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End-of-Life Fishing Gear Recycling Pilot Study for Wales

Written by Rob Thompson obo
Odyssey Innovation Ltd for
The Welsh Government

ODYSSEY Innovation

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Acronyms & Abbreviations

ALDFG – Abandoned, Lost or Discarded Fishing Gear

OI – Odyssey Innovation

EOL -End-Of-Life Fishing Gear

NRS -Net Regeneration Scheme

MRF -Materials Reclamation Facility

WMFAG- The Wales Marine Fisheries Advisory Group

WCSP- The Wales Clean Seas Partnership

C02- Carbon dioxide

1.0 INTRODUCTION

Marine litter is a global concern affecting all the oceans of the world. Every year, millions of tonnes of litter end up in the ocean worldwide, posing environmental, economic, health and aesthetic problems. Wales is no exception. This poses a risk to the condition of its marine biodiversity and tourism on which the Welsh economy is reliant.

It is broadly assumed that approximately 20% of marine litter (by quantity) consists of fishing gear of varying types and from a variety of sources.

Recently commissioned Welsh Government research sought to identify the types of fishing gear used, their lifespan and options for disposal across selected ports in Wales. The research highlighted a variety of gear types in use by the Welsh fleet, consisting of different materials (some recyclable).

The gear types identified for use by the Welsh fleet are commonly composed of hard plastic (HDPE), rubber, metal and nylon.

Some ports within Wales have the capacity for the disposal of fishing gear, however, opportunities for recycling are largely missed. Some fishing gear is stored because of a lack of disposal facilities whilst some is disposed of at a cost to the fishers.

Welsh Ministers were keen to explore options for collection and recycling opportunities for end-of-life fishing gear in Wales. In 2019 the Minister for Energy, Environment and Rural Affairs agreed to work with UK Administrations to develop solutions for the collection and recycling of end-of-life fishing gear. The Wales Marine Fisheries Advisory Group (WMFAG) a key Welsh Government stakeholder group, took forward the Ministerial commitment and consequently set up a working group which commissioned the research. The pioneering Wellbeing of Future Generations (Wales) Act 2015 set out several key goals for wellbeing for the Welsh Government to consider when implementing policy ensuring responsibility and legacy for future generations.

The UK Marine Strategy requires the UK to take action to achieve and maintain Good Environmental Status (GES) in UK waters. Marine litter is a constituent part of the strategy and includes the need to explore solutions for end-of-life fishing gear to reduce overall levels of marine litter.

The Wales Clean Seas Partnership (WCSP) was formed to tackle the issue of marine litter in Wales. It is responsible for meeting the aims of the UK Marine Strategy and delivering the Welsh Governments vision for clean, safe, productive and biologically diverse seas. The WCSP developed a Marine Litter Action Plan which outlines key objectives to support these aims, which includes end of life fishing gear.

This project takes forward the recommendations of the WMFAG and other previous research as its basis to deliver Welsh Ministers commitments. Similar proposals are being considered across each UK Administration and this pilot scheme will form part of our commitment to develop solutions for the collection and recycling of fishing gear.

1.1 About this Pilot

This pilot project was initiated on behalf of the Welsh Ministers, to establish a baseline for end-of-life fishing gear disposal and recycling solutions in Wales. The brief set out was expected to identify opportunities for recycling different types of fishing gear used by the Welsh fleet and target those ports which would be suitable as part of the pilot scheme.

Funding was provided to cover any capital costs such as waste infrastructure at selected ports and any associated running costs, such as disposal and transportation for the duration of the pilot scheme.

The supplier/contractor was expected to project lead and to liaise with the relevant authorities such as those local authorities and/or port authorities involved in the pilot scheme.

1.2 Project aims and objectives

Following the pilot scheme, this report aims to evaluate and provide data on:

- Number of different fishing gear types recycled
- Quantity (by weight) of fishing gear recycled
- Proportion of expected end of life gear recycled per fishing gear type
- Quantity of fishing gear collected from each port
- Opportunities to recycle within the Welsh waste stream
- Proposed cost to continue the pilot and the potential to upscale to cover further areas in Wales

1.3 Project team

The prime contractor tasked with delivering the Pilot is Odyssey Innovation Ltd (OI) who run a circular economy company focused on providing marine litter solutions to a range of stakeholders within the fishing industry. OI created the Net Regeneration Scheme (NRS), which is a free fully traceable and award-winning fishing gear and plastic waste recycling scheme. It supports the long-term ambitions of 18 harbours and 23beach clean groups, private fisheries and conservation groups to adopt a best practice approach to waste disposal through recycling.

OI began operating in 2014 after Founder/diver/conservationist Rob Thompson embarked on establishing recycling routes for fishing gear and marine plastic route. With the help of Plastix A/S,

Aquafil, Exeter City Council MRF and Seafish this became the UKs first EOL and ALDFG recycling scheme recycling a wide array of fishing gear.

In addition, OI also manufacture products made from end-of-life fishing gear and marine plastic, they are also involved in consultancy work with governments, universities, entrepreneurs and NGOs to help create best practice for fishing gear disposal and prevention of marine plastic. In 2021, OI's Net Regeneration Scheme was officially endorsed by the Global Ghost Gear Initiative as an excellent functioning and experienced initiative dedicated to the cause of reducing marine plastic litter in the ocean[1].

1.4 Using this Pilot as a baseline

The purpose of this pilot is to assist in informing the best practice strategy for disposal of end-of-life fishing gear within Welsh fishing communities. To inform this, it was essential to identify the:

- routes for recycling
- viability of recycling different types of fishing gear
- practicalities of the recycling process
- obstacles to recycling
- economics of creating self-sustaining recycling schemes
- social behavioural and governmental change that's needed to create effective solutions

2.0 METHODOLOGY

The methods adopted were in part informed by the experiences gained through the establishment of the NRS. These needed to be adapted to accommodate the nuanced nature of the Welsh fishing communities.

Creating sustainable fishing gear recycling schemes is complex and there is no one size fits all solution. To understand the appropriateness of the different methods that can be used, it is essential to first have a clear understanding of the challenges involved in running recycling schemes. Based on the prior experiences of the NRS some of these are as follows:

1. It is essential that recycling is free to fishing communities. However, the high logistics and operational costs of creating viable recycling routes, especially from remote locations or

[1] See Annex 1

regions containing low value material usually outweigh any potential profit that can be generated by recycling.

2. Removing cost barriers associated with the disposal of waste also encourages fishermen to bring in ALDGF that they might have encountered along their fishing journeys, sometimes this can difficult to recycle as it is often more contaminated than EOL fishing gear.
3. Recycling schemes should act as a service provider and have the ability to recycle as many different types of fishing gear as possible. (Otherwise, if only the high value materials are recycled though the scheme it would leave behind most of the fishing gear which is recyclable but of low value.)
4. Every harbour has its nuances -some have low volumes of material, some may be short staffed, others might lack space and basic infrastructure ex: no access to forklifts, therefore it is essential to tailor-make solutions.
5. Continuity of supply is essential for running recycling schemes, but material flow assumptions can be inaccurate as these are usually based upon how much fishing gear is being used in a region. However, there are many factors that will hinder this gear entering a recycling scheme.
6. Often harbours with the highest potential volumes of recyclable materials can have the lowest recycling rates. This could be due to the operational structure being larger resulting in less frequent direct communication between the harbour to fishermen. It is therefore essential that information is disseminated in such a way that it goes beyond the harbour team and reaches the individual fishermen.
7. With lack of legalisation making it compulsory to recycle, outreach is especially important as the regional success of a recycling scheme often comes down to the goodwill of its participants.
8. Schemes must be easy to access both in terms of complexity and cost.
9. sometimes fishing gear can be too contaminated to be recycled.
10. Fishing gear often contains many parts that can be time consuming to dismantle for recycling.
11. Training for fishermen to prepare the nets in the correct state for recycling is essential. This can be achieved by providing recycling guidelines, outreach and instructional videos such as the ones created by OI.
12. Making recycling relevant is important for outreach. Fishing gear created from recycled fishing gear is a good way to demonstrate this, examples of this are recycled whelk pots, net bins, recycling/litter bins and recycled ropes.

2.1 Supply chain data for fishing gear used in Wales

To inform the feasibility of running an EOL recycling pilot, it was important to understand the amount of EOL fishing gear that could be made available for recycling, particularly from each harbour with the intention of offering the scheme primarily to those capable of providing the greatest input. This data is often the best starting point, although it is worth bearing in mind that assumptions based on material flow data will likely be inaccurate due to the nature of running voluntary participation recycling schemes. Seafish provided the following information based on the Welsh fleet's annual gear disposal[2]:

2.2 Estimated annual volume of end-of-life fishing gear in Wales

2.2 1 Nylon drift & fixed nets in Wales

- 40 Welsh-registered vessels using drift and fixed nets (Seafish, 2019)
- Each vessel replaces approximately 1,300 m of net per year (APEM, 2020), at 5 kg per 100 m. Please note: weight per 100 m is an estimate and depends on the type of net.
- 65 kg of net per vessel gives a total of 2,600 kg for the Welsh static gear fleet per year.

2.2 2 Estimated annual volume of end-of-life trawl nets in Wales[3]

- 7 Welsh-registered trawlers operating in Wales (Seafish, 2019).
- Average inshore trawl total weight is 600 kg (Seafish inshore fisheries expert opinion).
- Trawls are expected to be replaced every 3 years on average (APEM, 2020).
- Total estimated weight for end-of-life trawls from Welsh trawler fleet is approximately 1,400 kg per year.
- The weight of the netting is about 25% of the weight of the trawl (Seafish inshore fisheries expert opinion), so the approximate weight of netting would be 350 kg per year.

2.2 3 Estimated annual volume of end-of-life whelk pots in Wales[4]

[2] This was taken from Seafish's fleet economic data, dated 2019 and 2020 and reported by APEM 2020

[3] Please note: the below estimates are based on the numbers of Welsh registered vessels using different gear types as defined and indicated by Marine Management Organisation (MMO) data.

[4] Please note: the below estimates are based on the numbers of Welsh registered vessels using different gear types as defined and indicated by Marine Management Organisation (MMO) data.

- 51 Welsh-registered vessels landing whelk (preliminary 2018 landings data, Seafish). working on average 500 whelk pots per vessel (Seafish inshore fisheries expert opinion (300 pots); APEM, 2020 (700 pots)).
- 17.5% pots replaced per year per vessel (Seafish inshore fisheries expert opinion (5%); APEM, 2020 (30%)).
- Estimate total 4,463 whelk pots replaced per year, at 2.5kg high density plastic per pot (Seafish inshore fisheries expert opinion).
- Total estimated weight per year 11,158 kg.

Table 1: Estimated annual volume of end-of-life fishing gear generated by the Welsh fleet -nets, trawls, whelk pots only.

Type of end-of-life fishing gear	**Estimated volume per year (kg)**
Nylon nets	2,600
Trawl nets	350
Whelk pots	11,158
Total estimated volume	**14,108**

(Please note that this doesn't consider end-of-life prawn pots, currently stored end-of-life gear or ALDFG collected during fishing operations.)

2.3 Harbours involved in pilot

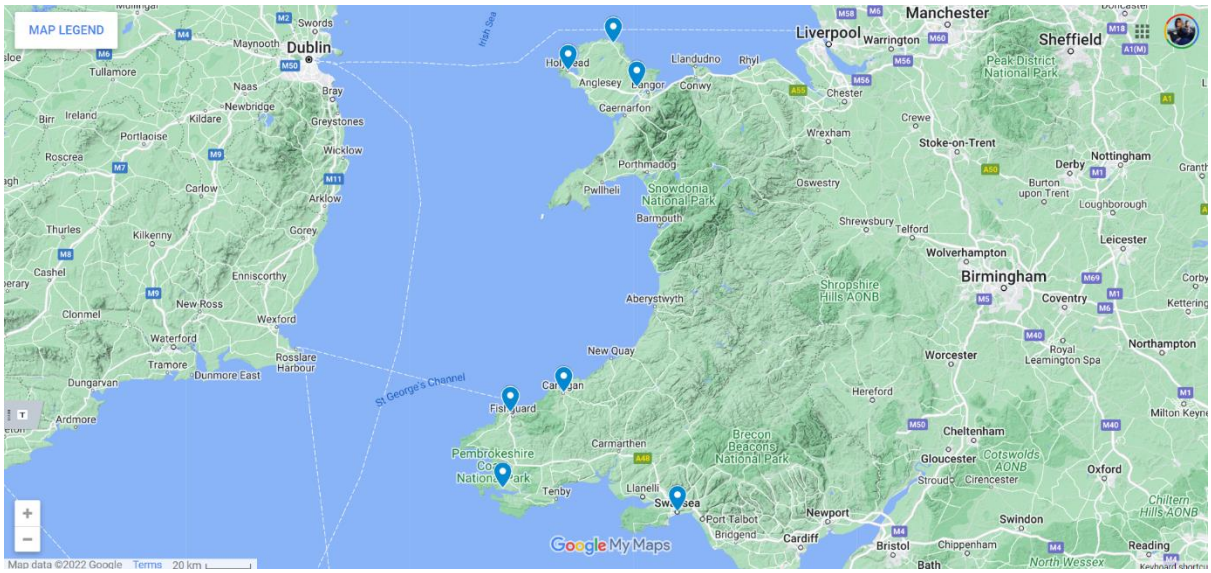
2.3 1 Rational for the choice of pilot harbours

1. The data mentioned above by Seafish helped inform the choice of harbours that were included in the study. A preference was made for focusing on harbours where Whelk fishing was the main fishing activity. This was due to having the greatest potential volumes for recycling.
2. Another consideration for pilot locations was the desire to achieve a good geographical spread along the Welsh coastline to support as much of the Welsh fishing community as possible and to give them representation within this project.
3. Collection logistics were also considered. It would not have been possible to gather enough recyclable material from one harbour so creating a route involving multiple collections to optimise logistics was important.
4. Stakeholder willingness to participate and stakeholder requests.

2.3 2 List of harbours included in the pilot

- Milford Haven
- Fishguard
- Holyhead
- Amlwch
- Cardigan
- Swansea
- Conwy

2.3 3 Map depicting recycling points throughout Wales



2.3 3.1- Map depicting locations of the Pilot's harbour stakeholders

2.3 4 Other Stakeholders involved in/engaged with as part of the pilot

In addition to the above harbours, outreach was conducted with representatives from various entities concerned with waste fishing gear. The purpose was to give all parties the opportunity to be represented in the development of the best practice for the disposal of EOL fishing gear. This cross sectoral working has the potential added benefit of encouraging collaboration between parties that may be approaching the problem from perspectives. The other stakeholders engaged were the:

- Welsh Government

- Welsh Fishermen's Association
- British Ports Authority
- Seafish
- Isle of Anglesey County council
- Pembrokeshire Coastal Forum
- Atlantic Edge Oysters
- Three-Sixty Aquaculture
- Plymouth University (the Indigo Project)
- Looe Marine Conservation Group (crab line recycling scheme)
- Surfers Against sewage
- Marine conservation society
- Keep Wales Tidy
- Neptune Army of Rubbish Cleaners
- Exeter City Council MRF
- Plastix A/S
- Aquafil

3.0 COMMUNICATIONS

3.1 Introduction

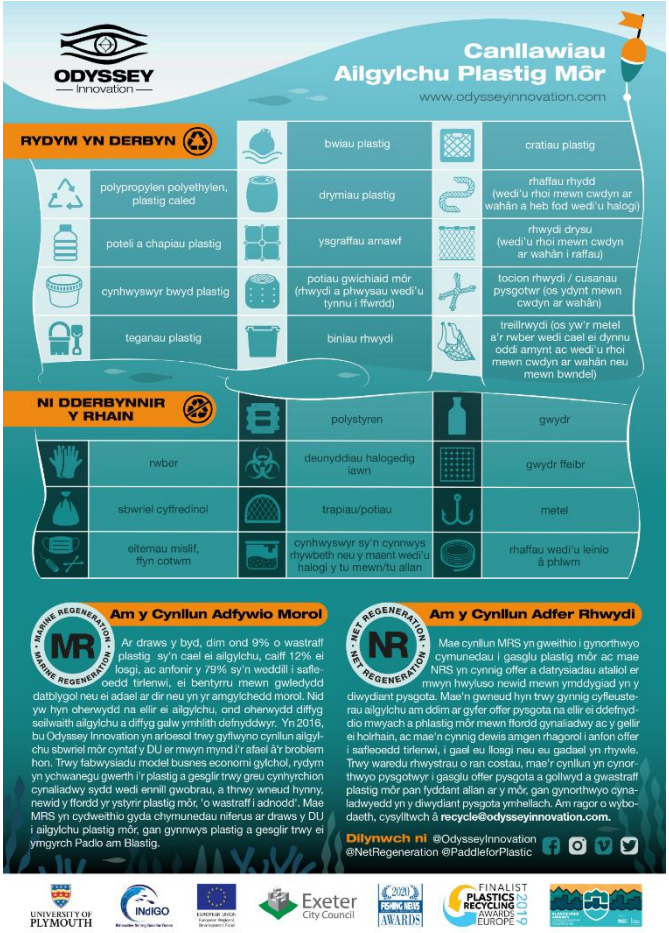
Our initial conversations were with the Welsh Government and Seafish via online meetings, phone calls and emails. Through this we identified and agreed upon the harbours that we would like to engage with.

Due to the lack of legislative support in making recycling compulsory, OI stressed the importance of outreach, (as from experience) the regional success of a recycling scheme often boiled down to the interest and goodwill of its participants. From the outset OI had a clear plan of what to request from the pilot's stakeholders and to ensure maximum uptake it ensured that the Welsh recycling scheme would also be accessible, both in terms of complexity and cost[5].

[5] Although running a recycling scheme for fishing gear can be complex, it is important that the information contained in outreach literature intended to be used by fishermen is user-friendly and streamlined as much as possible.

At the very start of the project it was evident that guidelines needed to be developed to provide clear guidance on what could and couldn't be recycled. Bilingual information boards were created that were attached to skips and used as electronic flyers (distributed via email and social media)[6].

3.2 Initial outreach



3.1.1 The Net Regeneration Recycling Guidelines converted to Welsh for this project

As mentioned previously, each harbour has its own nuances and as a result tailor made solutions are often needed. During the initial outreach with pilot harbours OI tried to capture as much information as possible to assist in developing our collection methodology. This involved individual outreach via email and phone. Through this OI aimed to:

- Establish interest in participation
- Identify fishing gear types most frequently used in the harbour
- Find information relating to material types available for recycling
- Get estimated volumes of recyclable material

[6] See Annex. 3 for English Version

- Gain information on seasonal variations in material flows
- Understand the current infrastructure -if any- of the harbour
- Answer queries and provide information, particularly about the recycling guidelines whilst stressing the importance of ensuring all materials have no bio-fouling on them and nets have had all non-recyclable components removed
- Inform them that if they find items of waste not on the recycling guidelines that can send us a photograph(s) of the waste so that we can advise further
- Emphasise the importance of disseminating information within their fishing community
- Identify the management structure to establish the future point of contact for recycling related correspondence

3.3 Secondary stakeholder outreach

Once the recycling point locations were confirmed the second phase of stakeholder outreach began. This involved engaging with several conservation NGOs that were involved in either beach cleaning activities or the recovery of ALDFG. Some of these groups had partnered with the Net Regeneration Scheme previously in other regions, whilst others were recommended by other stakeholders involved in the pilot. Local introductions were made via email and phone. The key messages/points of discussion were:

- Location of recycling points and contacts
- The importance of cross sector working - by providing EOL fishing gear recycling OI could also offer support to beach clean groups by recycling their plastic waste
- By including ALDFG the scheme can increase volumes and frequency of collection
- The circulation of the same recycling guidelines provided to the fishers
- To inform them that if they find items of waste not on the recycling guidelines that can send OI a photograph(s) of the waste so that we can advise further
- To encourage them to collate as much material as possible beforehand to minimise visits
- The importance of the quality control was emphasised

The scheme works with groups rather than individuals as these assists in quality control through having one person in each group responsible for the waste gathered by multiple individuals. Working with groups as opposed to individuals also has the benefit of minimising visits to the recycling collection points.

3.4 Ongoing Communications

The ongoing communication with the stakeholders varied depending on their individual preference. Some members of the fishing communities displayed a preference for phone calls; this is probably due to the nature of their fishing activities (the irregular hours with poor access to emails). This likely makes it simper for them to make phone calls in between fishing activities. Therefore, going forward having a phone number that fisherman can use for any queries is an essential part of managing a scheme.

The harbour management teams were mostly contacted by email with occasional phone calls. The purpose of this was mostly to encourage dissemination of information to the fishing fleet, updates, problem reporting, estimated collection volumes and collection coordination. Online meetings were often used for other stakeholders, this seemed to be preferential to them especially during the Coronavirus pandemic.

To a lesser degree, the social media platforms Facebook, Twitter, Instagram and LinkedIn were used. This was mostly as a tool for raising awareness about the scheme as opposed to a means of communication with stakeholders. The reach was a mix of the demographics represented within our stakeholder group.

Another outreach tool OI intend to create a is a promotional video about the pilot project. This will provide information about the recycling scheme, include interviews with fishermen and other stakeholders with the intention of increasing awareness and encouraging a greater uptake of the recycling scheme within the fishing industry.

3.5 Workshops

A lot of the above methods of communication were on a one-to-one basis which was ideal for working through the technicalities of each individual stakeholder's participation in the pilot. However, for the pilot to have maximum impact it was important to find ways of encouraging collaboration between stakeholders. The best way of doing this was through online workshops due to the stakeholders having a broad geographical spread, varying timetables and the Coronavirus pandemic.

There were two workshops that came after the initial one-to-one engagement with the key stakeholders. The first was held on the 3rd of February 2022 at 4pm, the minutes of which can be

found in Annex 5. These contain more information on the discussions than what is mentioned in this report.) The workshop had an attendance of 11 participants, unfortunately the individual fishermen were underrepresented with only one fisherman and the harbours were completely unrepresented.

During the meeting, updates regarding the pilot schemes' progress and introductions were made. Some stakeholders also expressed how they can lend their expertise and resources to help further the objectives of the pilot project. Information was given on the (then upcoming first) collection in March. A particular emphasis was placed on stakeholders disseminating information within the Welsh fishing fleet prior to the collection to ensure the success of the pilot by maximising the recyclable materials entering the scheme. Overall, there was lots of enthusiasm to collaborate and willingness to help. Time was then left for questions and feedback.

It was agreed upon that the format of future meetings would move away from individual introductions/presentations as that had been covered in the first meeting. It was suggested that a working group format would be more suitable to encourage better collaboration by having more of an open discussion-based format.

The second meeting was scheduled in the weeks leading up to the first collection on the 4th of March 2022. Unfortunately, the meeting had extremely low attendance with only 4 participants, resulting in the majority of the stakeholders not being represented. The workshop was scheduled for Friday 4pm on the assumption that fishermen may have more free time in the afternoon and that stakeholders who work more regular hours (9-5pm) would still be available. It was suggested that the low attendance may have been due to the meeting falling on a Friday late afternoon, as participants were possibly busy trying to wrap up their week's workload prior to the weekend. Another possible reason may be that for the first meeting we conducted more individual outreach prior to the meeting to encourage participation. Either way these are factors worth considering if scheduling future meetings.

4.0 PROVISION OF INFRASTRUCTURE IN PILOT HARBOURS

As mentioned above tailor made solutions are often needed for different harbours. For this pilot it was decided to keep all infrastructure relatively basic to ensure that money wouldn't be wasted on providing infrastructure that could later turn out to be inappropriate. The infrastructure that was provided was large, branded 1100ltr metal wheelie bins and 300 one-ton dumpy bulk bags (distributed equally) to store additional material. This was a low-cost way of providing a presence in the harbour and removed the need for additional harbour signage by using the skips for the

interpretation materials. Every skip had the Welsh and English recycling guidelines attached to them and acted as a focal point for recycling. In time it may be that some harbours would prefer larger skips however providing them from the outset without a clear idea of material flows could have led to logistical/storage problems.

The wheelie bins were distributed one each between Milford Haven, Fishguard, Holy head, Amlwch, Cardigan, Penhesgyn and two at Swansea. The installation date for the above infrastructure was the 12th and 13th of October 2021 and was carried out by our recycling partner at Exeter City Council. This had the additional outreach benefits through being able to meet harbour staff in person and answer any questions relating to the pilot.

5.0 COLLECTION LOGISTICS

Once initial research had been conducted and it was found that relatively low volumes of recyclable material would come through the harbours, a decision was made to coordinate collections with other nearby harbours to save money and keep CO2 as low as possible. This has the potential to be tricky to coordinate, as some harbours may produce more material and be ready for a collection prior to others along the collection route. To help overcome this problem 300 bulk bags were distributed between the harbours to use once the wheelie bins were full. An alternative option that OI have used in other regions is to place large skips in centralised locations for use by multiple stakeholders. However, this has the potential to cause quality control issues with no way of tracing where the contamination originated from. It was also not appropriate for this pilot due to the large distances between some of the harbours.

The collection frequency was dictated by the volume of material that was entering into the scheme. The recycling points were monitored by the harbour authorities for the duration of the pilot and the volumes were established through emailing the harbours to estimate the volume of recyclable material. The volume of the material was measured in the number of full bulk bag and wheelie bins. This then informed what type of vehicle would be most appropriate, along with the amount of individual collections that could be achieved per journey and the route.

The date for the collection was set for the 17th and 18th of March 2022 to coincide with the end of the project. This gave participants as much time as possible to accumulate recyclable gear, it was a total of 22weeks from dropping off the infrastructure to collecting the recyclable fishing gear. All stakeholders were given over 4 weeks notice of the collection date. This was followed

up by calls and emails closer to the time to encourage them to talk to the fleet and maximise the volume of recyclable material.

In the days leading up to the collection the estimated number of bulk bags to be collected was 23. It was thought that it could be higher as two of the harbours did not provide data on how much material they had ready for collection.

The driver behind the collection was the Net Regeneration Scheme's lead recycling partner Matt Hulland (the Resource Recovery Manager) on behalf of Exeter City Council. This helped provide valuable feedback on the implementation of the scheme as well as providing a highly knowable individual for stakeholders to engage with during the pickup. This engagement included meeting press and other key project stakeholders in Swansea to help promote the scheme which coincided with the World Recycling Day on the 18th of March 2022.

The order of collections is as follows:

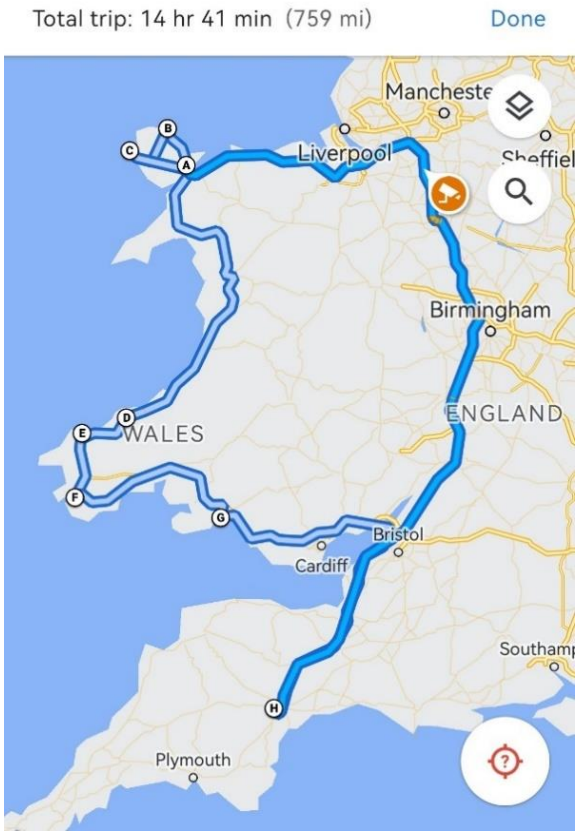
Day 1: Departed from Exeter MRF - then collected from Penhesgyn Recycling Centre - Amlwch harbour - Holyhead harbour and Cardigan.

Day 2: Collected from Fishguard, Milford Haven, Swansea and then returned to Exeter MRF.

The total distance travelled to collect from all the harbours was 759 miles.

'The total driving time (not including stops) was 15 hours.

5.1- Collections underway



5. 2 -Map depicting Collections Route

6.0 PRE-SORTING

The pre-sorting of waste is done by the participants using the scheme whilst following the recycling guidelines and by only putting recyclable materials in the bins. During this first collection the bins were checked by OI's team for contamination so this could be fed back to the relevant stakeholder. Below is the feedback:

- Penhesgyn HWRC site: was only used by Conwy and there were no contamination issues
- Amlwch: only collected 2 lobster creel pots, these are non-recyclable
- Holyhead: presented a small amount of non-recyclable litter and rags in the bin along with a net whose metal wires were still attached (should have been removed)
- Cardigan Bay: no contamination at all -the net preparation was perfect
- Fishguard: had approx. 70% contamination including heavily bio-foulded plastic drums, shrink wrap packaging, plastic packaging bands, excessively dirty rope offcuts and general waste.

- Milford Haven: the bin was heavily contaminated with water, diesel and litter.(The harbour staff moved the bin to the compound as they said it would be used by passers-by if left outside; they were informed they had a key to avoid this which turned out to be at the bottom of the bin.) There were also two bags of nets and ropes which were missed during the collection as the bags were at a different location and the staff were uncontactable.
- Swansea: no contamination issues, all the materials had been processed as per recycling guidelines.

6.1- An Odyssey Innovation wheelie bin with Welsh and English recycling instructions attached to it seemingly full of nets surrounded by recyclable whelk pots at Holyhead

6.2- Close up of contamination found in the Holyhead wheelie bin

6.3- Amwlch collection- the lobster pots are non-recyclable and mixed fragments of ropes knotted together and a can

6. 4- Holyhead collection: unsorted and entangled ropes are not accepted for recycling but are perfectly recyclable

6. 5- Fishguard Harbour Collection: A wheelie bin full of non-recyclable fishing gear due to lack of preparation; note the bio-fouling, shrink wrap and tangled ropes

6. 6- All that remained for the Fishguard wheelie bin collection that could be recycled

6. 7- Milford Haven Collection

6. 8- Milford Haven Contamination

7.0 SORTING

At the Exeter MRF, the fishing gear's gross weight was calculated on a weighbridge. The MRF acts as a recycling hub and waste transfer station where materials are segregated by type. The rigid plastic items are processed in-house and nets and ropes are separated into Trawl nets, Ropes and Gill nets; these are then bailed and stockpiled prior to forwarding onto the appropriate recycler. During the process of segregating material types and bailing at the waste transfer station OI carry out the final quality control and separate out contamination of any non-target materials. This quality control ensures we can provide recyclers with high quality materials which maximises the value of the material whilst the bailing optimises logistics costs and reduces the CO2 used in transportation. Wherever possible we also back-load our transportation which has a further CO2 saving by avoiding unnecessary road travel with empty vehicles.

During this stage of processing OI does not carry out any further preparation/cleaning of the material as this is not cost effective. However, it is worth noting that during the pre-sorting phase in the harbours most fishing gear which is too contaminated to be recycled in its current state can be recycled once cleaned with a pressure washer. Also, the same fishing gear contains component parts

that OI do not have the resources to dismantle, but some elements of these can be recycled if additional disassembly is done harbourside.

It is important to note is that the way fishing gear is stored and handled can reduce contamination. Having a secure and separate area for recycling is recommended as this can help avoid non-target waste mixing with the recyclable material and contamination with oils or other contaminants

8.0 RECYCLING

It is a common mistake to only think of fishing nets when the term “fishing gear” is mentioned, whereas this is only one type of a vast array of fishing gear. The recycling of fishing gear is important and relevant for the best practice of all members in the catching sector, as every member of the fishing industry uses some sort of gear to catch fish and marine creatures. In addition, recycling a wide array of materials assists in increasing the volumes needed to provide a frequent collection service from harbours. The recycling of different types of fishing gear is complex and running a recycling scheme involves far more than just being able to shred nets. Therefore, we use a variety of processing techniques and partners to be able to offer a comprehensive service that keeps the value of the final recycled material as high as possible.

8.1 Rigid Plastics

Substantial amounts of fishing gear are made from rigid plastic; some examples of these are whelk pots, creel pot funnels, trap floors, oyster bags, fish boxes, net bins, etc. Any rigid plastic is processed on site at the Exeter recycling hub using OI’s shredder and granulator. This processes the plastic into a 5mm< granulate which can then be used directly by manufactures or sent for further processing into a pellet suitable for injection moulding.

8.1 1 Odyssey Innovation's Shredder at Exeter City Council’s MRF

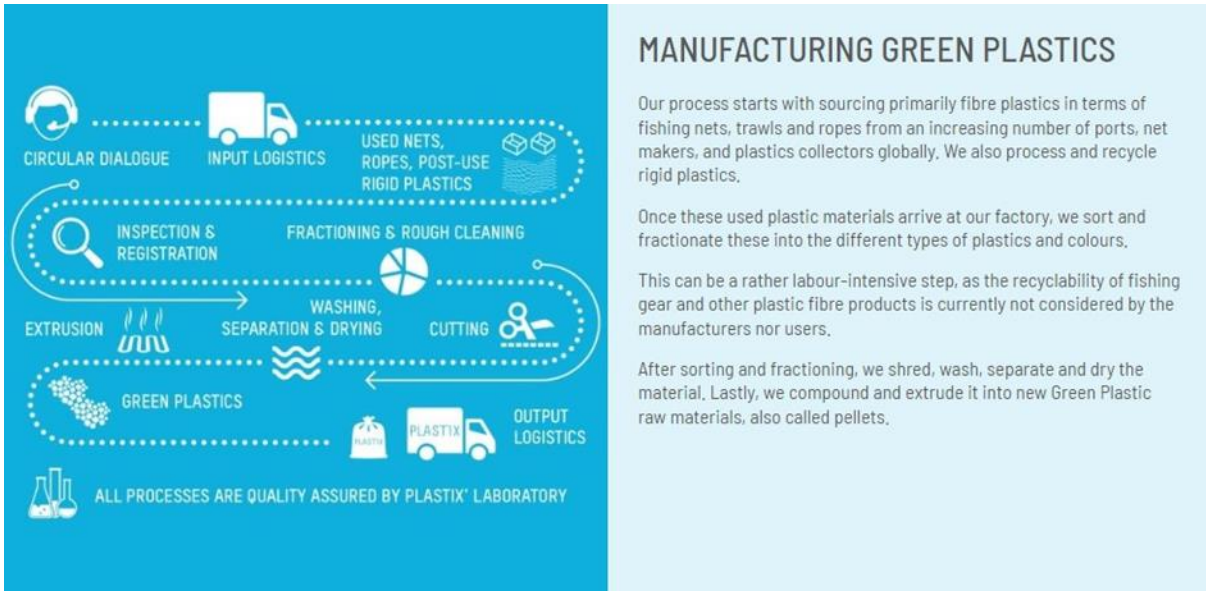
8.1 2- Examples of Granulate which can then be reused in manufacture

8.2 Nets & Ropes

The processing of nets and ropes is more challenging than that of rigid plastic; this is due to the composition of the material which causes too much wear for most shredding machinery. The multiple combination of materials found in Nets and ropes also make it difficult to process them into a consistent high grade recycled pellet that meets the specifications of manufactures.

The component parts of nets are made by multiple companies all over the world, they are often then imported into the UK and turned into the type of fishing nets local fishermen require. Unfortunately, there is no standardisation in fishing gear production materials as Plastix A/S found out in a study- they identified over 1,000 material combinations which keeps on increasing. We have trialed recycling nets in the UK with multiple large scale commercial recyclers to no success.

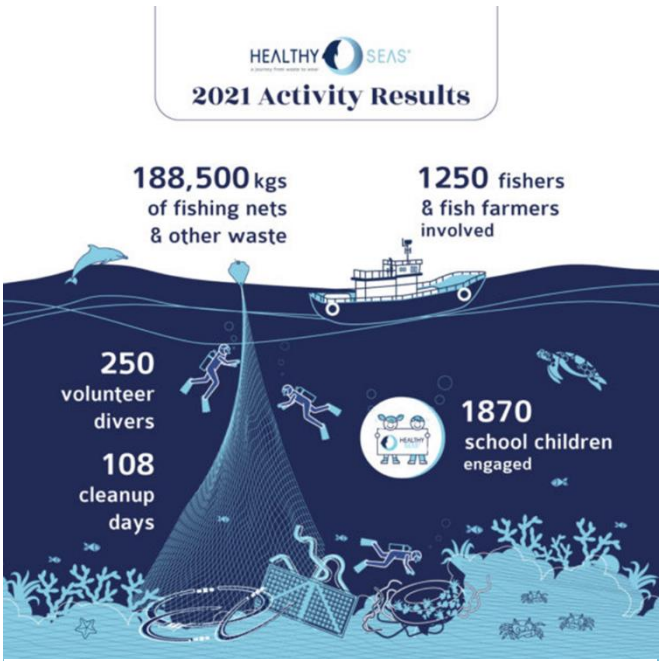
Odyssey Innovation overcame these challenges by becoming the UK representative for the largest specialist net recyclers in Europe, these being Plasix A/S and Aquafil. These companies specialise in different materials using different recycling methods. Plasix A/S are based in Denmark and recycle trawl nets and ropes which are usually made from Polyethylene and Polypropylene. They process these through a mechanical recycling technique into pellets suitable for use in manufacturing.



8.2 1- An infographic showing industry leader Plastix's circular operations

Plastix have incorporated 6 of the UN's Sustainable Development Goals as part of their business strategy and their OceanIX Green Plastic pellets reduce CO2 emissions by up to **94**% in comparison to using virgin plastic.

Our other recycler, Aquafil, are based in Slovenia, they recycle Nylon gill nets into a yarn called ECONYL® which is used in wide array of clothing items. The regenerated nylon reduces the global warming impact of nylon by up to 90% compared with producing virgin plastic material from oil. Their business supports 12 of the UN's Sustainable Development Goals. Aquafil also help recover lost fishing nets. They co-founded the Healthy Seas Foundation in 2013 who use volunteer divers to clean the seas of marine litter such as derelict fishnets.



8.2 2- An infographic showing some basic data about Aquafil's Healthy Seas Foundation

This pilot project and the wider workings of the Net Regeneration Scheme support the supply chain of materials to Plastix A/S and Aquafil and in so doing contribute towards the significant savings in CO2 that manufactures can achieve by using the recycled polymers they create. This has a positive knock-on effect by supporting other product manufacturers in a global transition towards a circular economy which in turn supports many of the UN's Sustainable Development Goals.

In addition, Odyssey Innovation work with Plymouth University on board the INdiGo project to help validate recycling routes by using life cycle assessment to confirm CO2 savings. The project is also involved in gear design with a focus on increased sustainability and recyclability.

8.3 Onward markets for recycled Polymers

The recycled raw materials generated through the Net Regeneration Scheme potentially end up with a multitude of product manufactures. The polymer type is the largest deciding factor in the final market for the material. In the case of rigid plastic the quality grade, volume and previous manufacturing techniques used also play a part in deciding the final application of the plastic. The polymer types of rigid plastic Odyssey Innovation have entering the scheme is mostly Polyethylene (PE), Polypropylene (PP), Nylon (PA) and Polyethylene terephthalate (PET).

Sometimes the plastic fragments polymer type is unidentifiable and in this case it is added into a mix of low-grade plastic. Heavily degraded rigid plastic is also added to this mix of low-grade material. This material would usually end up in landfill or incineration, however we have two markets for using this; one being the production of large plastic sheets used in construction, the other a base filler for resin bound driveways.

At times rigid plastic is divided by the type of manufacturing process that was used to create the item. This is either injection moulded, rotational moulded or blow moulded plastic. Each of these methods have different technical requirements of the original polymer such as strength, impact resistance, flexibility, melt flow etc. By categorising polymers of the same type with similar properties together, it becomes simpler to develop recycled polymers with specific properties for working with onward supply chains. An example of this would be kayaks made from recycled Polyethylene manufactured using the rotational moulding process.

It can be difficult to find companies to process small batches of plastic back into pellets and it is not cost effective, in these instances OI often process small batches of plastic into granulate. This is used

to manufacture high quality polymer specific sheet materials which can be further processed to produce a range of products from phone cases to shop fittings.

After several years OI have developed end markets for all the above and in so doing have a way of recycling a wide array of materials whilst maintaining the value of the polymers as high up the supply chain as possible, which is essential in adopting a circular economy business model.

Fishermen have on occasion reported feeling exploited when they see products made from fishing gear that contain very little quantities of material with very high profit margins. This can give a false impression of the true value of fishing gear entering recycling schemes. This is something OI bears in mind when developing their own products made from fishing gear; usually these are relevant to the fishing and conservation community as can be seen from their first product, the world's first and only recycled marine plastic kayak- designed to be used in their Paddle for Plastic campaigns to remove marine plastic and ALDFG from remote locations. Later their product range grew to encompass Bodyboards, Surfing Handplanes, Whelk Pots, Net Bins, Recycling and Litter bins. All of these are valuable in terms of Ocean Literacy and help make recycling relevant to the fishing community and beach clean groups.

8.3 1- 2 (above) Phone cover made from fishing gear that's been turned into sheets by Nurdle

8.3 3 (left) Odyssey Innovation's Net Regeneration Scheme rigid plastic turned into sheets for a Glastonbury Stage

9.0 DATA

9.1 Quantities of recyclable materials from the pilot harbours.

The total quantity of fishing gear collected for recycling was 1220kg.

Each site provided different quantities and types of fishing gear, these are:

- Penhesgyn HWRC: 3 bags of rope from Conwy
- Amlwch: 0 recyclable material supplied
- Holyhead: 1 full bin of trawl net
- Cardigan: 10 bags of mostly gill nets and some rope
- Fishguard: ½ a bag of rigid plastic and some rope
- Milford Haven: 2 bags of nets and 1 bin of beach clean litter collected by SAS
- Swansea: 2 wheelie bins of trawl nets, ropes and rigid plastic

In addition, the pilot stakeholders involved in beach cleans all had a keen interest in supplying plastic and fishing gear for recycling:

Surfers Against Sewage used the recycling point in Milford Haven and filled one wheelie bin with general beach clean plastic, some rigid plastic from fishing, nets and ropes gathered from beach cleans in Pembrokshire.

Neptunes Army of Rubbish Cleaners had only recovered creel pots during their dives which are not currently recyclable.

Keep Wales Tidy had put a hold on beach cleans due to coronavirus but are keen to start recycling through the scheme in the future.

The Marine Conservation Society didn't provide anything this time but are interested in using the scheme in the future.

9.2 Gear Types Recycled & their weights

Table 2: Gear types Collected and their Weights

Trawl Nets	233.8kg	**Gill Nets**	184.2 kg
Rigid Plastic	132kg	**Ropes**	568.4 kg
Contamination	55kg[7]	***Total***:	**1173.4 kg**

Table 3 Pie Chart depicting Different Types of Gear Collected by Percentage

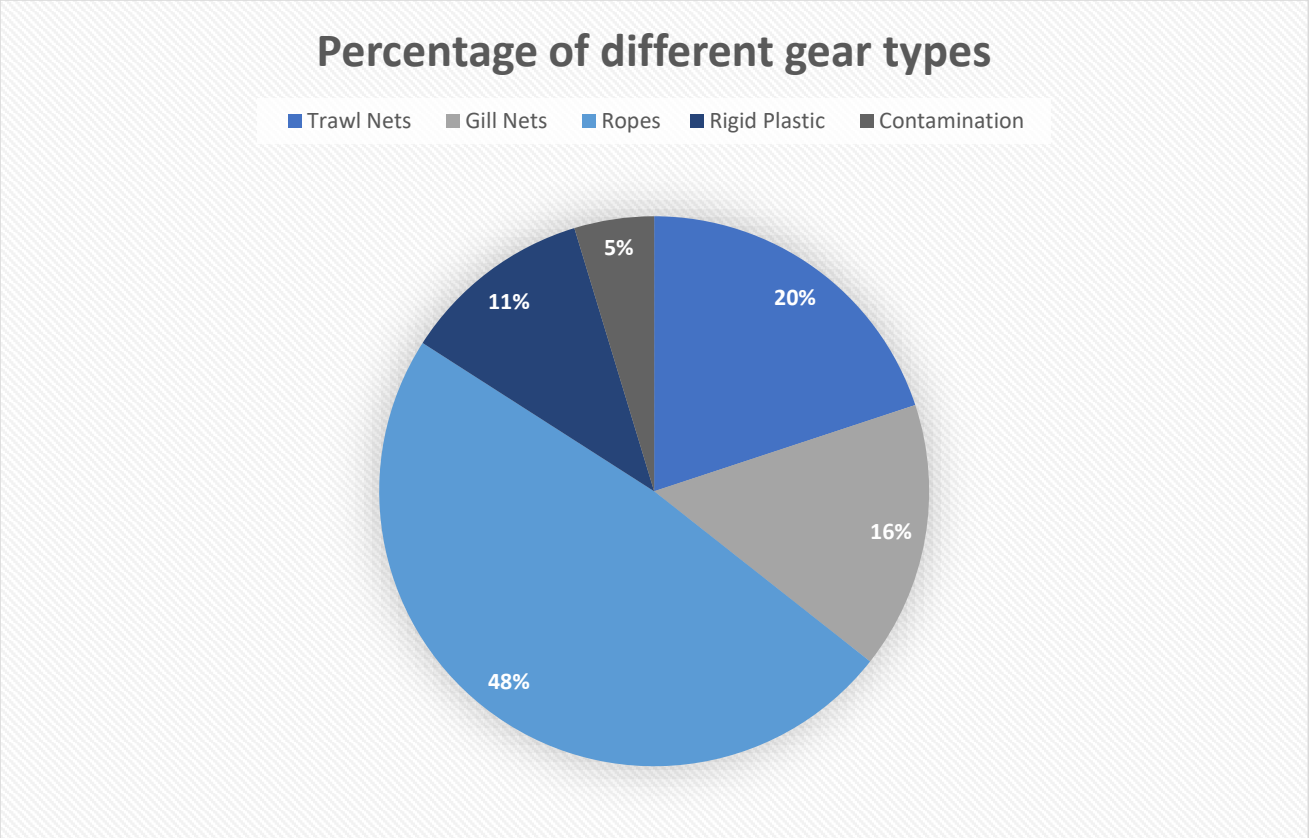


Table 4 The breakdown of quantities and type of rigid plastic is as follows:

[7] The contaminated material consisted of metal wires attached to a trawl net and rubber buoys.

Plastic drums	2	Whelk pots	3
Plastic barrels	1	Oyster bags	2
Plastic fish baskets	2	Creel pot components	4
Plastic Pallet	1	Plastic Fish Boxes	2
Other plastic	2	Plastic storage boxes	3

Table 5: Breakdown of Beach Clean Recyclable Waste collected from the bins by percentage

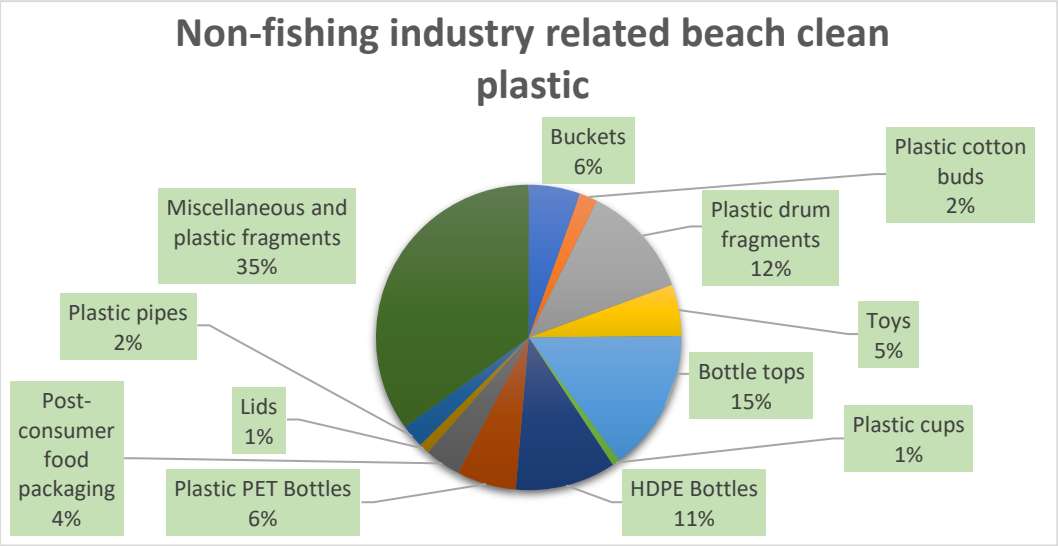


Table 6 Breakdown of Beach Clean Recyclable Waste collected from the bins

Bottle tops	55	Buckets	20	Food packaging	14
Plastic cups	3	Plastic cotton buds	7	Lids	4
HDPE Bottles	39	Plastic drum fragments	44	Plastic pipes	9
Plastic PET Bottles	23	Toys	20	Miscellaneous a	128

Photographic examples of Non-Recyclable and Unacceptable objects:





9.2 1 (above) Photographic examples of Non-Recyclable, Contaminated and Unacceptable objects

Photographic examples of Recyclable items:






9.2 2 (above) Photographic examples of Recyclable Gear

9.2 3 Weighing the Welsh Collection on our weighbridge in back Exeter

10. OPPORTUNITIES TO RECYCLE WITHIN THE WELSH WASTE STREAM

There is future potential to recycle some of the fishing gear collected within Wales as some of the companies we use to pelletise rigid plastic have sites in Wales. However, there are challenges in doing this currently:

- The Welsh recyclers process rigid plastic in bulk and there are very low volumes of this coming into the scheme from Wales
- It is not financially viable for them to pick up small quantities of plastic from remote locations
- The requirements to segregate different types of rigid plastic by polymer type would be required, this is why OI are using their recycling hub as a waste transfer station
- Quality control will pose an issue as they only purchase pre-sorted clean materials
- They are not able to process nets and ropes as this requires specialised recyclers

An opportunity for recycling some of the fishing gear in Wales could be through continuing to sort the rigid plastics in Exeter MRF (90miles away from Wales), once sufficient volumes are accumulated these can then be processed by Welsh recyclers to turn these into pellets for manufacturing. For this process, the recyclers will accept as much material as the scheme provides, irrespective of the scheme having an end market for the pellets.

Another option would be to use a company OI work with in Wales that produce plastic sheet materials, which can be used in a wide variety of products. However, they only accept pre-sorted, clean, polymer specific plastic with the correct melt flow. As a result, this would still require the plastic to go to the Exeter MRF first for sorting and testing. In this case the company will manufacture solely to order since the sheets are quite costly to produce, this limits the quantity of material that can be sent to them to the amount of sheets needed.

11. PRESS

The Pilot project received a large amount of press coverage[8]. This included news articles, social media posts, online articles and mainstream media. The first collection was covered by ITV news for World Recycling Day on the 18th of March 2022, this can be seen in Welsh Government post below along with the other press articles:

[8] See Annex 6 for Press Release

1. Welsh Gov film of the first collection https://www.facebook.com/watch/?v=1007652656530733
2. Welsh Gov Article https://gov.wales/back-net-wales-becomes-first-uk-nation-rollout-fishing-gear-recycling-scheme
3. Odyssey Innovation Facebook post https://www.facebook.com/odysseyinnovation/posts/pfbid08am55nLTRKsRUijU1vWhZVn2DZWj2RoVfmi8Ekke6ijJ3WqXeKscJ6zmE24YYNbSl
4. Circular for resource and waste professionals https://www.circularonline.co.uk/news/global-recycling-day-wales-rolls-out-fishing-gear-recycling-scheme/
5. Fisker forum https://fiskerforum.com/wales-rolls-out-fishing-gear-recycling/
6. Swansea bay news https://swanseabaynews.com/2022/03/18/back-of-the-net-wales-becomes-first-uk-nation-to-rollout-fishing-gear-recycling-scheme/
7. Tenby Observer https://www.tenby-today.co.uk/news/milford-haven-among-seven-welsh-harbours-to-pioneer-fishing-gear-recycling-scheme-543227
8. The Fishing Daily https://thefishingdaily.com/latest-news/welsh-fishermen-tackle-marine-plastic-and-climate-change/
9. Scubaverse https://www.scubaverse.com/welsh-government-offers-free-fishing-gear-recycling-to-welsh-fishing-community/
10. Green Business Journal https://greenbusinessjournal.co.uk/wales-becomes-first-uk-nation-to-rollout-fishing-gear-recycling-scheme/
11. Twitter post https://twitter.com/Welsh_Fishermen/status/1509465423703642115
12. Daily Post https://www.dailypost.co.uk/news/north-wales-news/north-wales-briefing-health-ministers-23428145
13. Western Telegraph https://www.westerntelegraph.co.uk/news/20003623.milford-fishguard-cardigan-play-major-role-clear-up/
14. Ireland Business News https://irelandbusinessnews.com/north-wales-briefing-well-being-secretarys-pace-ban-recycling-of-fishing-gear-and-jobs-dispute-in-council/
15. Welsh Parliament https://record.senedd.wales/WrittenQuestion/84330
16. In Your Area https://www.inyourarea.co.uk/news/fishing-net-regeneration-scheme-pioneered-in-cornwall-taken-up-by-welsh-government/
17. Recycle Link Wales https://twitter.com/RecycleWales/status/1509513865666646022
18. Marine Industry News https://marineindustrynews.co.uk/welsh-harbours-to-benefit-from-net-regeneration-scheme/
19. Communications and Management for Sustainability http://www.cmscoms.com/?p=28825

20. Linkedin post
    https://www.linkedin.com/feed/update/urn:li:activity:6862391355126149120/

12. DISCUSSION

12.1 Communication

During the pilot it was necessary to use a variety of communication methods depending upon the participants preferences. The mixed successes of the scheme's regional implementation highlight the importance of effective communication between stakeholders with each other and the scheme operator. Reaching individual fishermen is essential to the success of a recycling scheme. However, due to the nature of fishing activities (causing irregular hours and routines) it proved particularly challenging to engage with them. Even during the two site visits for dropping off the infrastructure and collecting the recycling, it was usually only by chance if an opportunity to talk to a fisherman would present itself. Therefore, going forward other stakeholders assistance in reaching individual fishermen is essential. It is especially important that harbour management teams disseminate information to their fishing fleet or alternatively they could provide contact details of members of the fishing community. Fishing associations could also be very useful in helping reach fishermen through disseminating outreach information to their membership.

A communication tool that was not used as a primary means of interaction but proved successful was social media. The harbour that provided the pilot with the most materials was Cardigan and the initial contact was made by a member of their fishing community reaching out to OI through Facebook. Initially the harbour expressed disappointment through social media about not being included within the pilot scheme and subsequently OI reached out to the harbour's representatives to discuss their inclusion. Participants enthusiasm and goodwill is essential for the success of the scheme and to capture this an additional collection point was added in Cardigan.

This experience highlights that it worth considering using social media as an outreach tool to reach individual members of the fishing community. Generating engaging relevant content of interest is valuable in reaching individuals, as such OI plan on using the video of the Wales pilot to reach additional members of the fishing community through social media.

Whilst the online workshop had mixed success it still has good potential as a communication tool in encouraging stakeholder collaboration; it is worth trying again using different days and times. A workshop for discussing the contents of this report with the pilot stakeholders could be useful.

12.2 Recycling rates

The recycling rates were lower than expected, not capturing the whelk pots for recycling was a major contributing factor- this was the primary fishing gear type the pilot targeted based on the estimated annual volume of end-of-life fishing gear generated by the Welsh fleet which identified a potential 11,158kg of plastic from whelk pots. One of the reasons for not receiving any whelk pots may be the assumption that fishing gear recycling is just referring to nets. Feedback from the initial outreach suggested this, some of the harbour staff stated that recycling schemes are not applicable to them as their fishing fleet don't use nets. It took further discussions to inform them of the materials that can be recycled. This suggests that sometimes the content of the recycling guidelines are being missed or not reaching the appropriate members of the fishing community. As such outreach with the individual whelk fishermen so they are aware of the recycling options would be valuable.

Another potential obstacle to capturing the whelk pots was reported to us by the harbour team at Amlwch who said that their fishermen would not do the work to remove the concreate weights from the pots for recycling. They stated that this made recycling unlikely to happen and agreed to remove the recycling infrastructure altogether so it could be allocated elsewhere.

The greatest amount of fishing gear type received was ropes weighing a total of 568.4kg. This was not identified as a potential recyclable waste stream from fishing gear in the initial material flow analysis. The reason for this may be that the original material flow data did not consider all component parts of fishing gear or there may be very little data available on the frequency of ropes being replaced. Either way there is a potential for ropes to be a significant proportion of the fishing gear entering the recycling scheme.

An interesting observation that came from the experience with Cardigan was that during the initial material flow research indicated that they had a low potential for recycling based on the smaller fleet and catch size. As it turned out Cardigan supplied the greatest volumes for recycling from multiple members of the fishing fleet and all the material was prepared correctly with no contamination. This suggests that the harbours with the greatest potential to supply materials based on the quantity of gear being used, are not necessarily the ones that will provide the most material for recycling.

The assumptions based on material flow data are not necessarily inaccurate, they act as a good indicator of potential volumes when considering expanding a scheme into new regions. However, there are other considerations that need to be considered that influence the success of a scheme. The main elements that are needed to run a fishing gear recycling scheme are:

1. Establishing reliable and robust recycling routes that are comprehensive in the array of fishing gear that can be recycled through them

2. Financing the running costs of recycling schemes that act as a service provider

3. Behavioural change within the fishing community is essential to making fishing gear available for recycling. This can come from good will, incentives, local authority recycling targets or legislation

The behavioural change factor is often overlooked but proves essential as when the fishing community are not engaged with the concept of recycling in a harbour it is highly unlikely to happen. Through the previous experiences of Net Regeneration Scheme, the lack of legalisation making it a requirement to recycle means that schemes rely purely on the good will of their participants. As a result, the greatest factor in a harbour that influences a recycling scheme success is having participants on-the-ground that are keen to make the scheme work.

Conway and Swansea had similar experiences to Cardigan as they also had members of the fishing community engaged and enthusiastic to make the scheme a success. Likewise, these both had comparatively high recycling rates as well. This backs up the assumptions that on-the-ground participants are key in having high recycling rates. However, schemes that are purely reliant on goodwill for their success have their limitations as participants willing to work on this basis cannot be found in every harbour. This results in unpredictable volumes of materials entering recycling schemes and makes capturing all EOL fishing gear impossible. Therefore, additional behavioural change measures or incentives should be considered essential in enabling the capture of the largest percentage of EOL fishing gear.

This pilot supported the recycling of 366 pieces of marine litter gathered from beach clean activities that otherwise would have ended in incineration or landfill. This is a good example of a cross-sector symbiotic relationship between conservation groups and the fishing industry who are both working towards the same aim of reducing marine plastic.

12.3 Recycling

The contamination rates of the materials were relatively low and to be expected during a trial as the participants get to grips with a scheme. The NRS lead recycling partner oversaw the first collection to identify any teething problems, intercept any contamination prior to collection and feedback any issues -this was an additional measure that cannot be relied upon happening every time. If participants are willing, the contamination rates will naturally reduce as stakeholders become more familiar with the schemes requirements.

The rationale behind the NRS choosing to use specialist net recyclers based outside of the UK, is that these companies have invested heavily in R&D to recycle a material which is globally renowned for being problematic. They both support many of the UN's Sustainable Development Goals and their recycled pellets save between 90 - 94% of CO2 over using virgin plastic. As recycling rates are extremely low for fishing gear in the UK the greatest CO2 savings can be made by prioritising increasing recycling rates through using these established recycling routes. Another consideration is that Plastix and Aquafil have established markets for the recycled material and a demand that is growing. This makes increasing recycling supply chains a lot less risky than using recyclers that do not have established markets in place, as it avoids a potential scenario where the market for the material could slow down or collapse which would prove catastrophic to a recycling scheme.

13. OPPORTUNITIES

A benefit of the Net Regeneration Scheme having the ability to recycle a wide array of EOL fishing gear is that it optimises CO2 savings by diverting waste from incineration and landfill. These savings can be increased further by scaling up to offer recycling to more stakeholders. The additional potential stakeholders that have been identified in Wales are:

- Additional members of the fishing community in Conwy. These are requesting their own on-site infrastructure, so they do not have to travel to the Penhesgyn HWRC. The plan is to move the bin from Amlwch to Conwy.
- Members of the fishing community in Conwy have suggested Pwllheli Marina as an additional recycling location
- Nefyn Harbour could be added on a collections route with Pwllheli
- Aberystwyth is on the recycling route to Cardigan so it is worth considering for recycling
- Menai Oyster and Mussel farm
- The Fishing For Litter scheme as the NRS already recycles some of their waste in the SW of England

An opportunity to significantly increase recycling rates is to find ways of engaging any fishermen who are whelk fishing, as well as finding ways of capturing the other rigid plastic from harbours.

Another potential addition to the Wales recycling scheme could be supporting recreational crab line recycling. The NRS already recycles for the scheme elsewhere and has made introductions to the scheme organisers through the workshop. The scheme is proving very successful and in the space of a year thousands of crab lines have been recycled creating viable volumes for recycling.

13.0 1- A photo showing a couple of dumpy bags full of Crab Lines. To see their granulate form please see Annex 4

13.0 2- Rob Thompson from Odyssey Innovation next to the Preventing Plastic Pollution Angling Line bins which are scattered throughout Plymouth and which are recycled by OI

The NRS also works on the Preventing Plastic Pollution project in Plymouth as a contractor to Plymouth City Council for their angling line recycling project. Stakeholders in Wales have shown an interest in angling line recycling and have stated that fishing line makes up a big proportion of their fishing litter.

A way of increasing awareness of the Welsh recycling scheme and giving context to the concept of recycling fishing gear would be for OI to supply relevant products back to the fishing communities made from recycled fishing gear. Examples of recycled products that could be provided are net storage bins, recycled ropes, whelk pots or infrastructure like litter bins and recycling bins.

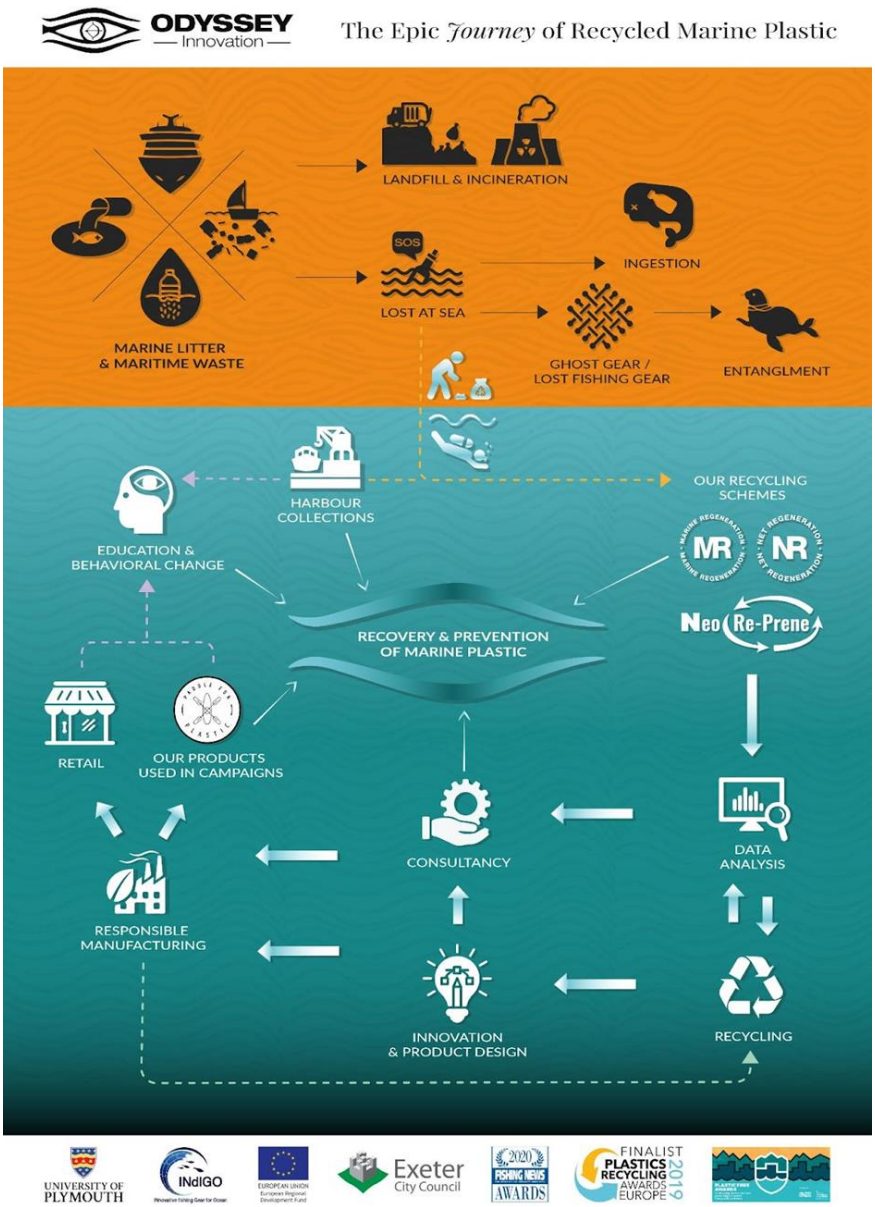
13.0 3- Odyssey Innovation's Net Bins made from recycled fishing gear; these were made for fishermen in Cornwall to help understand the Circular Economy

13.0 4- Odyssey Innovation's Whelk pots made from recycled fishing gear; these were made for fishermen in Cornwall to help understand the Circular Economy

13.0 5 - Odyssey Innovation's various bins supplied to councils, harbours and marinas made from recycled fishing gear; these were made for fishermen in Cornwall to help understand the Circular Economy

13.0 6 - Odyssey Innovation's bins supplied to Fowey Harbour, Cornwall made from recycled fishing gear

The potential expansion of the fishing gear recycling pilot in Wales supports a transition towards a circular economy for maritime waste and fishing gear within Wales. An example of how a circular economy for fishing gear can look can be seen in the below infographic:



13.0 7 - An infographic showing Odyssey innovation's circular operations

14. CONCLUSION

Although recycling rates were lower than expected, the pilot successfully demonstrated how a recycling scheme for fishing gear could be achieved and implemented in Wales. The scheme demonstrates the importance of using recycling pilot projects to assist in informing national strategies for dealing with EOL fishing gear. Many of the challenges encountered could not have been anticipated in desktop feasibility studies. Desktop studies have their place in providing data such as assumed potential material flows, which can be used as an indicative starting point for a pilot project. However, they have their limitations as only pilot studies can identify most of the nuanced challenges to establishing regional recycling schemes and capture a clear impression of the potential for recycling in the UK.

Several lessons were learnt through the pilot which will assist in the implementation of a permanent fishing gear recycling scheme. The most apparent being that establishing recycling routes and removing the financial barriers to recycling is not enough in itself. Facilitating behavioural change is a crucial third element that is essential to a scheme's success which is often overlooked and undervalued.

It is essential that recycling is free to fishing communities. However, fishing gear consists of different materials which mostly have a low recycling value. This results in it not being finically viable to recycle the majority of fishing gear. The logistics costs especially from remote locations or regions containing low value material (as is the case for the most of Wales) compound this problem. To create viable recycling routes, it is necessary to work on scale to build sufficient volumes to provide frequent collections. However, expanding into new regions to increase volumes often increase the financial losses of the scheme. The total value of the mixed fishing gear collected during this pilot to a recycling scheme would be worth approximately £120-£180. This does not include the costs of further processing or forwarding which would need to be deducted from the total. It is evident that for reliable and scalable recycling schemes to function they need to be run as subsidised service providers.

The economic benefits of recycling schemes are that they assist in a reduction of gear loss which helps create healthier catches for fishermen. Recycling helps the fishing industry improve their overall impression within the local community, with consumers and the media. The recycled materials that are generated through recycling schemes support recycling and manufacturing industries leading to job creation.

The pilot clearly has the potential to be rolled out successfully throughout Wales. This would contribute towards; the improvement of water quality, reducing Co2 emissions caused by manufacturing, demonstrating best practice for the Welsh fishing fleet, and assisting in a transition towards a circular economy.

ANNEX

Annex 1: Global Ghost Gear Initiative Letter of Endorsement

Global Ghost Gear Initiative c/o Ocean Conservancy
1300 19th Street, NW, 8th Floor
Washington, DC 20036

May 25, 2021

Re: GGGI Endorsement for Odyssey Innovation

Dear Mr. Thompson,

On behalf of the Global Ghost Gear Initiative (GGGI), I am pleased to confirm our official support and endorsement for Odyssey Innovation's Net Regeneration Scheme in the UK.

The GGGI is a collaborative, cross-sectoral alliance of stakeholders from fishing industry, private sector, non-governmental organizations, intergovernmental organizations, corporations, governments, and academia dedicated to tackling ALDFG at a global scale. Launched in September 2015 and founded on the best available science and technology, the GGGI aims to improve the health of marine ecosystems, protect marine life from harm, and safeguard human health and livelihoods. The GGGI's strength lies in the diversity of its 100+ member organizations, including the official support from 18 governments and many intergovernmental organisations such as the European Directorate General for Maritime Affairs and Fisheries (EC DG MARE), OSPAR Commission, and the Fisheries and Agriculture Organization of the United Nations (UN FAO). As part of our collective impact, we contribute to the objectives of the Global Partnership on Marine Litter (GMPL) as well as to the delivery of many of the UN Sustainable Development Goals of the 2030 UN Agenda.

After a thorough review by the GGGI Solutions Working Group, GGGI Expert Advisory Council and GGGI leadership team, we find the project submitted by Odyssey Innovation to align with the GGGI's overall mission and goals as outlined in the GGGI Ghost Gear Project Guidance. As the first net recycling project to be conducted successfully in the UK and with a strong track record of success since 20217, the Net Regeneration Scheme from Odyssey Innovation is a natural fit for GGGI endorsement. The project is working with and has support from fishers on the ground and numerous fishing harbours, providing a no-cost recycling solution for fishers to dispose of their end-of-life nets, which aligns well with the GGGI project blueprint.

Our assessment indicates this project has a realistic budget and timeline, based on our previous experiences with net recycling operations around the world. The project involves fishing communities that are ready and eager to implement such a recycling program, which increases its chances of continued long-term success. There is also strong potential to collaborate with other organizations, NGOs and GGGI members in the region to further increase the likelihood of further success. The GGGI only supports projects with holistic goals and methodology and in our view, this project has both. We are pleased to offer our official endorsement for this project.

Yours truly,

Ingrid Giskes
Director, Global Ghost Gear Initiative

Annex 2: Official Plastix LCA and Carbon Footprint study

PROVICE

Betonvej 10
4000 Roskilde
Telefon +45 2208180
www.provice.dk

To:	Plastix A/S
From:	Tomas Sander Poulsen, Provice
Date:	16. march 2022
Subject:	Carbon Footprint for OceanIX® - Executive summary

Background
This memo summarizes the *carbon footprint* for Plastix' Green Plastics branded under the Trademark OceanIX®.

The carbon footprint is extracted from an LCA-screening conducted during Q1-2022 and developed according to the ISO 14040-14044 standard for Life Cycle Assessment. The SimaPro LCA-software is the applied tool for the LCA-calculations. Background information and data is described in a separate document.

The LCA-screening is based on Plastix' actual production data and the results are presented as average figures for OceanIX®.

Unit and system
The LCA-screening comprise the following life cycle phases (cradle to gate):

1. Transport of plastic waste/input supply
2. Plastix production (energy, waste, additives)
3. Electricity and district heat production
4. Waste disposal

The carbon footprint represents *1 ton OceanIX® (rPPC or rHDPE) ready for sale*. While there are no differences in the production of OceanIX® rHDPE or OceanIX® rPPC the carbon footprint is representative for both polymer types.

The carbon footprint is calculated for these two product types:

- Basic OceanIX® with no compounded polymer additives
- Standard OceanIX® with 2% compounded polymer additives

Results
The carbon footprint for Basic OceanIX® rPPC and rHDPE is *126 kg CO_2 equivalents/ton*.

The carbon footprint for Standard OceanIX® rPPC and rHDPE is *168 kg CO_2 equivalents/ton*.

The reference carbon footprint for Virgin PP is 1,980 kg CO_2 *equivalents/ton*.
The reference carbon footprint for Virgin HDPE is 1,992 kg CO_2 *equivalents/ton*.

On that background, it can be concluded that:

- The Carbon Footprint for Basic OceanIX® is **93,64% less** than Virgin PP
- The Carbon Footprint for Basic OceanIX® is **93,68% less** than Virgin HDPE
- The Carbon Footprint for Standard OceanIX® is **91,52% less** than Virgin PP
- The Carbon Footprint for Standard OceanIX® is **91,57% less** than Virgin HDPE

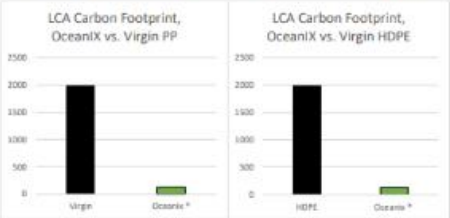


Figure 1: Basic OceanIX® rPPC/rHDPE carbon footprint vs. Virgin PP and HDPE (kg CO_2/ton)

In relation to both Basic OceanIX® and Standard OceanIX® the three largest CO_2 contributions come from transporting input supply to gate, waste incineration of production waste and diesel consumption from exterior moving equipment.

The CO_2-emissions from Plastix' energy consumption (electricity and district heating) is absolutely marginal. Plastix uses 100% certified green electricity (CO_2 compensated) and district heating is produced on biogas which is a CO_2 neutral energy source.

Annex 3: The Net Regeneration Scheme's Recycling Guidelines in English

ODYSSEY Innovation

Marine Plastic Recycling Guidelines

www.odysseyinnovation.com

WE ACCEPT

- polypropylene polyethylene - rigid plastic
- plastic bottles and caps
- plastic food containers
- plastic toys
- plastic buoys
- plastic drums
- floating pontoons
- whelk pots (nets and weights removed)
- net bins
- plastic crates
- loose rope (bagged separately and free from contamination)
- gill nets (bagged separately from ropes)
- net trimmings / fisherman's kisses (if bagged separately)
- trawl nets (if stripped of metal and rubber and bagged separately or in a bundle)

NOT ACCEPTED

- rubber
- general rubbish
- sanitary products, cotton buds
- polystyrene
- heavily contaminated materials
- traps/pots
- containers with any contents or contamination inside/outside
- glass
- fiberglass
- metal
- lead-lined ropes

About the Marine Regeneration Scheme

MARINE REGENERATION · MR · MARINE REGENERATION

Globally only 9% of plastic waste is recycled, 12% is incinerated, whilst the remaining 79% is either sent to landfill, stockpiled in developing countries or dumped on land or in the marine environmentt. This is not due to the lack of recyclability but a lack of recycling infrastructure and consumer demand. In 2016, Odyssey Innovation pioneered the UK's first marine litter recycling scheme to counteract this issue. By adopting a circular economy business model we add value to the recovered plastic by creating award--winning sustainable products and by doing so, change the way marine plastic is viewed, 'from waste to resource'. The MRS collaborates with numerous communities across the UK to recycle marine plastic, including plastic recovered via its Paddle For Plastic campaign.

About the Net Regeneration Scheme

NET REGENERATION · NR · NET REGENERATION

Whilst the MRS scheme works to support communities in the recovery of marine plastic, the NRS offers preventative solutions and tools to facilitate behavioural change within the fishing industry. It does this by offering free recycling facilities for end-of-life fishing gear and marine plastic in a traceable and sustainable manner whilst being an excellent alternative to sending gear to landfill, incineration or to it being abandoned. By removing cost barriers the scheme also supports fishermen to collect lost fishing gear and marine plastic waste whilst out at sea further supporting sustainability within the fishing industry. For more info kindly contact **recycle@odysseyinnovation.com.**

Follow Us @OdysseyInnovation @NetRegeneration @PaddleforPlastic

UNIVERSITY OF PLYMOUTH · INdIGO Innovative fishing Gear for Ocean · EUROPEAN UNION European Regional Development Fund · Exeter City Council · 2020 FISHING NEWS AWARDS · FINALIST PLASTICS RECYCLING AWARDS EUROPE 2019 · PLASTIC FREE AWARDS

Annex 4: Crab Line Granulate

Annex 5: Workshop 1 Minutes

Thursday 3rd February 2022 4pm
Net Regeneration Scheme – Wales – Working Group Minutes

Participants:

Rob Thompson
Anna Strzelecki
Mark Bloomfield
Marion Warlow
Amanda Burton
Amelia Bridges
Carl Davies
Jim Evans
Eve Gadd
Gus Caslake
Matt Hulland
Noemi Donigiewicz

1. Rob gave an overview of Odyssey Innovation and the expansion of the recycling scheme into Wales.

2. Mark Bloomfield from Welsh Government discussed what they are doing on a governmental level and why they were interested in running this pilot project.

3. Rob highlighted the time sensitivity involved as that the pilot project officially runs out on the 31st of March 2022 – we need to try and increase the outreach to get more stakeholders onboard and to increase the material flows because to get as much material through this scheme as possible. How we could potentially increase the outreach through that, so one of the points that came up was supplying material that can be circulated.

4. Planning on doing a collection from all ports in the beginning of March – date to be confirmed.

5. Rob stated that we really need everyone now to be pulling out as much gear as possible and for everyone to be aware of the scheme. We need harbour masters to be circulating the information and making sure all fishermen are aware that the scheme exists and what they need to do to participate.

6. Amanda Burton discussed the Indigo Project and how the net regeneration scheme works in partnership with the indigo project. A project based around the data collection side of what we are doing and a larger picture of how this helps creating solutions. Through looking at potential gear design challenges, how to increase recycling rates, build recycling infrastructure and any other challenges that come along with that. Also, the circular Economy – potential products that these materials could go back into and how the circular economy can support things like recycling fishing gears

7. Matt Hulland from Exeter City Council talked about our recycling partnership and what they do as a council to recycle household waste and how that works with our recycling schemes. They take waste and turn it into a commodity that they can then trade on the market, which is what we are trying to do as well when it comes to fishing gear.

8. Rob mentioned the challenges in running fishing gear recycling schemes that as far as a normal recycling scheme goes, it has all the most challenging elements. Low value material, challenging to recycle and remote locations. He discussed how they've overcome some of those challenges by working with specialist recyclers, Plastix in Denmark and Aquafil in Slovenia for fishing nets and ropes. In addition they have their own in-house capacity for recycling of any rigid plastics.

9. Rob discussed regional differences between the different areas they work in, and with wales, one of the things that was highlighted by Mark Bloomfield was that the ports that were targeted were predominantly welk fisheries. The whelk pots can be recycled through the scheme, to recycle them the requirements would be taking any netting off and knocking the weights out so we are just getting the rigid plastic elements. The scheme can also accept separated ropes along with anything else that is on the recycling guidelines.

10. Amelia Bridges talked about the crab line recycling scheme and how that has been replicated and the potential to replicate that in Wales as well and bring in some of the Welsh harbours. Discussed how the scheme is recycling that material in house.

11. Fishing line recycling scheme – A recent one for the Net Regeneration Scheme, the bins went out last month and they are now working towards recycling angling lines as well. Looking at potential scope for Wales as well if any partners are interested.

12. Rob discussed how the scheme could work with the different beach cleans groups, how we can start tying in with different beach cleaners and letting them know where the bins are is going to be important. Checking with the harbour masters, that when the beach clean groups come forward are they happy for these people to go on site and add the waste into their bins.

13. Anna from Surfers Against Sewage – whether we could do any small-scale design work around the fishing gear we are collecting and get it recycled back into products locally.

14. Mark Bloomfield mentioned trying to create something specific to Wales that was created from Welsh fishing industry waste – He suggested bins which is something that we can do, but traceability is a challenge due to the processors we are working with work on very large scales, so it is very difficult to have that traceability back to an exact region. However, on smaller scale projects it is possible. Examples of how this has been done in the past with the likes of Josh from Nurdle, making sheet materials. These can then be used by innovators to create different products that can be created from sheets using CNC routing and laser cutting etc. They are creating

things from phone case backs, to medals and anything that can be created from sheet material.

15. Amanda Burton stated that they have a design challenge through Plymouth university with small grants available to any innovators that might be interested in trailing our materials. They could potentially circulate that and possibly tie in with a creation of some sheet materials. One suggestion could be that they create sheets from some of the material that we collect and that can go back to innovators in the welsh community that want to try and create products from those sheets.

16. On a larger scale another thing Amanda mentioned was that Plastix, after some considerable product developments they have managed to close the loop on ropes by creating new ropes out of old ropes. This is something Odyssey Innovation has been interested in trialling with some local members of the fishing community. Fishermen could donate old ropes to the scheme and Odyssey Innovation could potentially purchase the new recycled ropes back. Traceability will be a challenge due to Plastix working on a very large scale so being able to say the exact same ropes that were collected from wales are being used is going to be a challenge. However, we can say that our ropes are being collected from Wales and they are being sent to Plastix and recycled into new ropes used by fishermen. Rob would be very interested in hearing more from anyone interested.

17. Carl Davies from Conway talked about challenges he's having, he's collecting waste for us and taking it to the Menai bridge site, ideally he would like to have some bins on site. He doesn't want to be moving other fishermen's waste but he thinks there is interest there with other fishermen as well. If we had a site in Conway dedicated to this it would be beneficial, this wasn't something that was provisioned for originally but we will discuss internally and see if we can create a provision for this. A suggestion to start would be giving them dumpy bags so we can do a collection from Conway. The provision of a bin would be a bit more of a challenge, we would look at how we can do that.

18. WFA, we had Marion and Jim attend. Jim was very keen on trying to help promote the scheme to increase its impacts. Odyssey Innovation will provide some materials for them to circulate to the fishermen on the ground. It was noted that often if we only engage with the harbour masters information may not get circulated beyond that, as a result on-the-ground outreach with the fishing community is important.

19. Gus - Richard Caslake highlighted that one of the challenges with the fishing industry is that gear has been designed for durability and not recyclability. Which poses a challenge especially when it comes to some types of gear like pots and traps, they are over engineered in a way that makes them not viable to recycle. Data comes in useful as knowing the potential of end of life pots out in circulation could help prove the need for looking at design challenges around this type of fishing gear. Initiatives like the indigo Project are looking at redesigning fishing gear and the work that Seafish Cefas do on the design of fishing gear could be key in finding a solution. There are elements of pots and traps that can be recycled, mostly any plastic elements that can be pulled off and put into our recycling channels. Examples would be entrances

and any plastic or ropes can be recycled. The actual trap themselves with the metal and rubber elements and nets tied it is quite often not viable. With exception of the whelk pots which for us are relatively easy to strip down and recycle.

20. Jim mentioned that the objectives of the Net Regeneration Scheme was aligned with the way everything is going anyway and there is more of a need for port reception facilities. This is being noted more on a national strategy level and that there is a need to be more participation from different stakeholders to make it happen. It was seconded by Gus, who mentioned that fishermen need to become more involved to try and make recycling schemes happen and Rob mentioned that the good will of the participants is fundamental for a recycling scheme to be successful. Goodwill is a difficult thing to quantify but support of our members is something that makes the schemes work.

21. Amelia mentioned how they use goodwill support with the crab line recycling scheme and rely heavily on volunteers, it is a labour-intensive thing to be stripping out the crab lines. Gus mentioned we had done that before with the commercial fishing waste to get the first trials through. Rob said that this is something we quickly moved away from due to the health and safety implications of having volunteers working on commercial fishing gear whilst using knives etc. The Net Regeneration Scheme doesn't encourage volunteers to work on commercial fishing gear. Although the beach clean groups often do for collecting waste off beach cleans and sorting to be put into recycling.

22. Rob mentioned that in finding the perfect solution for dealing with the waste from fishing gear there are a multitude of challenges that we face and that it's something we are not going to find a solution for straight away. It is something that needs work by different stakeholders, it's a multifaceted problem and we need a cross-sectoral approach to be able to find solutions.

23. We discussed turning the meeting into a working group. We then moved over to a discussion format and this is the agreed format in which we intend on using going forward. Once monthly meetings were agreed upon for 1 hour duration. This will be an opportunity for different stakeholders to discuss the different challenges they are facing and see collaborative solutions can be found. One particular example that was raised was that we don't currently have a solution for Lead lines. Other things that have been flagged up previously have been, rubber, which the university has been looking at finding recycling routes for as well as Exeter City Council. Collaboration between different sectors is going to be valuable in solving some of these issues. This is why we have used this opportunity to set up a working group and will be taking future meetings forward in the working group format.

06 October 2021

Welsh Government Takes Action By Supporting the Expansion of The Net Regeneration Scheme® to Offer Free Recycling of Fishing Gear to the Welsh Fishing Community.

In Brief:

- The Net Regeneration Scheme is the first of its kind and has seen fishermen in the UK's South West region recycle a wide array of fishing gear for free over the past 6 years. So far the scheme has recovered and recycled over 200,000 kilograms of fishing gear.

-The Net Regeneration Scheme, one of 3 recycling schemes offered by Odyssey Innovation is aimed at harbours, fishermen, fisheries and net makers across the UK and aims to promote behavioural change by supporting stakeholders through offering preventative measures in order for them to be part of the solution to cleaner and safer seas

- The Welsh government along with Odyssey Innovation Ltd. will be implementing a small-scale replica of the Net Regeneration Scheme to serve as a pilot project focused on creating free port reception facilities in selected Welsh harbours to recycle fishing gear and in doing so will help support the fishing community in tackling marine plastic

-The pilot project will also be engaging with several Welsh stakeholders such as fishing gear manufacturers, charities and beach-clean communities to maximise the benefit of the scheme to the local community and environment

-Part of the ocean-bound plastic coming through this scheme is then processed to be used by Odyssey innovation's own award-winning eco-friendly products, the latest of which is a body surfing handplane.

-Participating harbours are Milford Haven, Fishguard, Cardigan, Amlwch and Holyhead; members of the community include Surfers Against Sewage and Keep Wales Tidy amongst others (tbc).

Globally only 9% of plastic waste is recycled; 12% is incinerated, whilst the remaining 79% is either sent to landfill, stockpiled in developing countries or dumped on land or in the marine environment. The UN expects the amount of plastic in oceans to treble in the next 20 years. All this is not due to the lack of recyclability but a lack of recycling infrastructure and consumer demand. For this reason, Odyssey Innovation has been pioneering new solutions to prevent further ocean plastic pollution by offering support to the fishing community, beach clean groups, governmental bodies and eco-warriors alike through various free sustainable incentives.

In response to the threat caused by the marine litter crisis Welsh Government has teamed up with the marine waste specialist firm Odyssey Innovation Ltd, creators of the Net Regeneration Scheme, in an unprecedented project for the Welsh fishing communities to offer a sustainable solution for end of life fishing gear such as whelk pots, buoys, ropes, net, floating pontoons and any other recyclable plastics.

Odyssey Innovation's Net Regeneration Scheme is the only scheme in the UK that offers free net recycling solutions of Polyethylene trawl, Nylon and other plastic generated and recovered by the fishing industry. Everything that can be recycled in the UK is recycled locally and we use specialist recyclers in Europe to recycle any problematic materials. To date, the scheme supports the ambitions of more than 60 stakeholders (companies, harbours, fisherfolk and charities) to adopt a best practice approach to waste disposal which is fully traceable and award-winning *(see:Fishing News Award: https://vimeo.com/user100904624)*.

The Net Regeneration Scheme has additional benefits in reducing CO2 by putting recycled plastic back into the economy, which has a significant CO2 saving over using new virgin plastic. It covers the cost of transporting the gear to plastics recyclers and closes the 'recycling loop' by converting the plastic waste back into products such as kayaks, surfing handplanes, tote boxes and recycling bins.

Throughout the years, and thanks to the support of several grants, Odyssey Innovation has been able to invest in the appropriate infrastructure (skips, bins, salaries, marketing, logistics) to scale its operations that were once restricted to a few harbours in Cornwall. The desire for positive change, particularly amongst the fishing industry, has been palpable in most cases. A strategic long term partnership with Exeter City Council's Materials Recovery Facility (MRF) has also broadened Odyssey Innovation's horizons by providing excellent collections services,
state-of-the-art premises with facilities for processing and storing vast amounts of waste and most recently a part-investment in an industrial shredder to produce a marine plastic granulate which is now for sale and has an infinite and exciting amount of applications.

To date one can find 3 large skips placed at Exeter City Council, Trevisker Garden Centre and Newlyn further supplemented by 15 large wheelie bins at Circular & Co -Perranporth, Surfers Against Sewage-St Agnes, Lost Gardens of Heligan, Ilfracombe, Milford Haven, Fishguard, Holyhead, Cardigan, Weymouth x3, Sutton x 2, Newquay, Mevagissey, Looe and Falmouth for community members to use, free of charge.

With funding from the Welsh Government, Odyssey Innovation are rolling out a pilot Net Regeneration Scheme along the Welsh coastline and would like to invite members of the fishing community and harbours interested in participating to get in touch. Implementation dates are set to Tuesday 12th October for bin drop offs in Holyhead, Cardigan and Amlwch whilst Milford Haven and Fishguard will see their facilities dropped off on Wednesday 13th October.

Seafish, the public body that supports the seafood industry in the UK, has offered in-kind support on behalf of Welsh Government and the Welsh fishing industry to help facilitate the project. Having previously worked in the South West with Odyssey Innovation, the organisation is delighted to be supporting this new initiative.

Other recent illustrious news includes the Net Regeneration Scheme being chosen as a major data providing partner in the EU Interreg project 'INdiGO' whilst also winning a

government tender to carry out recycling schemes across Wales. It was selected by BVRIO from 214 recycling ventures around the world to initiate a plastic credits scheme and was consulted by MRAG and the European Commission to assist in developing a framework for extended producer responsibility schemes.

To date, Odyssey Innovation has successfully recovered and/or diverted over 200,000 kilograms of plastic from landfill and incineration and from entering into the marine environment; all of which have been recycled successfully. The scheme also ticks 8 of the UN's Goals for Sustainable Development.

Press Contact:

For more information, images or any other enquiries, please contact support@odysseyinnovation.com or find us on your preferred social media channel.

Personal Statements:

Mr. Rob Thompson, Managing Director at Odyssey Innovation says: "The Net Regeneration Scheme has only been made possible through collaboration, primarily between the fishing sector and conservation groups, further supported by universities and the government. This collaborative project between us, Welsh Government and fishing communities will showcase exemplary best practice in a sector where it is immensely needed; furthermore the quality of our seas and the aquatic flora and fauna within it will also benefit tremendously.''

A Welsh Government spokesman says: ''Welsh Government are pleased to be working with Odyssey Innovation to introduce the pilot scheme in Wales. Disposal options for end of life fishing gear continue to be an issue for the fishing industry in Wales and we hope this scheme will offer a solution. This scheme will be the first of its kind in Wales and will support our commitment for the Sustainable Management of Natural Resources and moving towards Good Environmental Status.''

Dr. **Holly Whiteley, Welsh Regional Manager at Seafish** says: "Seafish has been supporting gear recycling initiatives around the UK, so it's great to see this new initiative being rolled out for Welsh fishermen. Providing facilities to recycle old fishing gear will assist the sector to further improve its sustainability credentials and help it thrive."

Additional Resources:

➔ ***For More About Odyssey Innovation Ltd.***

Odyssey Innovation Ltd is a circular economy company focused on providing a multitude of environmentally friendly marine litter solutions to a vast range of stakeholders within the fishing industry; usually for harbours, individual fishermen, private fisheries and ports these services relate to end-of-life fishing gear and fall under our Net Regeneration Scheme, whilst NGOs within the industry tend to require services revolving around ALDFG and fall underneath our Marine Regeneration Scheme.

Both schemes have been in place for the past 4 years in Cornwall and support the ambitions of 16 harbours and 8 beach clean groups and NGOs to adopt a best practice approach to waste disposal which is fully traceable and award winning (Fishing News Award video link: https://vimeo.com/user100904624).

Through our on-the-ground, academic and technical expertise we have developed simple instructional methods for the participants of both the NRS and MRS which help with the identification of fishing gear in their regional context whilst also providing guidance on how these materials should be prepared should they successfully be recycled. Alternatively, we can also identify fishing gear types via images/recorded footage and when in doubt can site inspect. In the rare case of coming across fishing gear with complex plastic polymer types we will then need to use specialised machinery and laboratories to support our work.

We are the only UK company with experience and the ability to recycle a broad range of materials from the fishing industry, including problematic materials like nets and ropes. We also have experience of recycling other fishing industry related plastic like Whelk pots, drums, floats, fish boxes etc.

Odyssey Innovation are proud to have worked on various projects related to the identification and recycling of fishing gear alongside renowned local and international entities such as GGGI,
DEFRA, MRAG, SEAFISH, European Commission, The University of Plymouth, CEFAS, Environment Agency, MMO, Sussex Wildlife Trust, English Heritage, The INdiGo Project etc.

UN Goals for Sustainable Development we fulfil:

Some of our most recent awards: