtlantic

Tackling Marine Litter in the Atlantic Area

Waste management of marine litter in UK ports with a special focus
on passively fished waste, net cuttings and end-of-life fishing gear

DELIVERABLE 7.2

WP7 – Tackling Marine Litter in the Atlantic Area



WP7	TACKLING MARINE LITTER IN THE ATLANTIC AREA
ACTION	<ol style="list-style-type: none"> 1. Develop a strategy and process for the study of waste management in UK ports and harbours that address a) passively fished waste (including Fishing for Litter waste), b) net cuttings and c) end-of-life nets. Included will be harbours, fishers and vessels, waste managers that participate in the FfL-scheme, amounts and characterisation of passively fished waste collected. 2. Provide guidance on the implementation of pilot projects that demonstrate solutions for improved sustainable waste pathways for marine litter and/or potential marine litter (net cuttings and end-of-life nets) in Fishing for Litter ports/harbours, aiming at the value chain of recycling, reuse and upcycling. 3. Write a report on the findings of the study.
LAST UPDATED	25/09/2023
VERSION	3
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COVER PHOTO	Fishing gear, Scarborough harbour, UK (photo M. Mannaart)

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Index

ACRONYMS AND ABBREVIATIONS	5
EXECUTIVE SUMMARY	6
ACKNOWLEDGEMENTS.....	7
INTRODUCTION.....	8
1. BACKGROUND	8
2. PURPOSE OF THE RESEARCH	8
3. STRUCTURE OF THIS REPORT.....	8
OBJECTIVES AND RESEARCH METHODOLOGY	9
1. INTRODUCTION	9
2. PROBLEM DEFINITION AND RESEARCH OBJECTIVES.....	9
3. RESEARCH METHODOLOGY.....	9
3.1 The organisational framework.....	10
3.2 Data collection and processing	10
3.3 Development and implementation of pilots.....	12
WASTE MANAGEMENT OF MARINE LITTER IN UK PORTS	13
1. INTRODUCTION	13
1. SUSTAINABLE WASTE MANAGEMENT PRACTICES	16
2.1 Introduction	16
2.2 The collection, storage and processing of the different waste types.....	16
2.3 Requirements and challenges	19
BEST PRACTICES AND PILOTS	20
1. INTRODUCTION	20
2. BEST PRACTICES	20
2.1 Journey Blue Net Collect	20
2.2 Ørsted collection of ropes, nets and buoys.....	22
3 THE PILOTS	23
3.1 Plastic@Bay.....	23
3.2 Yorkshire Wildlife Trust.....	27
KEY FINDINGS.....	30

1. KEY FINDINGS OF WASTE MANAGEMENT PRACTICES IN PORTS	30
2. KEY FINDINGS OF BEST PRACTICES AND PILOTS ON IMPROVED SUSTAINABLE WASTE PATHWAYS FOR MARINE LITTER AND/OR POTENTIAL MARINE LITTER.....	30
CONCLUSIONS AND RECOMMENDATIONS	32
1 INTRODUCTION	32
1.1 Survey	32
1.2 Best practices and pilots	32
2 CONCLUSIONS	32
2.1 Answers to the research questions	32
3 RECOMMENDATIONS.....	36
2.1 General recommendations	36
2.2 Recommendations to pilot projects for optimizing waste processing.....	36
REFERENCES.....	38
ANNEXES	39
1. ANNEX I.A LIST OF REPRESENTATIVES OF PORTS AND HARBOURS THAT WERE CONTACTED FOR FILLING OUT THE SURVEY	40
2. ANNEX I.B OVERVIEW OF SURVEY QUESTIONS	44
3. ANNEX I.C OUTCOMES OF THE SURVEY	46
4. ANNEX II.A OVERVIEW OF PORTS AND HARBOURS PARTICIPATING IN THE FISHING FOR LITTER PROGRAMME	50
5. ANNEX II.B. OVERVIEW OF PORTS AND HARBOURS PARTICIPATING IN AN END-OF-LIFE NET AND NET CUTTINGS COLLECTION & RECYCLING SCHEME AND/OR OTHER RECYCLING SCHEMES.....	52
6. ANNEX III.A LIST OF INTERVIEWEES OF MARINE LITTER PROCESSING PROJECTS.....	53
7. ANNEX III.B OUTCOMES OF THE ASSESSMENT OF MARINE LITTER PROCESSING PROJECTS	54

Acronyms and abbreviations

Acronym/Abbreviation	Explanation
ALDFG	Abandoned, Lost, or otherwise Discarded Fishing Gear
EOLFG	End-of-Life Fishing Gear
EU / EC	European Union / European Commission
FfL	Fishing for Litter (waste)
HELCOM	Helsinki Convention, regional sea convention on the Baltic Sea
KIMO	Kommunenenes International Miljøorganisation (Local Authorities International Environmental Organisation)
MARPOL	The International Convention for the Prevention of Pollution from Ships (MARPOL Convention)
MSFD	Marine Strategy Framework Directive
OSPAR	Oslo-Paris Convention, regional sea convention on the NE Atlantic Ocean
PFW	Passively fished waste
UN	United Nations
UNCLOS	UN Convention on the Law of the Sea
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WFD	EU Water Framework Directive
WD	EU Waste Directive

Executive Summary

Background

The issue of pollution from fisheries waste needs to be addressed. Nets, cuttings from net repair, ropes, buoys, cords, creels and other fisheries items, found in abundance on shores and in the marine environment, cause harm to marine wildlife through ingestion and entanglement and to the fishing industry through damage to fishing gear. Simple, effective solutions can be implemented by fishers and port authorities to collect this waste and to manage it sustainably, creating new products from old within a circular economy. Mitigation requires awareness raising within the industry and engagement by fishers and harbour authorities to modify existing work practices and use methods and tools to better manage fisheries waste sustainably.

As part of the Interreg Atlantic Area CleanAtlantic project, KIMO International conducted a survey of harbour authorities within the UK in order to explore challenges and solutions to dealing with these types of waste and to identify best practices and projects that exemplify sustainable and circular waste management.

This report presents an analysis of the results of the survey and feedback obtained through face-to-face interviews. Information was gathered about current waste management practices and about initiatives seeking to improve recycling rates and valorize the fisheries litter by turning marine plastic waste into commercial products or feedstock. Harbour staff and authorities contributed valuable information about current waste management practices and attitudes towards implementing more sustainable waste management practices. Key findings of waste management practices in ports and best practices/pilots on sustainable waste pathways are given, and recommendations for next steps are provided.

Acknowledgements

The implementation of this project would not have been possible without the support of people working on marine issues in the United Kingdom. Those who took the time and filled out the questionnaire, feeding one of the main pillars of this research with information, are thanked for their efforts. The insight provided personally by people working on waste management, and particularly on marine Litter and its collection and recycling on the ground was of major importance. Special thanks goes to those who provided information during interviews, including: James Buck and Chris Burrows (Scarborough Harbour), Ana Cowie of Yorkshire Wildlife Trust), Joan D'Arcy Ph.D. (Plastic@Bay), Andrew Earle (Marine Management Organisation, Scarborough Office), Nick Garter (Ørsted), Julia Cant (KIMO UK's Fishing for Litter Coordinator), Alistair Lawson (Journey Blue), Julien Moreau (Plastic@Bay), Lindsey Newlyn (Marine Management Organisation, Scarborough Office), Captain Paul Pedersen (Ørsted) and Lawrence Porter (Harbour Superintendent of Bridlington Harbour). For support with the survey, Grioghair McCord (KIMO International) is thanked.

Introduction

1. Background

Plastic litter in rivers and the ocean is a major environmental problem requiring rapid and effective solutions, and this was the ambition of the CleanAtlantic project. The project aims to protect biodiversity and ecosystem services in the Atlantic Area by improving capabilities to monitor, prevent and remove (macro) marine litter. The project, which is co-financed by the European Regional Development Fund through the Interreg Atlantic Area Programme, also contributes to raising awareness and changing attitudes among stakeholders and to improving marine litter management systems. The main objectives of the project are:

1. To draw a picture of current situation, existing knowledge, data and initiatives in the Atlantic regions and definition of gaps.
2. To review current systems to monitor and record marine litter and to deliver protocols, tools and indicators to fill monitoring needs.
3. To develop modelling tools to predict the origin, circulation, and fate of marine litter, and elaboration of regional maps of hotspots of accumulation using models, remote sensing technologies, and aerial, surface and underwater unmanned systems.
4. To address prevention by developing best practices to reduce inputs from fishing and port sectors.
5. To tackle removal of marine litter by implementing initiatives of fishing for litter, to reduce the presence of “abandoned lost and otherwise discarded fishing gears” on the sea-bed, and to develop best practices for routine beach litter clean-up by local authorities.
6. To deliver training and awareness activities addressed to various audiences and to transfer project outputs to competent authorities and key stakeholders to improve management and facilitate MSFD (Marine Strategy Framework Directive) implementation (CleanAtlantic, 2023a)

KIMO International joined the CleanAtlantic project as a full partner in November 2021 and used our experience with fishing gear and marine litter collection to focus on finding ways to improve integrated waste management of passively fished waste, net cuttings and end-of-life-fishing gear.

2. Purpose of the research

Marine litter is composed of diverse types of waste originating from many sources including from the fishing and mariculture industries. Harbours and ports¹ need to find ways to sustainably manage waste from fisheries as well as marine litter from non-specific sources. In order to address this, dedicated research was undertaken on fisheries waste management practices in UK harbours. Additionally assessed was whether and where there were activities or projects outside of harbours that had also found solutions for sustainably managing marine litter.

3. Structure of this report

A general introduction and background form the first part, followed by a section laying out the objectives and research methodology. Section 3 covers the waste management structures of UK ports. It deals with the different types of fisheries waste collected, stored and processed in port. Section 4 describes opportunities for optimizing the processing of marine waste streams. The final part of the report offers conclusions and recommendations. References and annexes are given at the end.

¹ In the text, the terms ports and harbours are used interchangeably

Objectives and research methodology

1. Introduction

It has been well documented that marine litter is widespread and present in extensive amounts. The sources of plastic marine litter are diverse, and can be land-based, riverine, sea-based and even airborne (Mannaart et al, 2019). Much of the waste that ends up into the oceans is land based and transported to the oceans via rivers and waterways (Lebreton, 2017). While steps are being taken globally to address the problem (United Nations, 2022b), there is no easy solution. In Europe, legislation with actions is in place to address this challenge, including the EU's Single Use Plastics Directive (EU, 2019a) and Port Reception Facilities Directive (EU, 2019b) and from the implementation side of collection at sea, the Fishing for Litter scheme (Mannaart & Bentley, 2022) and other passively fished waste collection activities.

However, not all litter comes from land or via rivers. Some originates from activities at sea or on the shore, primarily by the fisheries industry. This waste includes abandoned, lost, or discarded fishing gear (ALDFG or ghost gear) and end-of-life fishing gear (EOLFG). It can include complete nets, cuttings from net repair lost or discarded during maintenance activities, ropes, buoys and dolly rope (used in trawl fishing). It is estimated that lost or discarded gear makes up at least 10% of marine litter. This implies that between 500,000 and 1 million tonnes of fishing gear is lost or intentionally dumped into the oceans annually (Macfadyen & Huntington, 2009; Jambeck et al, 2015, WWF, 2020). Gear from fishing and shipping form 46% of the 45,000 to 129,000 tonnes of plastic present in the North Pacific Garbage Patch (Lebreton, 2017). Mitigation requires awareness raising within the industry and engagement by fishers and harbour authorities.

2. Problem definition and research objectives

How could sustainable collection and use of fishing gear be implemented in order to limit the production of marine litter in the United Kingdom? The objectives of the research described in this report include therefore:

1. Develop a strategy and process for the study of waste management cases and structures in UK ports and harbours that addresses a) passively fished waste (including Fishing for Litter waste), b) net cuttings and c) end-of-life nets. Included will be harbours, fishers and vessels that participate in the FfL scheme, amounts and characterisation of passively fished waste that was collected;
2. Design and provision of guidance on the implementation of pilot projects that demonstrate solutions for improved sustainable waste pathways for marine litter and/or potential marine litter (net cuttings and end-of-life nets) in Fishing for Litter harbours, aiming at the value chain of recycling, reuse and upcycling.
3. Write a report on the findings of the study that includes a description of the work done and guidance on implementation of best practices. The report should offer recommendations to relevant stakeholders and policy makers on improving and optimizing sustainable integrated waste management of certain waste streams.

3. Research methodology

The general approach of the research is composed of three main elements:

1. Establishment of the organisational framework
2. Data collection and processing
3. Development and implementation of pilots

3.1 The organisational framework

For this research, three main groups of tasks had to be covered: (i) project management and drafting of the report; (ii) literature review and field research and (iii) liaising with the fishing industry and ports. Mr. Michael Mannaart *MSc*, Executive Secretary of the independent association KIMO the Netherlands and Belgium was subcontracted for the role of project manager, for design of the research strategy, conducting a literature review and as lead author of the report. Ms. Rebekah Morris *MSc* (graduate intern) acted as research officer for assisting with literature review, conducting interviews and assisting with field research. Ms. Arabelle Bentley *MSc*, Executive Secretary of KIMO International provided advice on the research strategy and final editorial input. Ms. Julia Cant, Coordinator of KIMO UK's Fishing for Litter scheme, liaised with the fisheries sector and ports in the UK.

3.2 Data collection and processing

3.2.1 Research questions addressed

The research questions focused on three types of fisheries waste:

1. Fishing for Litter waste (passively fished waste)
2. Net cuttings (generated from net repairs at sea or in port)
3. End-of-life nets

It was important to assess handling of these waste types in harbours in order to (i) determine whether there were best practices in place regarding waste landing and storage; (ii) identify what were the factors that enabled successful development of best practices in some harbours that were not necessarily relevant in others; (iii) identify where there were opportunities for the development of pilot schemes that could address these waste types. The research questions developed are listed below.

Organisational aspects

1. Which ports and harbours participate in UK's FfL scheme?
2. Which ports and harbours address net cuttings and end-of life nets?
3. Who are the contacts with the port authorities - harbourmaster, port waste manager, waste collectors/processors, fishers (fishing associations/fish auctions) and other important stakeholders, of each of the ports/harbours that participate in the scheme?
4. How many and what type of vessels (fishing technique) participate in UK's FfL scheme (linked to participating ports/harbours)?

Landing and storage of passively fished waste (FfL waste) at ports

1. What types (characterisation) and amounts of passively fished waste are landed at each of the participating ports?
2. Is passively fished waste also landed at ports/harbours that do not participate in the scheme that we know of?
3. Are vessels that are not registered for FfL allowed to deposit passively fished waste in the FfL skips in port?
4. Do harbour staff check to see if a vessel that wants to land passively fished waste is part of the FfL scheme?
5. If collected, how is FfL waste landed, stored, transported and processed or disposed-of at each of the participating ports/harbours? (insight in the waste value chain)?
6. If FfL waste is landed, how much (what proportion) of the waste is recycled, how much goes to landfill, incineration or other processing options?

7. What are the requirements (practically, technically, organizationally, legally or otherwise) for ports/harbours to process/repurpose passively fished waste?
8. What are the limiting factors for the implementation of FfL management?

The extra mile: addressing net cuttings and end-of life nets

1. If collected, how are net cuttings and/or end-of-life nets landed, stored, transported and processed or disposed-of, at each of the participating ports/harbours? (insight in the waste value chain)?
2. If collected, what costs are associated with landing, storage, transportation and processing or disposing of net cuttings and/or end-of-life nets at each of the participating ports/harbours?
3. Are net cuttings and end-of life nets being treated as separate waste streams in ports?
4. If collected but not treated separately, what is done with net cuttings and end-of life nets in ports?
5. What ports and harbours that do not currently address net cuttings and end-of life nets might be willing to adopt this and make that a success?
6. What are the requirements (practically, technically, legally or otherwise) for ports/harbours to process/repurpose net cuttings and end-of life gear?
7. What are the limiting factors for the implementation of net cuttings and end-of-life nets' management?

Recycling of marine litter

1. At the ports/harbours that participate in one or more marine litter schemes (FfL, net cuttings and end-of-life nets), are these types of waste also processed sustainably and/or repurposed?
2. Where FfL, net cuttings and end-of-life nets are processed sustainably and/or repurposed, where is that done (e.g. private business, public facility)?
3. What are cost implications of each (transportation costs, other logistics).
4. Which of the three waste streams is/are recycled and/or repurposed?
5. Which part of the particular waste stream(s) is recycled and/or repurposed?
6. What products are made out of these waste streams?

Best practices

1. At what ports are there best practices for the management (from collection, storage, transportation and repurposing) of net cuttings, end-of-life nets and FfL waste?
2. Which organisations are involved in the value chain of those best practices?
3. What are the driving factors of those best practices?
4. What are the main challenges to overcome for those best practices?
5. What are the driving organisations of those best practices?
6. What are the contact points of those organisations?

Pilot opportunities

1. Which ports could serve as pilot locations for the management of marine litter collection, storage and recycling?
2. Which of the three waste types (or an integrated approach to include all three types) could be addressed there?

3.2.2 Data collection, its storage and processing

The collection of data was done by means of surveys and interviews that address the questions presented in the section above. Those questions needed to be further elaborated to fit well in a list of questions of an interview format. Where possible, questions needed to be closed, to make data processing and comprehension easier. To enable collecting information, the right stakeholders needed to be contacted. For

this purpose, internal discussions with KIMO UK's team members who are involved in Fishing for Litter took place. As a result, information on harbours and their stakeholders that participate in the Fishing for Litter scheme was acquired. As a next step, the key stakeholders were identified and contacted, and the surveys sent. The information was stored in spreadsheets, which suited the research methodology well.

Of the 138 ports and harbours contacted for the survey, 16.67% (23) replied either by email or over the phone. The proportion of questions answered greatly varied, probably due to the large variation in port/harbour size and/or relevancy being dependent on whether ports/harbours had a large or small number of fishing boats. Refer to Annex I.a for the ports that were contacted to fill out the survey. Annex I.b. presents an overview of the survey questions and Annex I.c the outcomes of the survey. Annex II provides an overview of ports and harbours participating in a marine litter prevention, collection and recycling scheme. Annex III.a presents a list of interviewees of marine litter processing pilots, and Annex III.b gives the outcomes of the assessment of marine litter processing pilots.

3.3 Development and implementation of pilots

With the input from the interviews, locations that were suitable for running pilots were identified and stakeholders contacted to ascertain whether running a pilot scheme was feasible for them. Although a number of suitable ports and initiatives were identified, getting them engaged was challenging, with some stakeholders being initially reluctant to share data or to cooperate. However, stakeholders from Plastic@Bay were keen to participate in a pilot that would address net cuttings and end-of-life creels, which is described in Chapter 4 of this report. A decision was also made to visit a region with a number of identified initiatives (past and present) that focused on the collection and processing of marine litter (particularly fishing gear), to assess and discuss opportunities with stakeholders in the field. The selected geographical scope was the area around the Humber Estuary in England. Visits were made (from south to north) to the harbours of Grimsby, Hull, Bridlington, Scarborough and Whitby. Interviews were held with Harbourmasters at Bridlington, Scarborough and Whitby. Furthermore, representatives of marine litter projects were met and marine litter storage facilities visited, including Journey Blue's Net Collect programme in Whitby and Scarborough, Ørsted's Fishing for Litter project in Grimsby, Yorkshire Wildlife Trust's Fishing for Litter project in Bridlington and Scarborough and the Yorkshire Wildlife Trust's Living Seas Centre at Flamborough. The visit was conducted from 26 February until 4 March 2023 and its input was fruitful, as is described in detail in Chapter 4 of this report.

Waste management of marine litter in UK ports

1. Introduction

The collection of passively fished waste in UK harbours is widespread. Of the ports that responded to the survey, 38% indicated they were involved with the Fishing for Litter scheme. At the time of writing (March 2023), the number of harbours that participate in UK's Fishing for Litter scheme is 57, 31 in England and 26 in Scotland (refer to annex II.a).



Photo 1. Fishing for Litter skip with Harbourmasters and KIMO staff and associates in Lerwick Harbour, Shetland during the national FfL-scheme's 10th anniversary in September 2022 (photo KIMO).

5 ports that responded to the survey indicated that they participate in an end-of-life net and net cuttings collection & recycling scheme and/or other recycling schemes. Of these, 3 deal with end-of-life nets, 3 with net cuttings (those are the same as end-of-life nets) and 2 apply other recycling schemes (refer to annex II.b). A field visit was conducted to assess the situation in English harbours around the Humber Estuary in the area comprising Grimsby in the south to Whitby in the north. It became clear that a large part of the pelagic fleet has gone from this region.

"The fishing industry on the Humber (Grimsby and Hull) was probably at its peak in the mid to late 1950s with vessels fishing the grand banks, Greenland, Iceland, North Norway and Svalbard to name some. The Industry had its first setback '59 to early 60's with the Icelandic Cod wars. The fleets were decimated" (info

received from Nick Garside, 12/04/23). In Grimsby as an example, the fleet declined from about 150 fishing vessels to approximately only 20 now. The fish markets and many of the shops, banks and restaurants in the harbour area are now all derelict (Interview with N. Garside and P. Pedersen, 27/02/23). The results of this decline could be observed in the former fishing port of Hull (refer to photo 2).



Photo 2. Derelict buildings at the Dock Gates, St Andrew's Dock, Hull (photos M. Mannaart).



Photo 3. Captain Pedersen inspects a big bag with ropes and buoys at his guard ship, Grimsby harbour (photo M. Mannaart).

Activities in some harbours have changed and now wind farms are being constructed at sea which offers new opportunities and leads to a revitalization of ports where power companies redevelop quaysides. During construction of wind farms, those sites need to be guarded. A part of the fishing fleet decided to change their ships into guard vessels for this purpose. Other fishers changed their operations from catching white fish to collecting scallops or “potting” also known as “creeling”, the catch of crabs and lobsters by using pots (refer to photos 4 and 5). This change occurred the last 2 decades in Grimsby (source: interview with Nick Garside and Paul Pederson, Grimsby, 27 February 2023). Due to these developments, a large portion of the fishing gear observed in the ports are crab pots.



Figure 4. Crab pots ready for use in the Whitby harbour (photo M. Mannaart).



Photo 5. Preparing a new crab pot in the Bridlington harbour (photo M. Mannaart).

1. Sustainable waste management practices

2.1 Introduction

In the United Kingdom, waste from the fishing industry is usually collected and stored at port reception facilities. In all ports assessed, port reception facilities were present, the type and size being largely dependent on the size of the port. Collection of oily waste, domestic waste, end-of-life fishing gear such as nets and crab and lobster pots, and other waste is organised. However, usage of the facilities is not necessarily consistent. In some ports, where facilities are provided for the collection of derelict crab and lobster pots, or of passively fished waste, these are not always used (interview with Chris Burrows and James Buck, 3 March 2023).

2.2 The collection, storage and processing of the different waste types

This section describes the handling of two types of waste at port; 1. passively fished waste (PFW) which is called Fishing for Litter (FfL) waste when the ship participates in the FfL scheme and 2. net cuttings and end-of-life fishing gear. The information presented was collected by means of the survey sent (refer for an overview to survey results in annex I.b). Additional information was gained from face-to-face interviews. Where sources other than the survey are relevant, this is indicated at the end of the specific section.

2.2.1 Passively fished waste (including Fishing for Litter waste)

Around 30% of the harbours surveyed participate in a Fishing for Litter project – this compares with the 38% of total UK harbours that participate in the scheme. Of those that were not involved in Fishing for Litter, a further 31% of harbours collect passively fished waste at some level.

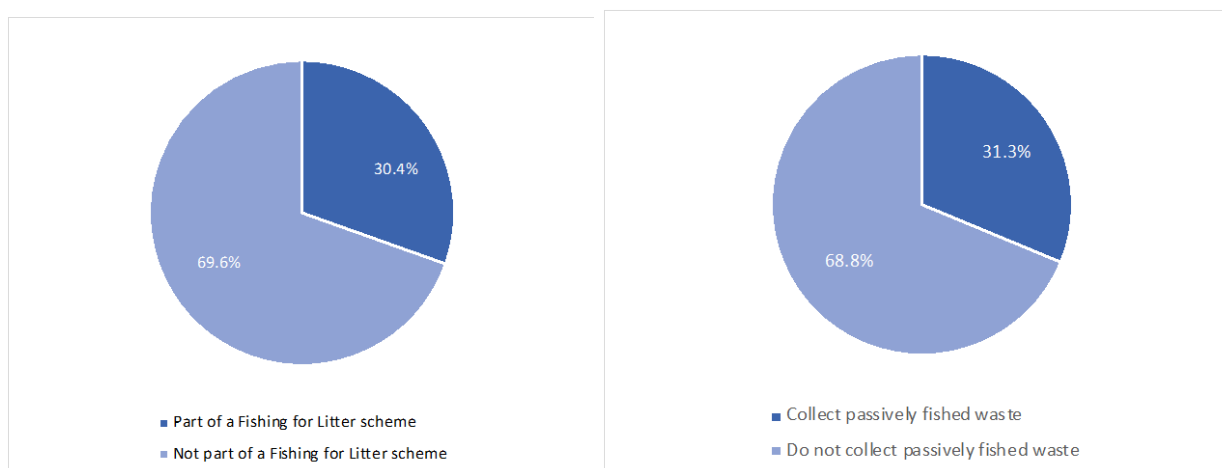


Figure 1.a (l) Percentage of ports that participate in a fishing for litter scheme. **Figure 1.b (r)** The percentage of ports that participate in the collection of passively fished waste in any capacity.

The average number of fishing vessels at each harbour that participates in the scheme was 14. The numbers across all harbours that responded ranged from 3 to 56. The percentage of types involved was: Creelers/Potters: 32,6%, Trawlers 21,4%, other 20,3%, Gill Netters 11,6, Liners 7,9%, Trap Setters 4,4% and Dredgers 1,8%. The majority were potters/creel boats, which utilise crab and lobster pots in inshore fishing areas. This was followed by Trawlers and then Gill Netters. These are larger vessels that generally go further offshore. There is little opportunity for the potters/creel boats to collect passively fished waste. Harbours did not specify how many vessels participate in the FfL scheme (refer to survey results, annex I.b).

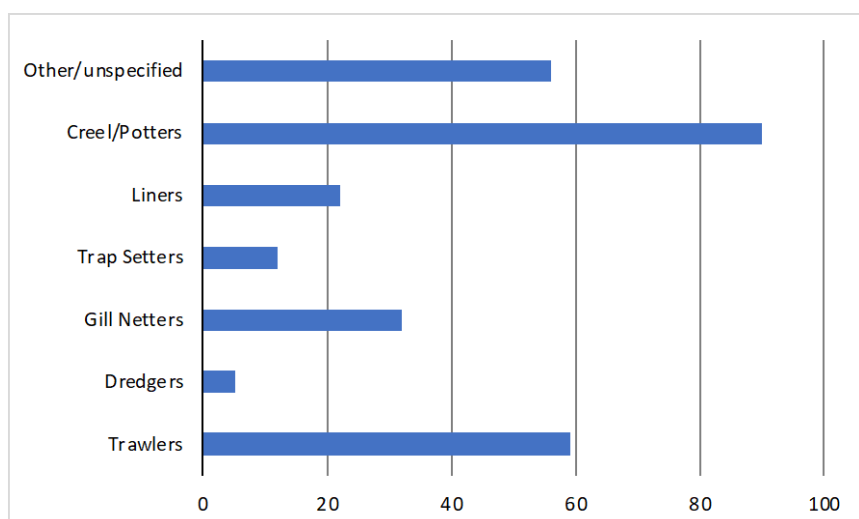


Figure 2. Percentage of vessel types that participate in the FfL scheme

Vessels that are not registered for FfL catch passively fished waste and some want to deposit that in the FfL skips in port. The survey asked harbours if this was allowed. Of the 9 responses to this question, 7 said that non-registered vessels were permitted to deposit PFW in the FfL skips. Vessels that are not registered for FfL sometimes want to deposit other waste (such as ship generated) in the FfL skips in port. Harbours were asked if this was allowed. Of the 9 responses to this question, 7 said that vessels were not allowed to deposit other waste into the FfL skips at the port.

Of vessels that want to land passively fished waste, the survey asked whether harbour staff check to see if the vessel is part of the FfL scheme. Of the 9 responses to this question, 6 said that the vessels are checked as being a part of the FfL scheme before they land the PFW.

What is done with FfL or PFW at port? All of the harbours that collected PFW had skips or, in a few cases, a large bin on the quayside that fishers could use for PFW. This is then removed and dealt with by a number of different waste management companies, the local council or, in one instance, a private initiative - Odyssey Innovation - recycles the waste. Once the waste is removed, the harbours on the whole are unaware of its final destination, though most assumed it goes to landfill.

The survey asked what proportion of the FfL or PFW that is landed is sustainably processed. As previously stated, once removed from the harbour premises, harbour staff seemed unaware of what was done with the waste. The exceptions to this are where there are specific projects that target these types of waste, for example Journey Blue net collect (described later on in this report).

2.2.2 End of life fishing gear and net cuttings

Apart from passively fished waste, a number of the ships also land net cuttings and end-of-life fishing gear. Are these net cuttings and end-of-life nets being treated as separate waste streams in port? The answer to this question is that there are a number of discrete management processes used to deal with net cuttings and end-of-life nets, but where net cuttings and end-of-life nets were collected, they were generally treated as a single waste stream.



Photo 6. Fish nets stored at Scalloway harbour, Shetland Islands (photo M. Mannaart).

If collected and landed how are net cuttings and/or end-of-life nets at port dealt with and are they recycled or repurposed? Around 52% of the ports and harbours had a system for disposing of end-of-life nets and net cuttings. In 26% of cases, ports treat this type of waste as a separate waste stream. 22% of the ports (5) indicated that they participate in an end-of-life net and net cuttings collection & recycling scheme and/or other recycling schemes. However, in more than 75% of the cases this meant that the net waste could be added to PFW skips, general waste skips or FfL skips.

Out of the 23 harbours that responded, two have their net cuttings and end-of-life nets processed by Odyssey Innovation and one by Ocean Plastic Pots. These are organisations known to recycle the end-of-life nets and net cuttings and turn them into commercial products such as kayaks, picnic benches, plant pots and even bins for collecting passively fished waste – a neat solution! One of the ports used an undisclosed marine waste recycling facility. Around 40% of the harbours do not provide any separate facilities for net cuttings and/or end of life nets, often when there are only a smaller number of fishing vessels in the harbour or the fishing fleet is mainly potters/creel fishers. 43.5% of the harbours use a local or national waste management company that will dispose of the net cuttings/end-of-life nets along with the harbour waste or PFW. This includes one harbour that collects end-of-life nets individually and drops them off at a council skip at one of the larger harbours.

It was assumed by the majority of harbours that the net cuttings and end of life nets collected by the waste management companies would be disposed of in landfill, although they were not certain. In cases where net cuttings and end-of-life nets are processed sustainably and/or repurposed, where is that done? In response to that question, only two companies were mentioned, Odyssey Innovation and Ocean Plastic Pots. In addition, the interviews revealed that also Journey Blue Net Collect collects derelict fishing gear in port

(interview with Alistair Lawson on 01/03/23; and Chris Burrows and James Buck on 03/03/23), Ørsted-sponsored Fishing for Litter projects collect ropes, fishing gear and buoys at sea (interview with Nick Garside and Paul Pedersen, 27/02/23), and Plastic@Bay collects derelict fishing gear on beaches (interview with Julien Moreau and Joan d’Arcy, 23/01/2323).

The costs associated with waste are often a challenge, therefore the survey asked about the costs associated with landing, storage, transportation and processing or disposing of net cuttings and/or end-of-life nets and FfL waste at port. Many harbours did not have the breakdown of how the waste costs were divided. Those that had an arrangement with an organisation such as Odyssey Innovation did not pay for the costs of disposing net cuttings and/or end-of-life nets. The harbours that did list costs indicated that those ranged from £280 per tonne to get rid of old abandoned nets, to £500 per skip uptake, to approximately £2,600 per annum which included staff time and receptacles. FfL provide skips at no cost to the fishers or harbours, however in several instances the harbour contributes financially.

2.3 Requirements and challenges

In order to collect, store and process waste, ports may be required to comply with certain requirements, but what are the requirements (practically, technically, legally or otherwise) for the port to process/repurpose passively fished waste, net cuttings and end-of life gear? Legally, it seems there is no obligation for harbours to process/repurpose passively fished waste, net cuttings and end-of life gear. Practically, doing so requires extra space, waste receptacles such as skips, bins and in the case of PFW, big bags to go on board the vessels.

What are the limiting factors in collecting and processing passively fished waste, net cuttings and end-of life gear? The biggest limiting factor is the lack of recycling facilities in the UK. There was a general willingness and desire to look at recycling options but a lack of facilities that would take marine waste as it often degraded, biofouled and difficult to clean, and the processing of it is challenging, taking up staff time, and space in port and on the quayside. Even in the case that there were recycling facilities, the costs and logistics of transportation meant that it was unviable.

In the harbours, several respondents commented on a lack of space for the bins and skips, alongside the associated costs with dealing with the waste. Some historical harbours have limited commercial incomings, with one port saying that they are a Grade A listed structure and any money made from berthing is spent on maintaining the harbour and its fittings, and pontoons, a sluice/lock gate and bridge. Abuse of the facilities was also an issue that was raised. In one harbour, fishers were not abiding by the requests of the recycling organisation, to the point that the recycling organisation decided to stop removing old nets and net cuttings from this particular harbour. Another harbour expressed issues with leisure vessels and even some of the public using PFW skips for general waste. Smaller ports and harbours generally have fewer fishing vessels and these are more likely to be creel/potters. In these cases, the harbours believe they do not collect enough PFW, net cuttings or end of life fishing nets to make collection worth it. The also pointed out a lack of recycling options for lobster and crab pots.

What best practices are present for the management (from collection, storage, transportation and repurposing) of net cuttings, end-of-life nets and passively fished waste? The larger ports have waste management plans, and it was recognised that safe storage and a separation of different materials were generally considered best practice. Odyssey Innovation has collection requirements for the ports that participate, however these were not detailed. One port commented on the lack of specific guidelines for the waste management of net cuttings, end-of-life nets and passively fished waste.

Best practices may overcome the main challenges of waste management but the answers are not always straightforward. For example, many harbours say that the fishers have expressed a strong interest in removing waste from the sea, but that funding and resources are lacking. Other harbours report that there are sometimes issues with fishers who do not abide by the guidelines, putting their waste in the wrong bins.

Best practices and pilots

1. Introduction

KIMO has gained extensive knowledge on marine litter collection and its processing through its Fishing for Litter scheme and both of the research team members were involved in implementation of Fishing for Litter in the United Kingdom and the Netherlands and had good general insight into the questions that needed to be addressed, in particular:

- what quantities of litter are present ;
- what costs are associated with collection, storage, transport and recycling of the waste ;
- what part of the waste can be processed sustainably, recycled or repurposed ;
- what kind of products could be made out of it ;
- what types of funding and business models are present and/or required ;
- what partners might be needed ;
- what legal challenges might be encountered during the process.

This experience helped greatly with assessing best practices and pilots focused on initiatives that dealt with the collection and processing of end-of-life fishing gear (EOLFG) and abandoned, lost, or discarded fishing gear (ALDFG), including net cuttings.

After literature review, Internet search and contacting of harbours, a number of marine litter collection and recycling initiatives were identified and contacted, including Journey Blue Net Collect, Ocean Plastic Pots, Odyssey Innovation, Ørsted's scheme for the collection of ropes, nets and buoys, Plastic@Bay, Refactory and Yorkshire Wildlife Trust's marine litter initiative. Some of these were willing to share information, and this was facilitated by a personal visit to the Humber area where representatives of Journey Blue Net Collect and Ørsted's initiative were met and interviewed. Two initiatives were willing to start up projects (Plastic@Bay and Yorkshire Wildlife Trust) for which support was provided through the CleanAtlantic project. Those two best practices and the two pilots are presented in the next sections.

2. Best Practices

2.1 Journey Blue Net Collect

2.1.1 Types of waste and its processing

Journey Blue Net Collect collects old ropes, nets and net cuttings from Whitby and Scarborough harbours. The end-of-life gear is dropped off to and stored in locked shipping containers on the quayside – the key can be collected from the harbourmaster by the fishers to access the container. Once the shipping container is close to being full, the waste requires being sorted and picked for transport. This is done approximately once a year, taking a day to take it out the shipping containers and sort it including removing the twine securing sections of the ropes and nets. In the last year and a half that the project has been running, they collected around 6-8 tonnes, of which 4-5 were recycled. Any of the waste that cannot be recycled is disposed of in a council skip. It is then packed into a van and driven to a processing centre in the Bourton-on-the-Water. The waste is then recycled into pellets and fed back into production for example at Milspeed Ltd. This helps create a circular economy. Journey Blue Net Collect receives help and support from Keep Britain Tidy's Ocean Recovery project, arranging the transportation from the harbours to the processing centre.



Photo 7. Journey Blue's net storage container in the port of Scarborough (Photos by Journey Blue®)



Photo 8.a. (l) Inspection of the container's contents at port. **Photo 8.b** (r) products made from the collected waste (Photos by Journey Blue®)

2.1.3 Support from ports/harbours

Harbours are generally receptive to the project, with the harbourmaster in Whitby and Scarborough supporting the project. The project deals with a waste stream for the harbours, meaning they do not have to arrange and pay for a waste management company to deal with the nets resulting in it being an appealing project to be a part of.

2.1.4 Main challenges and limiting factors

Whilst the costs of transporting the waste are supported through Keep Britain Tidy, the initial start-up costs in a port are around £2500 to buy, paint and brand one the shipping containers. Therefore, expansion is limited by this cost. The processing that needs to be carried out before transportation takes about a day to do with around 3 volunteers. Again, any scaling up the project would require an increase in volunteers local to the port/harbour.

2.1.5 Future Expansion

There are already ongoing conversations to add a third harbour into the project. There is the possibility of a company in Leeds looking at donating old shipping containers to enable development of the project. Long term, the project wants to continue expanding into other harbours, with a particular focus on the UK's east coast where the project is currently based. There is a desire not only to look at recycling, but also to change behaviour so that there is a reduction in overall waste. This feeds into the other aspect of Journey Blue which is their e-commerce site selling sustainable products (interview with Alistair Lawson, 01/03/23).

2.2 Ørsted collection of ropes, nets and buoys

Ørsted is a large renewable energy company that works internationally and facilitates the collection of marine litter at the marine wind farm construction projects in the UK, including marine locations Hornsea I, II and IV. The collection of litter is done by the crew of guard vessels that guard construction sites of windfarms or locations where trenches for cables are dug out at sea. The guard boats have to wait during their duty, and collect floating litter during that time. The litter is stored in a big bag of the type that is also handed out for the UK Fishing for Litter scheme. An estimated half a tonne of litter is collected annually in Scarborough, where it is placed into a skip. The skip is placed behind a fence that is only accessible to Ørsted staff. Skippers and crew of all (potential) guard vessels are contacted and leaflets on the project are handed out to acquire more vessels.

2.2.1 Types of waste and its processing

The waste comprises largely of buoys and ropes. Buoys and ropes in good condition and waste with a marker attached are returned to the fishers for reuse. The size of the participating fleet of guard vessels is about 14, which are mostly former fishing boats. The waste management is paid for by Ørsted and KIMO's Fishing for Litter scheme.

2.2.2 Main challenges and limiting factors and opportunities for future expansion

Main challenges perceived include coordination of and communication with the participating vessels and the need to increase the number of guard vessels. There is however, a large number of ships (fishing vessels) present that could be utilised (interview with Nick Garside and Paul Pedersen, 27/02/23).



Photo 9.a (l) A guard ship in Grimsby harbour and **9.b** (r) waste collected at sea (Photos M. Mannaart)

3 The Pilots

3.1 Plastic@Bay

Plastic@Bay is a not-for-profit organisation and operates within a Circular Economy Framework, whereby plastic destined to reside in the ocean is recycled into products for resale, profits directed back into the company to fund beach cleaning activities. Plastic@Bay have made a recent move from Durness in the north of mainland Scotland, to the Isle of Lewis, part of the Western Isles. The organisation is still in the process of establishing in Lewis.

3.1.1 Types of waste

In Durness, the focus of the project was beach cleans - approx. 30-50 tonnes of litter was collected from beach cleans over six years. To get a clearer picture of sources and quantities of waste washing ashore, Plastic@Bay monitored and surveyed Balnakeil Bay, Durness over a five-year period. On average, one and a half tonnes of waste was removed from this bay annually. One surveying campaign over a six-month period in 2021 (Figure 3) showed that 70% of the waste washing ashore was plastic and 30% was webbing associated with military manoeuvres by the Ministry of Defence on Cape Wrath, adjacent to Durness.

3.1.2 Processing the waste

The pollution collected from the coast is transported using an off-road vehicle and a van. The waste is sorted and cleaned for processing at Plastic Lab, Durness, Plastic@Bay's recycling workshop. Larger ropes and nets are sorted out in the open at an old military bunker, where they are unravelled and hung on sieving shelves to allow the rain and wind to wash off excess debris such as sand. The sun removes most organic material in the process too. Material of the wrong polymers (foams, thermoset plastics, PVC, rubber) or too

contaminated (oil, biofouling) to be recycled is sent to landfill. At Plastic Lab, Plastic@Bay mechanically recycles polyolefins, polypropylene (PP) and polyethylene (PE). Including marine ropes (PP/PE mix), PE trawl nets, and large hard plastic such as HPDE fish farm feeder pipes, fish boxes and oil drums. The workshop consists of a small industrial shredder, and a variety of low-tech plastic recycling machines, including a compression oven, injection machine and extruder, and specialized tools adapted to processing ocean plastic. The crude cleaning methods can leave some impurities compared to industrial cleaning methods, meaning the granulate may not be suitable for high-speed precision moulding, but it is perfectly adequate for the low-tech machinery developed by Plastic@Bay.

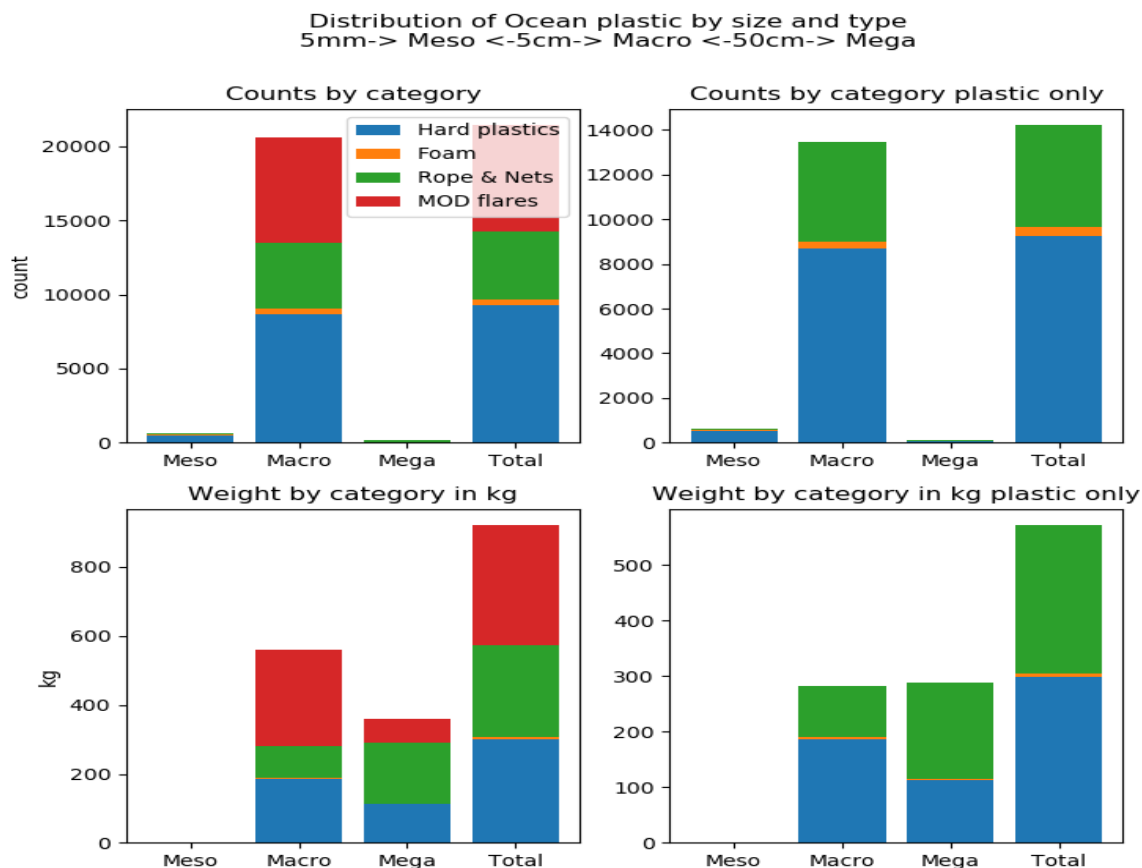


Figure 3. Statistics of monitoring 79 beach cleans made in the Durness area from the 07-05-21 to the 21-10-21. Ocean plastic is categorized by type (hard plastic (blue), foam (orange), ropes and nets (green), and MOD (Ministry of defence webbing, red) and size (meso (0.5 – 5 cm), macro (5 – 50 cm) and mega (over 50 cm)) (source Plastic@Bay).

3.1.3 Products

Plastic@Bay produces ocean plastic granulate, and manufacture a number of recycled ocean plastic products, including clocks, coasters, and beams. Plastic@Bay is currently working on a system to manufacture plastic lumber, using an extrusion machine designed and built in-house (Awarded at the Women in Innovation 2020). Each extruder line would be capable of recycling between 8 and 262 tonnes of plastic a year depending on the usage made of it as it can be fully automated. Granulate is sold to small-scale manufacturers using low-tech machines. The crafts are marketed to environmentally conscious customers who want to support beach cleaning activities, and are available on their website. Labs looking for “true” ocean plastic that has been at sea and then washed up will also occasionally buy granulate.

Fibres accounted for 54% of the total plastic retrieved, mostly ropes and nets used in the marine sector, mainly fishing, shipping and aquaculture. Macroplastic fibres account for 30%, the majority of macroplastic can be traced directly to offcuts generated from net and creel mending. The remaining volume is

megaplastics, typically made up of a few large ghost nets, and marine ropes. The source of hard plastic on the macroplastic scale is more difficult to identify. Megaplastics items made of hard plastics usually consist of fish boxes, oil drums, and fish farm feeding pipes, with the occasional large floats from abandoned fish farms.



Photo 10. Julien Moreau cutting a trawl net at the net cleaning facility at Durness (Photo by Plastic@Bay®)



Photo 11.a. (l) Shredded trawl net material. **Photo 11.b** (r) The extruder at Durness (Photos by Plastic@Bay®)



Photo 12. Plant pot by Ecotribe (Photo by Plastic@Bay®)

3.1.4 Support from ports/harbours

In 2021, Plastic@Bay did a feasibility study on placing low-tech facilities in harbours to recycle ropes and nets directly, to help prevent them entering the ocean. This research was carried out in harbours located in the NW Highlands, and funded through Innovate UK's Woman in Innovation Award awarded to Dr Joan D'Arcy co-founder and director. Harbourmasters and fishers based in Kinlochbervie, Lochinver and Ullapool completed surveys to help Plastic@Bay get a clearer picture of the types of end-of-life gear being generated, and the state of end-of-life fishing gear waste management in harbours of the Highlands. The result showed the amount of end-of-life gear disposed of by each harbour annually. All harbours send their end-of-life gear to landfill, simply because there is no other option. Everyone surveyed supported localised recycling as the preferred option. In July 2022, Plastic@Bay relocated to Isle of Lewis. Plastic@Bay has been working with harbours and fishers on solutions to prevent waste generated from fishing entering the ocean.

In February 2023, 'Cutting Down' was launched. An initiative to reduce small pieces of ropes and nets generated from mending, entering the sea. The project is based on KIMO's Best Practices to Reduce Marine Litter from Net Cutting Waste. Special collection points have been placed in Stornoway Port Authority Harbours and at three Comhairle nan Eilean Siar (Western Isles Council) Harbours on Lewis and Harris, to encourage clean up and disposal of cuttings. Since many council harbours are unmanned, Plastic@Bay have had to meet directly with fishers working from these harbours. This has proved very positive and many fishers fully support the project. Fishers with smaller trawl boats and creel fishers are more interested in getting involved in the project as they are a part of the communities, they fish and see first-hand the issues. Plastic@Bay recycles the cuttings into plaques for participating harbours and fishing vessels. 'Cutting Down' is funded by the Highland and Island Environmental Foundation and KIMO International. In general, harbour managers and participating fishers are supportive of the work of Plastic@Bay. Being an island community, the problem of waste is more acute, and costly. Together, they are exploring ways to reuse and recycle old fishing gear and reduce waste from entering the ocean.

3.1.5 Main challenges and limiting factors

Finances and industrial space availability are a limiting factor in the rural environment Plastic@Bay has been working in. The geographic and demographic constraints make the usual strategy of focusing all the ocean pollution and end of life fishing gear in a single place not sustainable or advantageous for the communities affected. When considering recycling ocean plastic, the largest cost is manpower. Beach cleaning, sorting and processing is very labour intensive. In the past, Plastic@Bay have employed Coastal Rangers with funding from SSE Community Fund and Highland and Islands Environmental Foundation. Rangers have been instrumental in removing and processing large quantities of plastic pollution. They also rely on a network of local volunteers to help out. Another major limiting factor is the lack of government support, both for community recycling, and impactful/sustained remediation of plastic pollution on the coastline and at sea. The volumes regularly washing up in the NW of Scotland and the islands is very large. The financial and environmental impact of not favouring local and scalable solutions to pollution makes the current strategy not sustainable in such coastal rural environments. Similarly, to many researchers in the domain of circular economy, Plastic@Bay defends a decentralised and community-led circular economy as a solution to local plastic pollution. Plastic@Bay has been defending this strategy at local, national and international levels, in the hope that central governments will reconsider their linear economy strategy to help communities affected by pollution. Local authorities and communities are generally more receptive as they can witness first-hand the impact in the quality of their environment but also the creation of jobs and community events.

3.1.6 Future expansion

In the short-term, Plastic@Bay would like to secure a workshop premises on Lewis, so they can launch their extrusion lines. This workshop would have 3 main activities: (i) the recycling of ocean plastic and end-of-life fishing gear, (ii) the fabrication and the development of leading-edge low-tech machinery and (iii) the training of individuals and communities that want to be involved in our project or develop their own. The long-term aim of the project is not to build a large commercial recycling facility, but to support community-scale recycling centres that empower local people to fight pollution. Plastic@Bay have trained and advised two successful community recycling projects, Transition North, Ronaldsay, on Orkney, and Green Hive, Nairn, in Moray (interview with Julien Moreau & Joan d'Arcy, 23/01/23).

3.2 Yorkshire Wildlife Trust

3.2.1 Types of waste and its processing

This project is both a best practice and a pilot. It was active in the past, but had to stop due to a lack of funding. Through our partnership in the CleanAtlantic project, KIMO International was able to facilitate an updated a new pilot in April 2023. The project provides commercial bins on the quayside for fishers to dispose

of passively fished waste – waste that is fished out of the sea as a part of the fishing process. End of life fishing gear and net cuttings are also disposed of in some of the bins. The bins cover the East Riding of Yorkshire Council harbours (Withernsea commercial, Withernsea recreational, Hornsea, Bridlington and Flamborough) and Scarborough Borough Council harbours (Scarborough, Whitby and Straithes). Unfortunately, the bins have been removed from the Scarborough Borough Council harbours due to inappropriate use. However, there is currently work ongoing to get the bins reinstated. The bins are emptied regularly e.g. Bridlington's 1100L bin is emptied weekly and when checked it is usually full. Therefore, approximately 57,20L is collected from this harbour each year. These are collected by the council's waste disposal processes. In 2022, the total costs for the East Riding of Yorkshire Council harbours came to £1826.24, and these costs usually increase each year. The project was initially funded by the European Maritime Fisheries Fund (EMFF) until Brexit, after which the project has been funded by the Yorkshire Wildlife Trust and the local councils.



Photo 13. Fishing for Litter bin in Bridlington harbour (photo M. Mannaart).

3.2.2 Support from ports/harbours

The Harbourmasters have been very supportive of the project, and have advocated on its behalf. The fishers also appreciate the project, though are slightly less forthcoming in communication and the project did not find it useful to register vessels therefore stopped doing so (though most of the bins can only be accessed by the fishers).

3.2.3 Main challenges and limiting factors

There are a number of waste streams from the harbours that are very difficult to process, including lobster pots and flares. The decline of the fishing industry in England has resulted in a large increase in fishing boats moving from pelagic fishing/trawling to deploying lobster pots. This means that the number of old/worn out lobster pots has substantially increased. The lack of disposal options for the fishers makes it likely that the lobster pots are discarded in the ocean. One company in Hull has offered to take the pots, however transport costs cannot currently be covered.

3.2.4 Future Expansion

The Yorkshire Wildlife Trust Fishing For Litter Project would like to see the bins reinstated in the Scarborough Borough Council harbours, and have also been reconnecting with the wider Fishing for Litter FfL Project. Some of the other FfL harbours in the area are funded by Ørsted, and funding options for the Yorkshire Wildlife Trust FfL Project are currently being explored. If the issues in overcoming lobster pot processing could be overcome, the project would like to come up with a system to deal with this waste stream (interview with Ana Cowie and Lawrence Porter, 01/03/23).



Photo 14. Scarborough's harbour with docked ships and fishing gear on the quayside (photo M. Mannaart).



Photo 15. Bridlington harbour with its central pier with crab pots stored on top (photo M. Mannaart).

Key findings

1. Key findings of waste management practices in ports

Key findings of the waste management of the harbours assessed by means of a survey (with a response of 23 out of 138 harbours) are:

- 30% of the harbours participate in a FfL Scheme.
- 31% of harbours collect passively fished waste in some capacity.
- 100% of harbours that collected FfL waste/PFW had skips or a large bin on the quayside that fishers could land the passively fished waste into.
- 22% of the ports participate in an end-of-life net and net cuttings collection & recycling scheme and/or other recycling schemes.
- 52% of the ports and harbours had a system for disposing of end-of-life nets and net cuttings.
- 75% of the ports that have a system for disposing nets and net cuttings, these could be added to PFW skips, general waste skips or FfL skips.
- 44% of the harbours use a local or national waste management company which will dispose of the net cuttings/end-of-life nets along with the harbour waste or PFW.
- The fate of most of the collected passively fished waste/FfL waste and of end-of-life fishing gear and net cuttings is unclear but there are strong indications that these go into landfill together with other waste streams that were collected in port.
- The visits to ports showed that crab pots and lobster pots pose a special challenge. Those are present in huge numbers and collection and recycling is difficult, due principally to the pots' size, variety of components and the way these, in particular plastics and metal, are linked which makes taking apart difficult. There is no good solution for that yet.

2. Key findings of best practices and pilots on improved sustainable waste pathways for marine litter and/or potential marine litter

Key findings of best practices and pilots on improved sustainable waste pathways for marine litter or potential marine litter are:

- There are numerous initiatives in the United Kingdom that work on the collection and sustainable processing or repurposing of plastic marine litter, for example Journey Blue Net Collect, Ocean Plastic Pots, Odyssey Innovation, Ørsted's collection of ropes, nets and buoys, Plastic@Bay, Refactory and Yorkshire Wildlife Trust's marine litter initiative.
- All initiatives assessed were founded and maintained because of enthusiastic and very dedicated individuals.
- Of the initiatives that shared information, all at least target plastic parts of nets, whether it is EOLFG, or ALDFG, including net cuttings.
- The useable plastic parts of nets are, where possible, being converted into new products (Journey Blue and Plastic@Bay).
- One initiative also targets ropes and buoys (Ørsted's collection of ropes, nets and buoys)
- One initiative targets marine litter in a broad sense, including plastic nets and passively fished waste (Yorkshire Wildlife Trust's marine litter initiative).
- Acquiring funding for processing the plastic waste is the main challenge, in particular funding for the transport from port to processing plant (Journey Blue, Plastic@Bay, Yorkshire Wildlife Trust).
- The number of volunteers is limited (Journey Blue).

- There is limited interest in participation in certain harbours (Yorkshire Wildlife Trust).
- More ships participating could lead to more waste collected at sea (Ørsted).
- Remoteness of coastal areas and low populations density, lead to a lack of volunteers (Plastic@Bay).
- There is a lack of governmental support for community recycling and remediation of plastic pollution (Plastic@Bay).
- Some waste streams are difficult to process (especially lobster pots and flares) (Yorkshire Wildlife Trust).

Conclusions and Recommendations

1 Introduction

1.1 Survey

Of the 138 ports that received the survey only 23 (16.7%) responded, despite several attempts at contact. In terms of statistical significance, this is a low percentage and the outcomes can therefore only be considered as indicative.

1.2 Best practices and pilots

Although a number of suitable ports and initiatives were identified, getting them engaged was challenging, with some stakeholders being initially reluctant to share data or to cooperate. However, stakeholders from Plastic@Bay were keen to participate in a pilot that would address net cuttings and end-of-life creels (chapter 4 of this report). A decision was taken to visit a region with a number of identified initiatives on the collection and processing of marine litter with a focus on fishing gear that had been or were currently running, to assess and discuss opportunities with stakeholders in the field. The selected geographical scope was the area around the Humber Estuary in England. The visit was conducted from 26 February until 4 March 2023 and its input was fruitful and produced a number of cases and two pilots. Although the pilots were of a small scale, they provided invaluable insight in how waste was managed. Those two examples, combined with the information acquired by the study of the best practices and the knowledge of the implementation of Fishing for Litter in the UK, greatly helped to inform an overview of requirements for starting up pilot projects to process marine litter.

2 Conclusions

2.1 Answers to the research questions

The research questions that apply specifically to identify harbours that could serve as a best practice or could be useful for starting a pilot have been removed. Since answers to questions regarding the collection and processing of passively fished waste, Fishing for Litter waste or EOLFG and ALDFG and net cuttings were provided in a generic way, those answers were aggregated.

1. Which ports and harbours participate in UK's FfL-scheme?

A total of 57 harbours participate in the UK's Fishing for Litter scheme of which 31 are in England and 26 in Scotland. Around 30% of the harbours surveyed participate in a Fishing for Litter project – this compares with the 38% of total UK harbours that participate in the scheme. Of those that were not involved in Fishing for Litter, a further 31% of harbours collect passively fished waste in some capacity.

2. Which ports and harbours address net cuttings and end-of life nets?

Ports that responded to the survey and indicated that they participate in an end-of-life net and net cuttings collection & recycling scheme and/or other recycling schemes are 5 which is 22% of the responding ports. Of those, 3 deal with end-of-life nets, 3 with net cuttings (those are the same as end-of-life nets) and 2 apply other recycling schemes.

3. Who are the contacts with the port authorities?

Of the 138 harbours contacted, in 61% of the cases the Harbourmaster or deputy were the key contact points. Others included HSEQ Manager, Environment Officer, Receptionist, Harbour Administrator, Accounts & Admin, Engineering Technician, Finance (Customer Queries) & Admin, or the Sustainability Manager.

4. How many and what type of vessels participate in UK's FfL scheme?

The average number of fishing vessels at each harbour was 14, ranging from 3-56. The composition of the participating fleet are: Creelers/Potters: 32.6%, Trawlers 21.4%, other 20.3%, Gill Netters 11.6%, Liners 7.9%, Trap Setters 4.4% and Dredgers 1.8%. Trawlers and Gill Netters are larger vessels that generally go further offshore. There is little opportunity for the potters/creel boats to collect passively fished waste. Some harbours did not specify how many vessels participate in the FfL scheme.

5. What types and amounts of passively fished waste are landed at each of the participating ports?

The types of waste that were mentioned are passively fished waste/Fishing for Litter waste, EOLFG, net cuttings. There was very little data provided on amounts since specific weights are frequently not recorded.

6. Is passively fished waste also landed at ports/harbours that do not participate in the scheme that we know of?

All of the harbours that collected PFW had skips or, in a few instances, a large bin on the quayside into which fishers could land the passively fished waste.

7. Are vessels that are not registered for FfL allowed to deposit passively fished waste in the FfL skips in port?

Vessels that are not registered for FfL catch passively fished waste and some want to deposit that in the FfL skips in port. The survey asked harbours if this was allowed. Of the 9 responses to this question, 7 said that non-registered vessels were permitted to deposit PFW in the FfL skips. Vessels that are not registered for FfL sometimes want to deposit other waste (such as ship generated) in the FfL skips in port. Harbours were asked if this was allowed. Of the 9 responses to this question, 7 said that vessels were not allowed to deposit other waste into the FfL skips at the port.

8. Do harbour staff check to see if a vessel that wants to land PFW is part of the FfL scheme?

Of the 9 responses to this question, 6 said that the vessels are checked as being a part of the FfL scheme before they land the PFW.

9. If collected, how is FfL waste landed, stored, transported and processed or disposed of, at each of the participating ports/harbours? (insight in the waste value chain)?

All of the harbours that collected PFW had skips or, in a few instances, a large bin on the quayside that fishers could land the passively fished waste into. This is then removed and dealt with by a number of different waste management companies, the local council or in one instance Odyssey Innovation who recycle the waste. Once the waste is removed by the waste management company, the harbour staff on the whole are unaware of its final destination, though most assumed it goes to landfill.

10. If FfL waste is landed, how much (what proportion) of the waste is recycled, how much goes to landfill, incineration or other processing options?

In general, once removed from the harbour premises, there was no knowledge of what was done with the waste. The exceptions were projects that target specific types of waste.

11. What are the requirements for ports/harbours to process/repurpose passively fished waste and net cuttings and end-of life gear? (combined question)

The presence of port reception facilities is a prerequisite. Since most waste is collected in general waste skips and processed by waste management companies, it is unlikely that this waste is processed sustainably. A considerable portion will end in landfill or incineration. In order to repurpose the waste, a targeted collection and processing system must be in place. This can be very simple, a dedicated skip could be sufficient for its collection.

The type of processing or repurposing that is applied is the determining factor for the level of sustainability. All environmentally friendlier systems described in this report were applied by specific incentives that are not part of the general port waste management system.

12. What are the limiting factors for the collecting and processing passively fished waste, net cuttings and end-of life gear? (combined question)

The harbours listed the following limiting factors:

- *Lack of recycling facilities.* The lack of these facilities in the UK is perceived as the biggest limiting factor to the ports. There was a general willingness and desire to look at recycling options but a lack of facilities that would take marine waste as it often degraded and difficult to clean and process.
- *Cost of transportation.* Transportation of waste is often financially unviable even where there were recycling facilities locally.
- *Management.* Management was also an issue that was raised.
- *Not following the rules.* The fishers were not abiding by the requests of the recycling organisation in one occasion, to the point that the recycling organisation decided not to continue to remove old nets and net cuttings from this particular harbour.
- *Free riders.* One harbour expressed issues with leisure vessels and potentially even some of the public using PFW skips for general waste.
- *Too many small ships.* If ports and harbours are smaller, they generally have few fishing vessels and the vessels they do have are more likely to be creel/potters. In this case, the harbours believe they do not collect enough PFW, net cuttings or end of life fishing nets to make collection worthwhile.
- *No recycling options.* There is a lack of recycling options for lobster and crab pots.

The best practices and pilots listed somewhat different challenges, including:

- *Funding of transport and processing* of the plastic waste is a major issue (Journey Blue, Plastic@Bay, Yorkshire Wildlife Trust).
- *The number of volunteers is limited* (Journey Blue), in some cases remoteness of coastal areas and low populations density result in a lack of volunteers (Plastic@Bay).
- *Limited interest* in participation in certain harbours (Yorkshire Wildlife Trust).
- *Small number of ships that participate.* More participation by ships could result in more waste collected at sea (Ørsted).
- *Lack of governmental support* for community recycling and remediation of plastic pollution (Plastic@Bay).
- *Difficulty in processing some waste streams* (especially lobster pots and flares) (Yorkshire Wildlife Trust)

13. If collected, how are net cuttings and/or end-of-life nets landed, stored, transported and processed or disposed of, at each of the participating ports/harbours?

Around 52% of the ports and harbours had a system for disposing of end-of-life nets and net cuttings. However, in over 75% of the cases this meant this type of waste would be added to PFW skips or general waste skips. The fate of this waste is not known, but chances are high that this is not sustainably processed, repurposed or recycled and likely to end in landfill or incineration.

14. If collected, what costs are associated with landing, storage, transportation and processing or disposing of net cuttings and/or end-of-life nets at each of the participating ports/harbours?

Many harbours did not have the breakdown of how the waste costs were divided. Those that had an arrangement with an organisation such as Odyssey Innovation did not pay the costs for disposal of net cuttings and/or end-of-life nets. The small number of responding harbours that did list costs indicated that those ranged from £280 per tonne to get rid of old abandoned nets, to £500 per skip uptake, to approximately £2,600 per annum, which included staff time and receptacles. FfL provides skips at no cost to the fishers or harbour, however in several instances the harbour financially contributes.

15 Are net cuttings and end-of life nets being treated as separate waste streams in ports? If collected but not treated separately, what is done with net cuttings and end-of life nets in ports? (combined question).

22% of the ports (5) indicated that they participate in an end-of-life net and net cuttings collection & recycling scheme and/or other recycling schemes. Around 52% of the ports and harbours had a system for disposing of end-of-life nets and net cuttings. However, in more than 75% of the cases this meant they could be added to PFW skips, general waste skips or FfL skips.

16 At the ports/harbours that participate in one or more marine litter schemes (FfL, net cuttings and end-of-life nets), are these types of waste also processed sustainably and/or repurposed?

Apart from the best practices and pilots, in most cases the waste is mixed with the other waste and disposed of, mostly to landfill.

17 In case FfL, net cuttings and end-of-life nets are processed sustainably and/or repurposed, where is that done (e.g. private business, public facility)?

Private initiatives.

18 What are cost implications of each (including transportation costs)?

Not much information acquired on this topic, but it differs very much from project to project. The harbours that did list costs indicated that those ranged from £280 per tonne to get rid of old abandoned nets, to £500 per skip uptake, to approximately £2,600 per annum, which included staff time and receptacles. FfL provides skips at no cost to the fishers or harbour, however in several instances the harbour financially contributes.

19 Which of the three waste streams is/are recycled and/or repurposed?

EOLFG and ALDFG including net cuttings are the streams that are recycled and repurposed. In some cases, this applies to crab pots that are reused as flowerpots.

20 Which part of the particular waste stream(s) is recycled and/or repurposed?

Insufficient information was provided.

21 What products are made out of these waste streams?

Plastic pellets and granulate for producing new products. Some projects produce kayaks, plant pots and others return ropes, nets and buoys to the owners or those interested in these products.

22 At what ports are best practices present of the management of net cuttings, end-of-life nets and Fishing for Litter waste, and for which of the three waste types?

According to the survey: what best practices are present of the management (from collection, storage, transportation and repurposing) of net cuttings, end-of-life nets and passively fished waste? The larger ports have waste management plans, and it was recognised that safe storage and separation of different materials were generally considered best practice. Odyssey Innovation has collection requirements for the ports that participate, however these were not detailed. One port commented on the lack of specific guidelines for the waste management of net cuttings, end-of-life nets and passively fished waste. During interviews it was shared that best practices are present in the Western Isles harbours (Plastic@Bay), and the harbours of Whitby and Scarborough (Journey Blue Net Collect); Grimsby (Ørsted collection of ropes, nets and buoys); Withernsea commercial, Withernsea recreational, Hornsea, Bridlington and Flamborough (Yorkshire Wildlife Trust marine litter collection).

23 Which organisations are involved in the value chain of those best practices?

Best practices and pilots involved Journey Blue Net Collect, Ørsted, Plastic@Bay and Yorkshire Wildlife Trust. Also involved were Ocean Plastic Pots, Odyssey Innovation and Refactory, although no information was received from these enterprises.

24 What are the driving factors of those best practices?

Enthusiastic and very dedicated founders and people that run the projects.

25 What are the main challenges to overcome for those best practices?

- Funding of processing the plastic waste is the main challenge of which funding of the transport from port to processing plant is a major issue (Journey Blue, Plastic@Bay, Yorkshire Wildlife Trust).
- The number of volunteers is limited (Journey Blue).
- There is limited interest in participation in certain harbours (Yorkshire Wildlife Trust).
- More participating ships could lead to more waste collected at sea (Ørsted).
- Remoteness of coastal areas and low populations density, lead to a lack of volunteers (Plastic@Bay).

- There is a lack of governmental support for community recycling and remediation of plastic pollution (Plastic@Bay).
- Some waste streams are difficult to process (especially lobster pots and flares) (Yorkshire Wildlife Trust).

26 What are the driving organisations of those best practices?

The drivers are not-for profit organisations.

3 Recommendations

2.1 General recommendations

1. For addressing passively fished waste (including Fishing for Litter waste), EOLFG, ALDFG and net cuttings effectively at a large scale, these should be included in the waste reception and handling plans and actions of each fishing port/harbour in the UK.
2. Vessels should be allowed to land and deposit passively fished waste at fishing ports regardless of whether or not they are registered for the Fishing for Litter scheme.
3. Reception facilities for each waste type - passively fished waste, end-of-life fishing gear and net cuttings - should be provided in all fishing ports, and it must be ensured that these are available solely for the storage of each type of waste.
4. The establishment of waste recycling facilities at regional (county) level should be encouraged. Linkage to initiatives for community recycling and remediation of plastic pollution could be an option for creating synergies with society.
5. Governmental support for community recycling and remediation of plastic pollution should be provided.
6. It is strongly advised to conduct an assessment of methodologies for environmentally friendly processing of crab and lobster pots, with the ultimate aim to develop a methodology to process these.
7. Developing and organizing awareness raising and/or educational schemes for harbour staff, fishers and crew of guard ships on landing and storage of marine and fisheries-related wastes in ports.

2.2 Recommendations to pilot projects for optimizing waste processing

Approximately one third of the UK ports participate in a passively fished waste collection scheme, and those have at least some kind of storage facilities present. Despite that, most passively fished waste, EOLFG and ALDFG collected ends up in landfill or incineration. Those facts may indicate that there is a considerable amount of marine plastic waste present. Crab pots are present in large numbers for which no proper recycling methodology is present yet. These are all opportunities for developing recycling projects. What was learned from the surveys and the interviews with organisation's representatives that want to recycle marine litter is that for the development of pilot projects on marine litter it is strongly advised that there should be:

1. Sufficient amounts of marine Litter present for longer-term collection and processing, and the creation of a viable business model. "Sufficient" amount is not quantified because this depends on the target of the organisation, the financial needs and the capacity (scale) it can deal with. Economies of scale – bringing waste from several locations to a single point – should be considered. It is likely, that a highly commercial initiative will need more input of better quality than an initiative that is run by the government or mainly run by volunteers.
1. A good understanding and a clear vision of:
 - a. What marine litter is, its specific components (e.g. what type of plastic), its location, the volume of litter to be targeted and for what purpose.
 - b. The availability of financially and technologically viable methodologies and equipment for sustainably processing of that waste.

- c. How to collect, transport, store and process the waste. (Are the facilities aimed at sufficiently equipped, for example in terms of storage capacity, and are people willing to hand in the waste needed in case it is produced by a specific group/sector? Is the processing facility not too far away from the locations where collection takes place?)
 - d. What products are planned to be made from the waste.
 - e. The presence of a sufficiently large market for those products.
 - f. What those products will generate in terms of money.
 - g. What legal requirements apply (for example permits for storage, transport or processing the waste)
 - h. The partner organisations needed to make it all work (in terms of participating ports, governmental organisations, additional cleaning and processing and funders etc).
 - i. The number of staff/volunteers that are needed to start the project (this could be people on land but also crews of ships).
 - j. The initial cost associated with the activities, transport, storage, processing and legal requirements.
 - k. The way the initial stage and the later stages of the project will be funded.
3. The presence of:
- a. Sufficient quantities of useable waste of the right composition and quality for the longer term at locations where those could be easily collected.
 - b. Sufficient funding for start-up and a viable business model for the longer term.
 - c. Adequate technical means for collection, storage and transport.
 - d. An effective processing technique (viable both technically and financially).
 - e. Adequate and informed staffing.
 - f. The availability of technical support options when needed (by partners).
 - g. Legal requirements (including permits).
 - h. A market that is interested in the products and willing to pay to support the project.

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Annexes

1. Annex I.a List of representatives of ports and harbours that were contacted for filling out the survey

Port/Harbour	Harbourmaster Name	Location	Comments
Aberystwyth	Lt. Cdr. Norrington Davies	Wales	
Alnmouth	Karl Brunton	England	
Anstruther	Tom Fyall	Scotland	
Arbroath	Bruce Flemming	Scotland	
Axmouth	Peter Blyth	England	
Barrow in Furness	Carl Bower	England	
Bembridge	Malcolm Thorpe	England	
Berneray	Roddy Jardine	Scotland	
Berwick-Upon-Tweed	Duncan Wood	England	
Bideford	Roger Hoad	England	
Blyth	Martin Lawlor	England	
Boston	Andy Lawrence	England	
Brancaster	Richard Lowe	England	
Bridlington	Lawrence Porter	England	
Bridport	T Preston	England	
Brightlingsea	Robin Cole	England	No fishing vessels, so n/a
Brighton	Mike Hatch	England	
Brixham	Capt. Paul Labistour	England	
Brora	Duncan Sutherland	Scotland	
Buckie and Burghead	Darren Bremner	Scotland	
Burnmouth	John Aitchison	England	
Burryport	Rory Dickinson	England	
Campbeltown	Stephen Scally	Scotland	
Carradale	Stephen Scally	Scotland	
Cemaes Bay	Graham Till	Wales	
Chichester	Richard Craven	England	
Collafirth	Capt Jim Dickson,	Scotland	
Conwy	Dafydd Williams	Wales	
Cromarty	Ronald Young	Scotland	
Dartmouth	David White	England	
Dunbar	Fiona Kibby	Scotland	
Exmouth	Steve Hockings-Thompson	England	
Eyemouth	Brenden Bates	Scotland	
Falmouth	Duncan Paul	England	
Faversham		England	
Fleetwood	Paul Jervis	England	
Folkstone	Glyn Richmond	England	

Port/Harbour	Harbourmaster Name	Location	Comments
Fowey	Capt. Paul Thomas	England	
Fraserburgh	Thomas Boyle	Scotland	
Girvan	Thomas McKee	Scotland	
Golspie		Scotland	
Gourdon	James Brown	Scotland	
Great Yarmouth	Eddie Freeman	England	
Grimsby	Chris Bowlas	England	
Hayle	Peter Haddock	England	
Helmsdale	Donald Sutherland	Scotland	
Hillhead	John Wardale	England	
Holy Island	Paul Douglas	England	
Hull	Douglas Morrison	England	
Ilfracombe	Capt. Georgina Carlo-Paat	England	
Inverness	Sinclair Browne	Scotland	
Isle of Whithorn	Shaun McGuire	Scotland	
John O Groats	Alec Jappy	Scotland	
Johnshaven	James Brown	Scotland	
Kallin	Roddy Jardine	Scotland	
Kinlochbervie	Gary Mitchell	Scotland	
Kirkcudbright	William Jones	Scotland	
Langstone	Capt Nigel Jardine	England	
Leigh on Sea		England	
Lerwick	Stuart Wadley	Scotland	
LittleHampton	Lee Harrison	England	
Lochboisdale	Roddy Jardine	Scotland	
Lochinver	Joseph Mackay	Scotland	
Longhope (Hoy)	Brian Archibald	Scotland	
Looe	Tina Hicks	England	
Lossiemouth	Amanda Chisholm	Scotland	No fishing vessels, so n/a
Lower Fishguard	David Dean	England	
Lowestoft	Alastair MacFarlane	England	
Lyme regis	James Radcliffe	England	
Lymington	Ryan Willegers	England	
Macduff, Banff, Portsoy, Rosehearty	Duncan Mackie	Scotland	
Mallaig	James McLean	Scotland	
Margate	Simon Brown	England	
Maryport	Pauline Gorley	England	
Mevagissey	Andrew Trevarton	England	
Minehead		England	

Port/Harbour	Harbourmaster Name	Location	Comments
Montrose	Ross Marshall	Scotland	
Morston Quay	The National Trust	England	
Nairn	Robbie Barron	Scotland	
Newhaven	Wayne Streeter	England	
Newlyn	Jonathan Poynter	England	
Newport	Wayne Pritchett	England	
Newquay	Kimberley Johnson	England	
North Shields	Capt. Mike Nicholson	England	
Orford	Philip Attwood	England	
Padstow	Bryn Phillips	England	
Paignton	Capt. Kevin Mowat	England	
Pellheli	Barry Davies	Wales	
Penzance	James Broughton	England	
Peterhead	John Forman	Scotland	
Pittenweem	Donald Low	Scotland	
Pol nan Crann	Roddy Jardine	Scotland	
Polperro	Mr Chris Curtis	England	
Poole	Jim Stewar	England	
Port Penrhyn	Ian Williams	Wales	
Portmahomack	Hamish Mackay	Scotland	
Portreath	J Veasey	England	
Portscatho	Simon Taffinder	England	
Portsmouth	Martin Putman	England	
Rothsay	Steven Neilson	Scotland	
Ryde	Dave Brown	England	No fishing vessels, so n/a
Rye	James Bateman	England	
Salcombe	Capt. Ian Gibson	England	
Saundersfoot	Dave Richards	England	
Scalpay	Roddy Jardine	Scotland	
Scarborough	Martin Willis	England	
Scrabster	Jason Hamilton	Scotland	
Scrabster	Ross Farquhar	Scotland	
Seahouses	R H Reay	England	
Shoreham	Rodney Lunn	England	
Silloth	Paul Litten	England	
Southwold	Colin Carr	England	
St Andrews	Neil Cunningham Dobson	Scotland	
Stockinish	Roddy Jardine	Scotland	
Stonehaven	James Brown	Scotland	
Stornoway	Capt. Torquil Macleod	Scotland	

Port/Harbour	Harbourmaster Name	Location	Comments
Stranraer	Gail Pickett	Scotland	
Sutton- Plymouth	Sue Tansey	England	
Symbister	Capt. Jim Dickson,	Scotland	
Tarbert	Donald MacAlister	Scotland	
Tenby	Matt Broadhurst	England	
Tingwall	Brian Archibald	Scotland	
Torquay	Capt. Kevin Mowat	England	
Troon	John Munro	Scotland	
Ullapool	Kevin Peach	Scotland	
Ventnor	Sean Strevens	England	
Walberswick	Colin Carr	England	
Warkworth Harbour	Simon Baxter	England	
Watchet		England	
Wells next to the Sea	Robert Smith	England	
Weymouth	Peter Mole	England	
Whitby	Capt. Bill Estil	England	
Whitehaven	Celia MacKenzie	England	
Whitstable	Mike Wier	England	
Wisbech	Peter Allen	England	No fishing vessels, so n/a
Workington	Sven Richards	England	
Yarmouth	Bryn Bird	England	

2. Annex I.b Overview of survey questions

General Information

Date :

Your name :

Your position :

Your email address :

Name of port/harbour :

Organisation/company :

1. Does your harbour participate in a Fishing for Litter (FfL) Scheme?
2. If not, do you collect passively fished waste (PFW) in any capacity?
3. What type of vessels and how many participate in the FfL scheme at your port?

Type	Number
Trawlers	
Seiners	
Dredgers	
Lift Netters	
Gill netters	
Trap setters	
Liners	
Vessels using pumps for fishing	
Other	
Other	
Other	

4. Are vessels that are not registered for FfL allowed to deposit passively fished waste in the FfL skips in port?
5. Are vessels that are not registered for FfL allowed to deposit other waste (such as ship generated) in the FfL skips in your port?
6. Do harbour staff check to see if a vessel which wants to land passively fished waste is part of the FfL scheme?
7. If collected, how FfL or PFW waste landed, stored, transported and processed or disposed-of, at your port? Please include

Part of the process	Way of dealing with FfL waste during part of the management process
Waste landing	
Waste storage	
Waste transportation	
Waste processing	
Waste disposal	
Other	

8. If FfL or PFW waste is landed, how much (what proportion) of the waste is recycled, how much goes to landfill, incineration or other processing options?

Type of waste disposal/processing of FfL-waste that is landed at your port	How much of the FfL-waste is dealt with this way? (tonnes or %)
Reuse	
Recycling	
Landfill	
Incineration	
Other	

9. Are net cuttings and end-of life nets being treated as separate waste streams in your port?
10. If collected and landed, how are net cuttings and/or end-of-life nets landed, stored, transported and processed or disposed-off, at your port? Please indicate whether it is recycled, and if so how it is repurposed.

Type of waste	Amount (tonnes)	How handled
Net cuttings		
End-of-life nets		
Other		

11. If net cuttings and end-of-life nets are processed sustainably and/or repurposed, where is that done (e.g. private business, public facility)?

Type of waste	At what facility/company sustainable processed or repurposed
Fishing for Litter Waste	
Net cuttings	
End-of-life nets	
Other	

12. If collected, what cost are associated with landing, storage, transportation and processing or disposing-off of net cuttings and/or end-of-life nets and FfL-waste at your port?

Type of waste	Associated cost of handling
Fishing for Litter	
Net cuttings	
End-of-life nets	
Other	

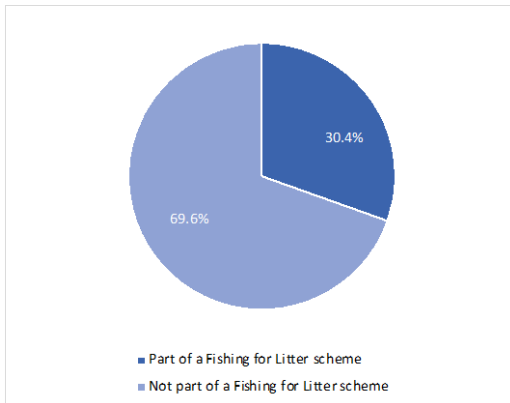
13. What are the requirements (practically, technically, legally or otherwise) for your port to process/repurpose passively fished waste, net cuttings and end-of life gear?
14. What are the limiting factors in collecting and processing passively fished waste, net cuttings and end-of life gear?
15. Do you know at what best practices are present of the management (from collection, storage, transportation and repurposing) of net cuttings, end-of-life nets and passively fished waste?
16. What are the main challenges to overcome for those best practices?

3. Annex I.c Outcomes of the survey

Of the 138 ports and harbours contacted for the survey, 16.67% (23) replied either by email or over the phone. The proportion of questions answered greatly varied, due to the large variation in port/harbour size and/or relevancy being dependent on whether ports/harbours had a large or small number of fishing boats.

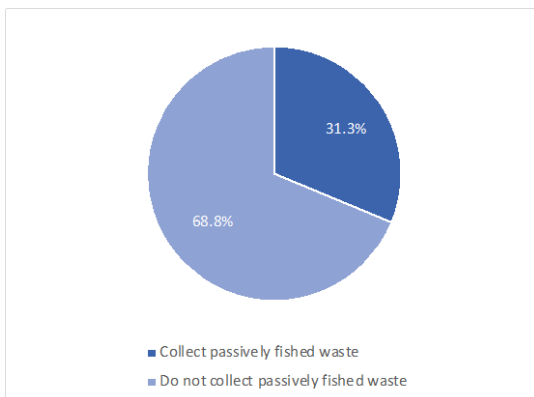
4 Does your harbour participate in a Fishing for Litter Scheme?

Around 30% of the harbours surveyed participate in a FfL Scheme - Around 30% of the harbours surveyed participate in a Fishing for Litter project – this compares with the 38% of total UK harbours that participate in the scheme.



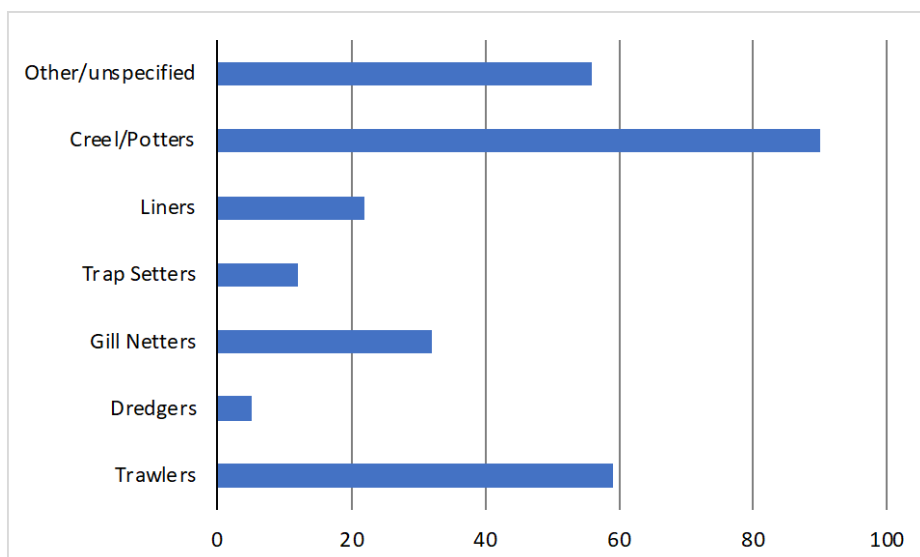
5 If not, do you collect passively fished waste (PFW) in any capacity?

Of those that were not involved in fishing for litter, a further ~30% of harbours collect passively fished waste at some capacity.



6 What type of vessels and how many participate in the FfL scheme at your port?

The average number of fishing vessels at each harbour was 14, ranging from 3-56. The majority were potters/creel boats, which utilise crab and lobster pots in inshore fishing areas. This was followed by trawlers and then gill-netters. These are larger vessels that generally go further offshore. There is little opportunity for the potters/creel boats to collect passively fished waste. Harbours did not specify how many vessels participate in the FfL scheme.



7 Are vessels that are not registered for FfL allowed to deposit passively fished waste in the FfL skips in port?

Of the 9 responses to this question, 7 said that non-registered vessels were allowed to deposit PFW in the FfL skips.

8 Are vessels that are not registered for FfL allowed to deposit other waste (such as ship generated) in the FfL skips in your port?

Of the 9 responses to this question, 7 said that vessels were not allowed to deposit other waste into the FfL skips at the port.

9 Do harbour staff check to see if a vessel which wants to land passively fished waste is part of the FfL scheme?

Of the 9 responses to this question, 6 said that the vessels are checked as being a part of the FfL scheme before they land the PFW.

10 If collected, how is FfL or PFW waste landed, stored, transported and processed or disposed-of, at your port?

All of the harbours that collected PFW had skips or, in a few occasions, a large bin on the quayside that fishers could land the passively fished waste into. This is then removed and dealt with by a number of different waste management companies, the local council or in one instance Odyssey Innovation who recycle the waste. Once the waste is removed by the waste management company, the harbours are on the whole are unaware of its final destination, though most assumed it goes to landfill.

11 If FfL or PFW waste is landed, how much (what proportion) of the waste is recycled, how much goes to landfill, incineration or other processing options?

As stated above, once removed from the harbour premises, there was no knowledge of what was done with the waste.

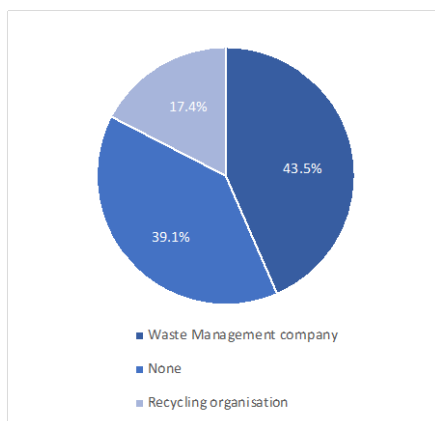
12 Are net cuttings and end-of-life nets being treated as separate waste streams in your port?

There was a large variety of management processes used to deal with net cuttings and end-of-life nets, but if net cuttings and end-of-life nets were collected, they were generally treated as one waste stream.

13 If collected and landed, how are net cuttings and/or end-of-life nets landed, stored, transported and processed or disposed-of, at your port? Please indicate whether it is recycled, and if so how it is repurposed.

Around 52% of the ports and harbours had a system for disposing of end-of-life nets and net cuttings. However, in 3/4 instances, this meant they could be added to PFW skips or general waste skips.

Out of the 23 ports/harbours, two have the net cuttings and end-of-life processed by Odyssey Innovation and one by ocean plastic pots. These are organisations known to recycle the end-of-life nets and net cuttings. Odyssey Innovation to make kayaks, and Oceans Plastic Pots to make plant pots. One of the ports used an undisclosed marine waste recycling facility. Around 40% of the harbours do not provide any facilities for net cuttings and/or end of life nets, often when there are only a smaller number of fishing vessels in the harbour or the fishing fleet is majority potters/creel fishers. 43.5% of the harbours use a local or national waste management company which will dispose of the net cuttings/end-of-life nets along with the harbour waste or PFW. This includes one harbour that collect end-of-life nets individually and drops them off at a council skip at one of the larger harbours. It was assumed by the majority of harbours that the net cuttings and end of life nets collected by the waste management companies would be disposed of in landfill, although not known for certain.



14 If net cuttings and end-of-life nets are processed sustainably and/or repurposed, where is that done (e.g. private business, public facility)?

- Odyssey Innovation
- Ocean Plastic Pots

15 If collected, what cost are associated with landing, storage, transportation and processing or disposing of net cuttings and/or end-of-life nets and FfL-waste at your port?

Many harbours did not have the breakdown of how the waste costs were divided. Those that had an arrangement with an organisation such as Odyssey Innovation did not pay for the costs of disposing net cuttings and/or end-of-life nets. The harbours that did list costs ranged from £280 per tonne to get rid of old abandoned nets to £500 per skip uptake to approximately £2,600 per annum, which included staff time and receptacles. FfL provide skips at no cost to the fishers or harbour, however in several instances the harbour financially contributes.

16 What are the requirements (practically, technically, legally or otherwise) for your port to process/repurpose passively fished waste, net cuttings and end-of life gear?

Legally, it seems there is no need for harbours to process/repurpose passively fished waste, net cuttings and end-of life gear. Practically, do so requires waste receptacles such as skips, bins and in the case of PFW, bags to go into the ships.

17 What are the limiting factors in collecting and processing passively fished waste, net cuttings and end-of life gear?

There were a few themes in limiting factors. The biggest limiting factor is the lack of recycling facilities in the UK. There was a general willingness and desire to look at recycling options but a lack of facilities that would take marine waste as it often degraded, difficult to clean and the processing of it is difficult. Even in the case that there were recycling facilities somewhat locally, the logistics of transportation meant that it was financially unviable.

In the harbours, several commented on a lack of space for the bins and skips, alongside the associated costs with dealing with the waste. Some historical harbours have limited commercial incomings, with one port saying that they are a Grade A listed structure and any money made from berthing is spent on maintaining the harbour and its fittings, and pontoons a sluice/lock gate and bridge.

Management was also an issue that was raised. On one occasion, the fishers were not abiding by the requests of the recycling organisation, to the point that the recycling organisation decided to no longer remove old nets and net cuttings from this particular harbour. Another harbour expressed issues with leisure vessels and potentially even some of the public using PFW skips for general waste.

If ports and harbours are smaller, they generally have few fishing vessels and the vessels they do have are more likely to be creel/potters. In this case, the harbours believe they do not collect enough PFW, net cuttings or end of life fishing nets to make collection worth it. There is a lack of recycling options for lobster and crab pots.

18 Do you know at what best practices are present of the management (from collection, storage, transportation and repurposing) of net cuttings, end-of-life nets and passively fished waste?

The larger ports have waste management plans, and it was recognised that safe storage a separation of different materials were generally considered best practice. Odyssey innovation have collection requirements for the ports that participate, however these were not detailed.

One port commented on the lack of specific guidelines for the waste management of net cuttings, end-of-life nets and passively fished waste.

19 What are the main challenges to overcome for those best practices?

Many harbours say that the fishers have expressed a big interest in removing waste from the sea, but that funding and resources are lacking in this area. However, a couple of the harbours say that there are sometimes issues with fishers abiding by the guidelines in place such as using the correct bins.

4. Annex II.a Overview of Ports and Harbours participating in the Fishing for Litter Programme

Port/Harbour	Location	Fishing for Litter
Boston	England	✓
Bridlington	England	✓
Brixham	England	✓
Buckie	Scotland	✓
Campbeltown	Scotland	✓
Clovelly	England	✓
Cromer	England	✓
Cullivoe	Scotland	✓
Dunbar	Scotland	✓
East Runton	England	✓
Eyemouth	Scotland	✓
Flamborough	England	✓
Fraserburgh	Scotland	✓
Gairloch	Scotland	✓
Girvan	Scotland	✓
Grimsby	England	✓
Hayle	England	✓
Holderness	England	✓
Hornsea	England	✓
Ilfracombe	England	✓
Isle of Whithorn	Scotland	✓
Kings Lynn	England	✓
Kinlochbervie	Scotland	✓
Kirkcudbright	Scotland	✓
Lerwick	Scotland	✓
Lochinver	Scotland	✓
Looe	England	✓
Macduff	Scotland	✓
Mallaig	Scotland	✓
Maryport	England	✓
Mevagissey	England	✓
Mylor	England	✓
Newlyn	England	✓
Newquay	England	✓
North Berwick	Scotland	✓
North Shields	England	✓
Padstow	England	✓
Penzance	England	✓
Peterhead	Scotland	✓
Plymouth	England	✓
Rothsay	Scotland	✓

Port/Harbour	Location	Fishing for Litter
Salcombe	England	✓
Scalloway	Scotland	✓
Scarborough	England	✓
Scrabster	Scotland	✓
Silloth	England	✓
St Ives	England	✓
Staithes	England	✓
Stonehaven	Scotland	✓
Stornoway	Scotland	✓
Stranraer	Scotland	✓
Tarbert	Scotland	✓
Troon	Scotland	✓
Ullapool	Scotland	✓
Whitby	England	✓
Withernsea Commercial	England	✓
Withernsea Recreational	England	✓

5. Annex II.b. Overview of Ports and harbours participating in an end-of-life net and net cuttings collection & recycling scheme and/or other recycling schemes

Port/Harbour	Location	End-of-life nets	Net cuttings	Other recycling scheme
Dunbar	Scotland	✓	✓	
Exmouth	England	✓	✓	
Ilfracombe	England	✓	✓	
Shoreham	England			✓
Ullapool	Scotland			✓

6. Annex III.a List of interviewees of marine litter processing projects

Name	Position	Organisation	Purpose/objective of organisation	Location	Date of interview
Julien Moreau & Joan d'Arcy	Founders	Plastic@Bay	Plastics recycling	Western Isles	23/01/23
Alistair Lawson	Founder	Journey Blue	Net recycling	Yorkshire	02/03/23
Ana Cowie	Marine Pollution Officer	Yorkshire Wild Fishing for Litter	Waste removal from the sea	Yorkshire	02/03/23

7. Annex III.b Outcomes of the assessment of marine litter processing projects

1. Interview with Plastic@Bay

23 January 2023; with co-founders Julien Moreau & Joan d'Arcy

Interviewed by Mike Mannaart and Rebekah Morris

Plastic@Bay is a not-for-profit organisation and operates within a Circular Economy framework, whereby plastic destined to either reside in the ocean is recycled into products for resale, profits directed back into the company to fund beach cleaning activities.

Note: Plastic@Bay have made a recent move from Durness in the north of mainland Scotland, to the Isle of Lewis, part of the Western Isles. The organisation is still in the process of establishing in Lewis.

Types of waste

In Durness, the focus of the project was beach cleans - approx. 30-50 tonnes of litter was collected from beach cleans over six years. To get a clearer picture of sources and quantities of waste washing ashore, Plastic@Bay monitored and surveyed Balnakeil Bay, Durness over a five-year period. On average, one and a half tonnes was removed from this bay annually. One surveying campaign over a six-month period in 2021 (Fig. 1) showed that 70% of the waste washing ashore was plastic and 30% was webbing associated with military manoeuvres by the Ministry of Defence on Cape Wrath, adjacent to Durness.

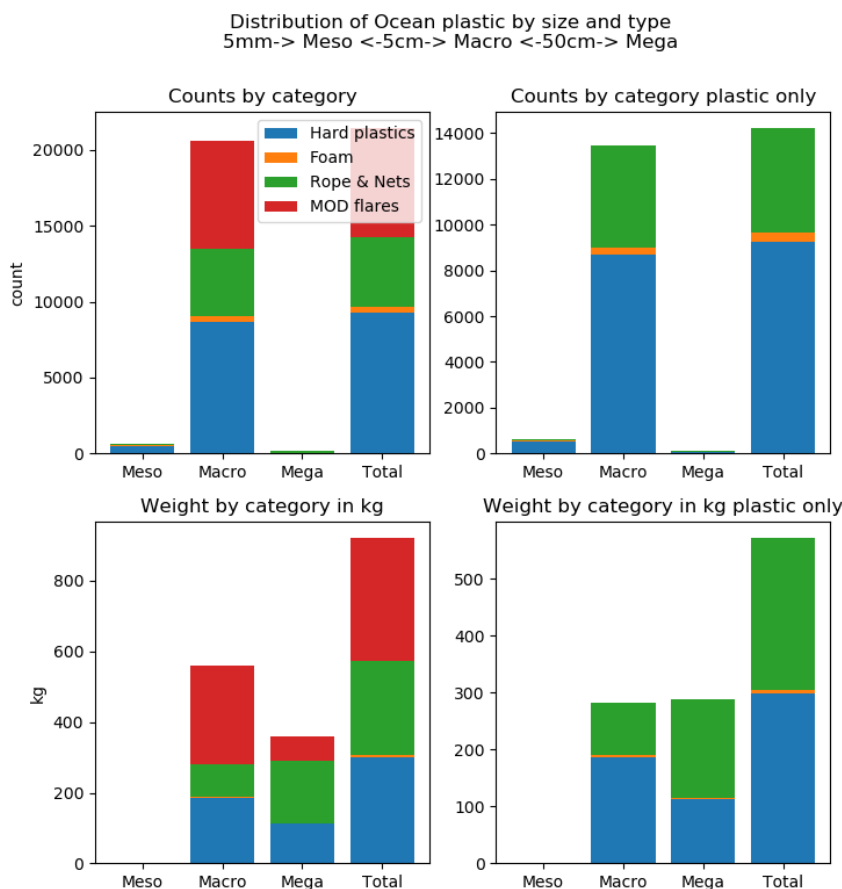


Figure 1. Statistics of monitoring 79 beach cleans made in the Durness area from the 07-05-21 to the 21-10-21. Ocean plastic is categorized by type (hard plastic (blue), foam (orange), ropes and nets (green), and MOD (Ministry of defence webbing, red) and size (meso (0.5 – 5 cm), macro (5 – 50 cm) and mega (over 50 cm)).

Fibres accounted for 54% of the total plastic retrieved, these were mostly ropes and nets used in the marine sector, mainly fishing, shipping and aquaculture. Macroplastic fibres account for 30%, the majority of macroplastic can be traced directly to off cuts generated from net and creel mending. The remaining volume are megaplastics, typically made up of a few large ghost nets, and marine ropes. The source of hard plastic on the macroplastic scale is more difficult to identify. Megaplastics items made of hard plastics usually consist of fish boxes, oil drums, and fish farm feeding pipes, with the occasional large floats from abandoned fish farms.

Processing the waste

The pollution collected from the coast is transported using an off-road vehicle and a van. The waste is sorted and cleaned for processing at Plastic Lab, Durness, Plastic@Bay's recycling workshop. Larger ropes and nets are sorted out in the open at an old military bunker, where they are unravelled and hung on sieving shelves to allow the rain and wind to wash off excess debris such as sand. The sun removes most organic material in the process too. Material of the wrong polymers (foams, thermoset plastics, PVC, rubber) or too contaminated (oil, biofouling) to be recycled is sent to landfill.

At Plastic Lab, Plastic@Bay mechanically recycles polyolefins, polypropylene (PP) and polyethylene (PE). Including marine ropes (PP/PE mix), PE trawl nets, and large hard plastic such as HPDE fish farm feeder pipes, fish boxes and oil drums. The workshop consists of a small industrial shredder, and a variety of low-tech plastic recycling machines, including a compression oven, injection machine and extruder, and specialized tools adapted to processing ocean plastic. The crude cleaning methods can leave some impurities compared to industrial cleaning methods, meaning the granulate may not be suitable for high-speed precision moulding, but it is perfectly adequate for the low-tech machinery developed by Plastic@Bay.

Products

Plastic@Bay produces ocean plastic granulate, and manufacture a number of recycled ocean plastic products, including clocks, coasters, and beams. Plastic@Bay is currently working on a system to manufacture plastic lumber, using an extrusion machine designed and built in-house (Awarded at the Women in Innovation 2020). Each extruder line would be capable of recycling between 8 and 262 tonnes of plastic a year depending on the usage made of it as it can be fully automated. Granulate is sold to small-scale manufacturers using low-tech machines. The crafts are marketed to environmentally conscious customers who want to support beach cleaning activities, and are available on their website. Labs looking for "true" ocean plastic that has been at sea and then washed up also occasionally buy granulate.

Support from ports/harbours

In 2021, Plastic@Bay did a feasibility study on placing low-tech facilities in harbours to recycle ropes and nets directly, to help prevent them entering the ocean. This research was carried out in harbours located in the NW Highlands, and funded through Innovate UK's Woman in Innovation Award awarded to Dr Joan D'Arcy co-founder and director. Harbourmasters and fishers based in Kinlochbervie, Lochinver and Ullapool, filled out surveys to help Plastic@Bay get a clearer picture of the types of end-of-life gear being generated, and the state of end-of-life fishing gear waste management in harbours of the Highlands. The result showed the amount of end-of-life gear disposed of by each harbour annually. All harbours send their end-of-life gear to landfill, simply because there is no other option. Everyone surveyed supported localised recycling as the preferred option.

In July 2022, Plastic@Bay relocated to Isle of Lewis. Plastic@Bay has been working with harbours and fishers on solutions to prevent waste generated from fishing entering the ocean. In February 2023, 'Cutting Down' was launched. An initiative to reduce small pieces of ropes and nets generated from mending, entering the sea. The project is based on KIMO's Best Practices to Reduce Marine Litter from Net Cutting Waste. Special collection points have been placed in Stornoway Port Authority Harbours and at three Comhairle nan Eilean Siar (Western Isles Council) Harbours on Lewis and Harris, to encourage clean up and disposal of cuttings. Since many council harbours are unmanned, Plastic@Bay have had to meet directly with fishers working from these harbours. This has proved very positive and many fishers fully support the project. Fishers with smaller trawl boats and creel fishers are more interested in getting involved in the project, as they are a part of the communities, they fish and see first-hand the issues. Plastic@Bay recycles the cuttings into plaques for participating harbours and fishing vessels. 'Cutting Down' is funded by the Highland and Island Environmental Foundation and KIMO International. In general, harbour managers and participating fishers are supportive of the work of Plastic@Bay. Being an island community, the problem of waste is more acute, and costly. Together, they are exploring ways to reuse and recycle old fishing gear and reduce waste from entering the ocean.

Limiting factors

Finances and industrial space availability are a limiting factor in the rural environment Plastic@Bay has been working in. The geographic and demographic constraints make the usual strategy of focusing all the ocean pollution and end of life fishing gear in a single place not sustainable or advantageous for the communities affected.

When considering recycling ocean plastic, the largest cost is manpower. Beach cleaning, sorting and processing is very labour intensive. In the past, Plastic@Bay have employed Coastal Rangers with funding from SSE Community Fund and Highland and Islands Environmental Foundation. Rangers have been instrumental in removing and processing large quantities of plastic pollution. They also rely on a network of local volunteers to help out.

Another major limiting factor is the lack of government support, both for community recycling, and impactful/sustained remediation of plastic pollution on the coastline and at sea. The volumes regularly washing up in the NW of Scotland and the islands is very large. The financial and environmental impact of not favouring local and scalable solutions to pollution makes the current strategy not sustainable in such coastal rural environments. Similarly, to many researchers in the domain of circular economy, Plastic@Bay defends a decentralised and community-led circular economy as a solution to local plastic pollution. Plastic@Bay has been defending this strategy at local, national and international levels, in the hope that central governments will reconsider their linear economy strategy to help communities affected by pollution. Local authorities and communities are generally more receptive as they can witness first-hand the impact in the quality of their environment but also the creation of jobs and community events.

Future expansion

In the short-term, Plastic@Bay would like to secure a workshop premises on Lewis, so they can launch their extrusion lines. This workshop would have 3 main activities: (i) the recycling of ocean plastic and end-of-life fishing gear, (ii) the fabrication and the development of leading-edge low-tech machinery and (iii) the training of individuals and communities that want to be involved in our project or develop their own. The long-term aim of the project is not to build a large commercial recycling facility, but to support community-scale recycling centres that empower local people to fight pollution. Plastic@Bay have trained and advised two successful community recycling projects, Transition North, Ronaldsay, on Orkney, and Green Hive, Nairn, in Moray.

2. Interview with Journey Blue Net Collect

1 March 2023; with founder Alistair Lawson at Whitby harbour

Interviewed by Mike Mannaart and Rebekah Morris

Types of waste

Journey Blue Net Collect collects old rope, nets and net cuttings from Whitby and Scarborough harbour. The end-of-life gear is dropped off to and stored in locked shipping containers on the quayside – the key can be collected from the Harbourmaster by the fishers to access the container.

Processing the waste

Once the shipping container is close to being full, the waste requires being sorted and picked for transport. This is done approximately once a year, taking a day to take it out the shipping containers and sort it including removing the twine securing sections of the ropes and nets. In the last year and a half that the project has been running, they collected around 6-8 tonnes, of which 4-5 was recycled. Any of the waste that cannot be recycled is disposed of in a council skip. It is then packed into a van and driven to a processing centre in the Bourton-on-the-Water. The waste is then recycled into pellets and fed back into production for example at Milspeed Ltd. This helps create a circular economy.

Journey Blue Net Collect receives help and support from Keep Britain Tidy's Ocean Recovery project, arranging the transportation from the harbours to the processing centre.

Support from ports/harbours

Harbours are generally receptive to the project, with the harbourmaster in Whitby and Scarborough supporting the project. The project deals with a waste stream for the harbours, meaning they do not have to arrange and pay for a waste management company to deal with the nets resulting in it being an appealing project to be a part of.

Limiting factors

Whilst the costs of transporting the waste are supported through Keep Britain Tidy, the initial start-up costs in a port are around £2500 to buy, paint and brand one the shipping containers. Therefore, expansion is limited by this cost.

The processing that needs carried out before transportation takes about a day to do with around 3 volunteers. Again, any scaling up the project would require an increase in volunteers local to the port/harbour.

Future Expansion

There are already ongoing conversations to add a third harbour into the project. There is the possibility of a company in Leeds looking at donating old shipping containers to enable development of the project.

Long term, the project wants to continue expanding into other harbours, with a particular focus on the UK's east coast where the project is currently based. There is a desire to not only look at recycling, but to change behaviour so that there is a reduction in overall waste. This feeds into the other aspect of Journey Blue which is their e-commerce site selling sustainable products.

3. Interview with Yorkshire Wildlife Trust Fishing For Litter Project and Harbour of Bridlington

1 March 2023 with Marine Pollution Officer Ana Cowie at Bridlington Harbour and Lawrence Porter, Harbour Superintendent of Bridlington Harbour.

Interviewed by Mike Mannaart and Rebekah Morris

Types of waste

The project provides commercial bins on the quayside for fishers to dispose of passively fished waste – waste that is fished out of the sea as a part of the fishing process. End of life fishing gear and net cuttings are also disposed of in some of the bins. The bins cover the East Riding of Yorkshire Council harbours (Withernsea commercial, Withernsea recreational, Hornsea, Bridlington and Flamborough) and Scarborough Borough Council harbours (Scarborough, Whitby and Straithes). Unfortunately, the bins have been removed from the Scarborough Borough Council harbours have been removed due to inappropriate use. However, there is currently work ongoing to get the bins reinstated.

Processing the waste

The bins are emptied regularly e.g. Bridlington's 1100L bin is emptied weekly and when checked is usually full. Therefore approximately 57,20L is collected from this harbour a year. These are collected by the councils' waste disposal processes. In 2022, the total costs for the East Riding of Yorkshire Council harbours came to £1826.24, and these costs usually increase each year. The project was initially funded by the European Maritime Fisheries Fund (EMFF) until Brexit, after which the project has been funded by the Yorkshire Wildlife Trust and the local councils.

Support from ports/harbours

The Harbourmasters have been very supportive of the project, and have advocated on its behalf. The fishers also appreciate the project, though are slightly less forthcoming in communication and the project did not find it useful to register vessels therefore stopped doing so (though most of the bins can only be accessed by the fishers).

Limiting factors

There are a number of waste streams from the harbours that are very difficult to process, including lobster pots and flares. The decline of the fishing industry in England has resulted in a large increase in fishing boats moving from pelagic fishing/trawling to deploying lobster pots. This means that the number of old/worn out lobster pots has substantially increased. The lack of disposal options for the fishers makes it likely that the lobster pots are discarded in the ocean. One company in Hull has offered to take the pots, however transport costs cannot currently be covered.

Future Expansion

The Yorkshire Wildlife Trust Fishing For Litter Project would like to see the bins reinstated in the Scarborough Borough Council harbours, and have also been reconnecting with the wider Fishing for Litter (FfL) Project. Some of the other FfL harbours in the area are funded by Ørsted, and funding options for the Yorkshire Wildlife Trust FfL Project are currently being explored.

If the issues in overcoming lobster pot processing could be overcome, the project would like to come up with a system to deal with this waste stream.

Interview 4. Ørsted Fishing for Litter project

27 February 2023; with Nick Garside and Paul Pedersen at the harbour of Grimsby

Marine Litter Officer / skipper of a guard/survey vessel

Organisation/company: Ørsted

Interviewer: Mike Mannaart

Introduction

Mr Garside was formerly a Law Enforcement Fisheries Manager with the Marine Fisheries Agency at Scarborough. He retired in 2010 and is now contracted by Ørsted to coordinate the collection of marine litter at the marine wind farm construction projects including Hornsea I, II and IV. The collection of litter is done by the crew of guard vessels that guard construction sites of windfarms or locations where trenches for cables are dug out at sea. The guard boats have to wait during their duty, and collect floating litter during that time. The litter is stored in a big bag of the type that is also handed out for the UK Fishing for Litter scheme. An estimated half a tonne of litter is collected annually in Scarborough, where it is placed into a skip. The skip is placed behind a fence that is only accessible for Ørsted staff.

Types of waste and its processing

The waste comprises largely of buoys and ropes. Buoys and ropes in good condition and waste with a marker attached are returned to the fishers for reuse. The size of the participating fleet of guard vessels is about 14, which are mostly former fishing boats. Skippers and crew of guard vessels are contacted and leaflets on the project are handed out to acquire more vessels. The waste is paid for by Ørsted and KIMO's Fishing for Litter scheme.

Main challenges

Main challenges perceived include coordination of and communication with the participating vessels and the needed increase of the number of guard vessels. There is however, a large potential of ships (fishing vessels) present that could be utilised.

Background information

"The fishing industry on the Humber (Grimsby and Hull) was probably at its peak in the mid to late 1950's with vessels fishing the grand banks, Greenland, Iceland, North Norway and Svalbard to name some. The Industry had its first setback '59 to early 60's with the Icelandic Cod wars. The fleets were decimated. When I first started working on the Fish Dock in 1990 we were left with about 150 smaller vessels fishing in the North sea, and larger ones venturing into Norwegian waters. We had Trawlers, pair trawlers, anchor seiners and wreck netters fishing mainly for Cod, Plaice, Haddock and Whiting. As EU quota restrictions began to bite the fleet decreased through natural wastage and decommissioning until only a few potters now remain. At its peak the area was like a small town with five bank branches within the Fish Dock site. When I started there were five cafes, all opening at 0530 hours to serve the industry, last month there was only one" (additions shared by Mr. N. Garside by email d.d. 12/04/23).

Information shared during the interview by Mr. Garside and Mr. Pedersen. The fleet declined from 150 fishing vessels to about 20 now in Grimsby only. The past decades wind farms are being constructed which offers other opportunities, since those construction sights need to be guarded. Mr. Pedersen had two trawlers of his own but decided a few years ago to change to guard shipping due to financial reasons caused by the depleted fish stocks. His two fishing vessels were converted into guard vessels. Other fishers changed from white fish to "potting", the collection of crabs and lobsters. Wrecks contain a lot of crabs, which showed to

be sufficiently profitable to aim for this type of fisheries instead of white fish. This change occurred the last 2 decades in Grimsby. Apart from the fish markets there was a large supporting industry in Grimsby present, e.g. fish processing. In other UK ports of which presumably Peterhead and Brixham are the largest remaining ones, apart from fish caught in UK waters is fish from Iceland and Norway processed.

Interview 5. Scarborough Harbour

3 March 2023; with Chris Burrows (Harbourmaster) and James Buck (Deputy Harbourmaster) at the harbour of Scarborough

Interviewer: Mike Mannaart

Introduction

The harbour of Scarborough works jointly with the harbour of Whitby. Fishing in Scarborough harbour changed 10-15 years ago from whitefish to lobsters, crabs and scallops by mostly using pots. In Scarborough, there are approximately 30 vessels smaller than 10m tall that all do potting or fish for scallops. In the port are around 30.000 pots present. A new law will be issued by the North-East Fisheries Authority that will limit the number of pots to 2000 pots per vessel. Handling in waste of fishers is free of charge, this includes all types of waste, for example oil filters, pots et cetera. Fishers are eager to join Journey Blue's project in the harbour where a container is placed. There is not much interest in joining Fishing for Litter; the reason for this is unknown. To cover costs, fishers are charged 4% of their fish landings by the harbour.

Types of waste and its processing

The Scarborough council takes care of the recycling facility and the waste is incinerated. There is also a recycling plant where plastic was sold. The harbour provides 3 large, 1000l bins for derelict pots, but fishers still tend to dump their pots often at sea. Journey Blue has a container in each of the harbours of Scarborough and Whitby. In Scarborough the container is emptied about once a year.

Main challenges

The Fishing for Litter scheme was run in the past but there is not much interest now, pots are presumably often dumped at sea.

