



Products from Waste Fishing Nets

Accessories, Clothing, Footwear, Home Ware
And Recreation

**Professor Martin Charter, Director, The Centre for Sustainable Design[®], Business School for The Creative Industries, University for the Creative Arts
Ros Carruthers, EWA Coordinator, The Centre for Sustainable Design[®], Business School for The Creative Industries, University for the Creative Arts**

March 2022

BLUE CIRCULAR ECONOMY

The Blue Circular Economy (BCE) is a three-year initiative to help Small and Medium-Sized enterprises (SMEs) to attain a greater market reach by offering products and services derived from waste and “end of life” fishing gear, as well as, recycling solutions.

The BCE mission is to generate sustainable business opportunities and solutions related to waste and “end of life” fishing gear through informed, innovative and collaborative efforts, for the benefit of enterprises, local economies, and the environment in the NPA region (see Annex 1).

The vision is to create the ecosystem, knowledge and industry necessary to address waste and ‘end of life’ fishing gear by fostering a vibrant industry for the recycling and reuse of used fishing nets, ropes, components and peripherals.

Established in 2018 the Blue Circular Economy is a partnership between Norwegian University of Science and Technology, Western Development Commission, Technical University of Denmark, The Centre for Sustainable Design® at UCA, and the Environmental Research Institute. The three-year programme is funded under the European Regional Development Fund (ERDF) Northern Periphery and Arctic 2014-2020 programme (<http://www.interreg-npa.eu/>).

Full details on www.bluecirculareconomy.eu



**BLUE CIRCULAR
ECONOMY**



**Northern Periphery and
Arctic Programme**
2014–2020



EUROPEAN UNION
Investing in your future
European Regional Development Fund

Disclaimer: All reasonable measures have been taken to ensure the quality, reliability, and accuracy of the information in this report. This report is intended to provide information and general guidance only. Any decisions made based on the information and guidance in this report is the organisation’s responsibility.



**BLUE CIRCULAR
ECONOMY**

CONTENTS

- BLUE CIRCULAR ECONOMY2
- CONTENTS.....3
- INTRODUCTION6
- OVERVIEW OF PRODUCT ENTRIES INCLUDED IN THE 2022 REPORT9
- COMPANIES 11
 - Karün – Chile 11
 - Sunglasses 11
 - Bracenet – Germany 11
 - Bracelets 12
 - Rings 12
 - Bags 13
 - Mask Chains 13
 - Dog Leashes 14
 - Key Chain 15
 - Anklet 15
 - Kettle Cove Enterprises - US 16
 - Bicycle Accessories 16
 - Bird Feeders 17
 - Axiom - Canada 17
 - Bicycle Accessories 17
 - Teko ® - Scotland 18
 - Socks 18
 - Klattermusen – Sweden 18
 - Backpacks 19
 - Ecoalf – Spain 19
 - Jackets 19
 - RubyMoon - UK 20
 - Swimwear 21
 - Adidas – Germany 21
 - Footwear 22
 - Verdura - Italy 22
 - Footwear 23
 - Fishing Net Bags 23
 - Interface – US/UK 23

Carpet Tiles	24
The Maine Coast Rope Rugs - US	24
Mats	24
Baskets	24
A Frayed Knot - UK	25
Bureo – Chile	25
NetPlus® Fabrics	26
Patagonia - Hat Brims, Clothing	26
Trek – Water bottle cage	27
Costa Sunglasses	27
Carver Skateboard	27
Futures Surf fin	28
Frisbee	28
Board Game	28
Waterhaul – UK	29
Sunglasses	29
Net Your Problem – UK	30
Coordinate recycling fishing nets	30
Nofir – Norway	30
Recycling fishing nets	30
Fishy Filaments™ - UK	31
Fishy Sticks	31
Porthurno - 100% Recycled Nylon Filament	31
Porthurno – Recycled Nylon Micro-Pellet	32
Longships – Cornish Nylon Pellet	32
LifestyleGarden® - UK	32
Chair - DuraOcean Collection	33
EXIT – Ireland	33
Hang Up XRail	33
Odyssey Innovation – UK	34
Marine Surfing Handplane	35
Plastix Global – Denmark	35
Recycling fishing nets	35
Econyl® - Italy	36
Recycling fishing nets	36
Valentina Vasilatou – Italy, Greece	37
Swimsuits	38

ANNEX 1: NPA REGION.....39

BACK PAGE.....41

The Centre for Sustainable Design ®, Business School for the Creative Industries, University for
the Creative Arts, UK 41

INTRODUCTION

In the EU, 27% (by count) of marine litter comprises plastic fishing gear, with single use plastics making up a further 43%¹. Fishing gear² containing plastic poses a significant risk to marine ecosystems, biodiversity and human health. There are additional risks to marine-related economic activities including tourism and shipping. Analysis by United Nations Environment Programme (UNEP) has suggested that 70%, by weight, of floating macro plastic debris, in the open oceans, is fishing-related.³ Waste fishing gear is increasingly being recognised as a key part of the ocean waste or marine litter problem and has gained further policy, media⁴ and NGO attention. In October 2020, WWF reported that between 0.5 and one million tonnes of fishing gear that is lost or discarded in the world's oceans each year.⁵

There are essentially two categories of waste fishing gear⁶: “end of life” of fishing gear; and abandoned, lost or discarded gear (ALDFG) which is commonly known as “ghost gear”. “End of life” fishing gear is often left in piles in harbour facilities due to a lack of a waste management plan for fishing gear, which means it often goes to landfill or incinerators. Ghost gear is abandoned, discarded or accidentally lost fishing gear that fish or marine animal predators and scavengers can get caught in and, typically, die as a result.

Companies have only recently started to produce commercial products derived from waste and “end of life” fishing gear. The products either reuse fishing gear in some form or utilise recycled pellets, fibres and filament derived from fishing gear. In 2018, The Centre for Sustainable Design © at UCA Business School documented products derived from waste and “end of life” fishing gear that were commercially available and this was published in a report⁷.

New research into commercial products in the market was completed for a 2nd report between July 2019 and March 2022. Research was based on internet research and information published on company websites. All existing entries from the 2018 report were checked and updated, and new

¹ Single use Plastics includes food containers; beverages cup, containers, caps & lids; packets & wrappers, tobacco product filters, sanitary items & wet wipes; lightweight plastic carrier bags

² The definition of ‘fishing gear’ is aligned to the definition used in the SUP Directive – Fishing Nets, Ropes, Components and Peripherals (FNRCs). Peripherals include polymers, metals, rubbers etc.

³ http://wedocs.unep.org/bitstream/handle/20.500.11822/7720/-Marine_plastic_debris_and_microplastics_Global_lessons_and_research_to_inspire_action_and_guidance_policy_change-2016Marine_Plastic_Debris_and_Microplastics.pdf?sequence=3&isAllowed=y

⁴ <https://www.theguardian.com/commentisfree/2022/jan/19/dumped-fishing-gear-killing-marine-life-governments-care-scottish-trawlerman-nets#comment-154394954>

⁵ <https://www.worldwildlife.org/stories/ghost-fishing-gear>

⁶ Point 1 of Article 3 of Directive 2008/98/EC defines ‘waste fishing gear’ as any fishing gear covered by the definition of waste in, including all separate components, substances or materials that were part of or attached to such fishing gear when it was discarded, including when it was abandoned or lost

⁷ https://cfsd.org.uk/wp-content/uploads/2016/10/Circular-Ocean_Research_Products_FINAL_23-04-18.compressed.pdf

products included. Products were only included if they indicated that they were explicitly or partially sourced from waste or “end of life” fishing gear. It was found that several products promoted as using waste or “end of life” fishing gear appeared to have used polymers derived from general waste marine plastic. In addition, it was difficult to assess the proportion of recycled polymers derived from waste or “end of life” fishing gear compared to the overall volume of recycled polymers used in products. Each entry provides details of products, materials and links for further information.

This summary report builds on the 2018 report. The aim is to provide a snapshot of commercial products that utilise polymers from waste and “end of life” fishing gear. Due to the lack of clarity of information provided on websites, this report should be viewed as indicative and not definitive. It is strongly recommended that more detailed research is undertaken directly with product providers to determine the accuracy of entries. To avoid greenwashing, there is a need for clearer communications and more transparency related to the types and origins of marine plastics waste used in products especially in relation to use of waste and “end of life” fishing gear.

The products identified were primarily to Business to Consumer (B2C) although other research⁸ has indicated that Business to Business (B2B) products are emerging in Norway. The products available are primarily consumer accessories, clothing, footwear, homeware and recreational products with the most popular item being sunglasses. New companies producing products were added to the 2022 report. 24 companies were identified compared to 18 in 2018. Of those 18 companies highlighted in the 2018, 4 were removed due to websites no longer being active or no longer using used fishing gear in their products and 10 new companies were added.

Fibres, filament and pellets from polymers derived from waste and “end of life” fishing gear are increasingly being used in different applications. Aquafil and Fishy Filaments now include examples of different products made from their materials on their respective websites. In addition, Bureo have repositioned itself as materials supplier rather than a supplier of final products which was its focus back in 2018.

It was difficult to assess with certainty the use of materials on many websites. However, some companies have taken the lead on the transparency of the materials used in their products. For example, Bracenet in Germany includes detailed information on the materials used in each of their products.

⁸ <https://cfsd.org.uk/wp-content/uploads/2022/03/BCE-Local-Innovation-Systems-FINAL-March-2022.pdf>

Larger companies are now entering the discussion and have indicated the use of recycled polymers derived from waste and “end of life” fishing gear into more mainstream produced. For example, Samsung published the following press release on the 9th February 2022 ⁹; however, as at 30th March 2022, no further details of products using discarded fishing nets are available.

“In a move that combines sustainability and innovation, Samsung Electronics developed a new material that gives ocean-bound plastics new life as they’re incorporated into various Galaxy devices. Made with repurposed ocean-bound discarded fishing nets, the use of this material marks another step in our Galaxy for the Planet journey that aims to minimize our environmental footprint and help foster more sustainable lifestyles for the Galaxy community.

Now and into the future, Samsung will incorporate repurposed ocean-bound plastics throughout our entire product line-up, starting with our new Galaxy devices that will be revealed on February 9th at Unpacked. These devices will reflect our ongoing effort to eliminate single-use plastics and expand the use of other eco-conscious materials, such as recycled post-consumer material (PCM) and recycled paper. With this transformation, the future of Galaxy technology will bring leading product design and deliver better environmental impact By giving new life to discarded fishing nets that would otherwise become dangerous waste, Samsung – through its creative solution – exemplifies how we can all do more with less to conserve our planet’s resources”.

⁹ <https://news.samsung.com/au/samsung-repurposes-discarded-fishing-nets-for-new-galaxy-devices>

OVERVIEW OF PRODUCT ENTRIES INCLUDED IN THE 2022 REPORT

The table was updated and corrected as per 30th March 2022. Compared 2018 report, one product was removed from the company websites e.g. swimwear from the Ecoalf. A range of new products were launched by existing suppliers that had been identified in 2018. In addition, several companies closed their websites and were removed from the table or have removed fishing net related products: Planet Love Life (closed website), Auria (changed fibre used), Milliken (needs more clarification on what fibre is used) , Fishpond (changed fibre used).

Company	Website	Country	Products - Red indicates new products
Karün	https://karuneyewear.com/	Chile	Sunglasses
Bracenet	https://bracenet.net	Germany	Bracelets, Rings, Bags, Mask Chains, Camera Accessories, Dog Leashes, Key chains, Anklets
Kettle Enterprises	http://kettlecoveenterprises.com	US	Bicycle Accessories, Bird feeders
Axiom	http://www.axiomgear.com/	Canada	Bicycle Accessories
Teko	https://www.tekoforlife.co.uk/	UK	Socks
Klattermusen	https://www.klattermusen.com/	Sweden	Backpacks
Ecoalf	https://ecoalf.com/	Spain	Jackets
Rubymoon	https://rubymoon.org.uk/	UK	Swimwear
Adidas	www.adidas.com/us/parley	Germany	Footwear
Verdura	https://www.verdurashoes.com	Italy	Footwear, Fishing Net Bags
Interface	http://www.interface.com/US/en-US/about/modular-carpet-tile/Net-Effect	US/UK	Carpet Tiles
The Maine Coast Rope Rugs	https://mainecoastroperugs.com/	US	Mats, Baskets
A Frayed Knot	https://www.etsy.com/shop/Afrayedknotmats	UK	Mats
Bureo	https://bureo.co/collections/bureo/products	Chile	Pellets (multiple applications)
Waterhaul	https://waterhaul.co	UK	Sunglasses
Net your problem	https://www.netyourproblem.com/	UK	Recycling Fishing Nets
Nofir	https://nofir.no/en/	Norway	Recycling Fishing Nets
Fishy Filaments	https://fishyfilaments.com/	UK	Filaments

Company	Website	Country	Products - Red indicates new products
LifestyleGarden	https://lifestylegarden.co.uk/	UK	Chair
Exit	https://exitwatersports.com	Ireland	Wetsuit Hanger
Odyssey Innovation	https://www.odysseyinnovation.com	US	Surging Handplane
Plastix	https://plastixglobal.com/	Denmark	Pellets (multiple applications)
Econyl	https://www.econyl.com/	Italy	Fibres (multiple applications)
Valentia Vasilatou	https://valentinavasilatou.com/	Italy, Greece	Swimwear



COMPANIES

Karün – Chile

Karün was founded in 2012 and is headquartered in Patagonia, Chile. The company's philosophy is based on respect for the environment, local cultures and a commitment to innovation and sustainable development.

Website: <https://karuneyewear.com/>

Email: europa@karunworld.com

Sunglasses

The sunglasses are designed in and materials sourced from Patagonia. Frames are made with recycled metals and ECONYL® regenerated nylon (fishing nets and other discarded nylon from Patagonia).

Orca Blue



Puma Black



Bracenet – Germany

Bracenet makes unique bracelets, rings and bags from waste fishing nets. Nofir¹⁰ cleans the fishing nets before Bracenet handcrafts them into bracelets, dog leashes and other products. Bracenet indicates that it has recycled over 5 tonnes of fishing nets and “ghost nets” into new products.

¹⁰ <https://nofir.no/en/>

Website: <https://bracenet.net>

Email: hello@bracenet.net

Bracelets

Bracenet cooperates with marine conservation organizations like Healthy Seas and Ghost Fishing, in relation to the collection of fishing nets that have been lost or intentionally sunk at sea. After being retrieved, the nets are cleaned and treated by Nofir using a specialist process. The colour of the nets are only generally revealed when the cleaning process has been completed. The nets are then hand processed by Bracenet in Hamburg. Each finished Bracenet is a unique piece because of the varying net structures, colours, and sizes.

Material

- Fishing nets (HDPE)
- Clasp: gold/rosé stainless-steel bayonet clasp



Rings

Bracenet rings are made of the leftover fishing net snippets from Bracenet production.

Material

- Fishing nets (HPDE polymer)
- End caps made of silver
- Zinc-coated wire inside the ring

Production

- Rings made from net snippets from the Bracenet production, made of a piece of fishing net and metal end caps. Knot and colour originate from the real net.



Bags

The upcycled bag is made of high-quality, woven hemp fabric and recovered “ghost nets”.

Material:

- Inner bag is made of woven hemp fabric in a herringbone pattern, undyed and unbleached and organically cultivated
- Outer net is made of recovered “ghost net” (HDPE)
- Handles are made from ropes recovered from “ghost nets” or discarded fishing equipment (HDPE)
- Sewn using strong cotton thread

Production

- Inner bag is made by Lebenshilfewerk Neumünster (workshop for people with disabilities)
- Fishing net are recovered by Healthy Seas and Ghost Diving and cleaned by Nofir
- Handmade in Germany



Mask Chains

Bracenet also produce a mask chain.

Material

- Fishing net (HDPE)
- Silver stainless steel clasps

Production

- Fishing net details are included with a tag giving the net number and month and year recovered.
- The products are handmade in Germany.
- Knots and colour originate from the real net.



Camera Accessories

The camera strap is an upcycled made from recovered “ghost nets” or retired fishing gear.

Material

- Yellow rope with red or green accents (HDPE)
- Blue wrapping from the inner material of fishing nets (HDPE)
- Silver components from stainless steel and nickel-plated brass

Production

- Ropes from recovered “ghost nets” or retired fishing gear, cleaned by Nofir.
- Handmade in Germany



Dog Leashes

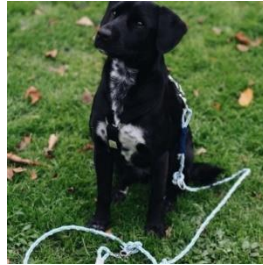
Each dog leash is unique and can vary slightly in terms of appearance and size. The upcycled product is handcrafted from fishing ropes.

Material

- Leash is made from blue-white with red accents HDPE / red-white with green accents HDPE / bluegreen-white with red accents HDPE
- Clip and rings swirl carabiner in brass optic made from steel
- Nylon cord attach to the carabiner

Production

- Ropes are recovered “ghost nets” or retired fishing gear.
- All ropes are separated by hand from fishing nets and cleaned by Nofir before production.
- Handmade in Germany



Key Chain

Key chains are made from recovered “ghost nets” ecosystems.

Material

- Made of a former fishing net (HDPE)
- Matt black stainless-steel cap

Production

- Fishing net are cleaned and handmade in Germany.
- Upcycled product made of a piece of fishing net and magnetic clasp.
- Knots and colour originate from the real net.



Anklet

Anklets are made from recovered “ghost nets” ecosystems.

Material

- Made of a former fishing net (HDPE)
- Silver stainless steel components

Production

- Fishing nets are cleaned in an environmentally friendly way.
- Handmade in Germany.



Kettle Cove Enterprises - US

Kettle Cove Enterprises is a craft manufacturer of bicycle baskets using lobster trap components and bird feeders.

Website: <http://kettlecoveenterprises.com>

Email: info@kettlecoveenterprises.com

Bicycle Accessories

The Removable Front Trap Basket is made to haul cargo on a bicycle and is both lightweight and rugged.



Bird Feeders

Lobster trap components are used to create the Kettle Cove Bird Feeder. The feeders are simple to fill, and can be attached to a variety of surfaces. The lobster trap wire is PVC-coated galvanized steel and is available in two colours - green and yellow. The feeder bowl uses galvanized steel.



Axiom - Canada

Axiom Cycling Gear is a Canadian company that designs cycling accessories using regenerated polyester yarn made from discarded fishing nets.

Axiom are committed to sustainability and source environmentally sound materials, including recycled fishing nets, to create their products. Axiom claims that these bags are the world's only cycling bags to be made from recycled fishing nets. Every bag in the Seymour series uses a new fabric called Oceanweave.

Axiom Cycling Gear is a member of The Global Ghost Gear Initiative.

Website: <http://www.axiomgear.com/>

Email: <https://www.axiomgear.com/support/contact-us/>

Bicycle Accessories



Teko ® - Scotland

Teko ® was established by Gordon Fraser – a sock and footwear designer - who has been working in the field of biomechanics and physiology of the foot and ankle for over 25 years. Teko socks are made using 100% regenerated polyamide (nylon) from fishing nets and other waste material that is regenerated in Aquafil's Econyl ® Regeneration Plant in Slovenia.

Website: <https://www.tekoforlife.co.uk/>

Email: info@tekoforlife.co.uk

Socks

The Teko ® Graduated Compression socks and Teko ® Off Road Running socks are designed for running, cycling and CrossFit to enhance calf muscle stability and blood circulation. The socks are made from 98% regenerated polyamide, 2% elastomer.

Material:

- 98% Econyl ® regenerated polyamide from fishing nets
- 2% Elastomer.



Klattermusen – Sweden

Klattermusen claims to have been the first outdoor company to use recycled polyamide in the Höner backpack.

Website: <https://www.klattermusen.com/>

Email: marketing@klattermusen.se

Backpacks

The Höner 32L backpack is made for Alpine and all-round mountaineering. It is made from 100% Econyl®

Material:

- Retina® 190 g/m²
- 100% Recycled Polyamide
- Surface coated (face), TPU laminated (back)
- Fluorocarbon free



Ecoalf – Spain

Ecoalf produce jackets made with recycled nylon derived from waste fishing gear. In addition to nylon from fishing nets, nylon from the leftovers from production processes are also used. For those garments that are made from fishing nets, Ecoalf have a collaboration with Econyl®.

Website: <https://ecoalf.com/>

Email: No email provided

Jackets

Short and fitted down coat. Made with 100% recycled nylon from fishing nets.

Material:

- Main fabric: 100% Econyl® Regenerated Nylon
- PFC-free



RubyMoon - UK

RubyMoon is a Community Interest Company Ltd. The sustainable brand offers swim and active wear for women that is ethically manufactured and made from sustainable materials. RubyMoon also helps women set up and grow businesses across the globe. RubyMoon uses Econyl® nylon yarn from used fishing nets and other waste material in its swimwear fabrics. To date RubyMoon claimed to have helped over 1200 women and their families to find a route out of poverty.

Website: <https://rubymoon.org.uk/>

Email: hello@rubymoon.org.uk



Swimwear

Material

- Made with Econyl®



Adidas – Germany

Adidas developed a partnership with Parley For The Oceans¹¹ started in 2015 with the aim of creating a concept trainer that was made almost entirely out of ocean plastic waste and discarded fishing nets. It is unclear whether this has been achieved. The green wave pattern across the uppers is created from recycled gill net. <https://www.adidas-group.com/>



¹¹ <https://www.parley.tv/#fortheoceans>

Website: www.adidas.com/us/parley

Email: Laura.Baum@adidas.com

Footwear

Material

- Uppers made from recycled gill net



Verdura - Italy

Verdura produce footwear for women, men and kids, and fishing net bags. One of the materials used in the footwear is recycled fishing nets. Verdura's story is as follows. Verdura's founder spotted pieces of fishing net on the beach near his hometown of Piombino on the Italian coast. He picked one up, out of curiosity, put his foot into it, to see how strong it was and immediately recognised the shape of a sandal forming around his foot. He felt that he could make a sandal from this net, but realised he would need to soften it, to make it comfortable.

Verdura use narrow-gauge nylon fishing nets, that were banned by the European Union because the capacity to capture young fish and endanger many species. Verdura have found it difficult to find fishing nets in sufficient quantities and have sourced from multiple locations e.g. docks, directly by fishermen and from the sea. Fishers have become Verdura's suppliers. Fishing gear is sourced, then the mesh cut and washed several times to soften the fabric. The fishing gear is then dyed with natural pigments and combined with cork, recycled rubber sole and leather scraps left behind by the production of other shoes. The insole is made of natural cork and sole is available in two versions, one made from recycled rubber and the other from vegetable-tanned recycled leather.

Website: <https://www.verdurashoes.com>

Email: info@verdurashoes.com

Footwear



Fishing Net Bags



Interface – US/UK

Net Effect is one of a portfolio of carpet tile collections from global carpet company Interface, that is made with nylon yarn sourced from the Net-Works ¹² programme.

Website: <http://www.interface.com/US/en-US/about/modular-carpet-tile/Net-Effect>

Email: info@interface.com

¹² <https://net-works.com/>

Carpet Tiles



The Maine Coast Rope Rugs - US

Maine Coast Rope Rugs use recycled lobster float rope to make our doormats, rugs, runners and home decor.

Website: <https://mainecoastroperugs.com/>

Email: hello@mainecoastroperugs.com

Mats



Baskets



A Frayed Knot - UK

Afrayedknot uses fishing rope mainly washed up on the shores of Orkney Scotland or donated by local fishermen and turns this into mats. The fishing net ropes are initially washed in a washing machine and then used to make mats. Afrayedknot also provide rope wreath making workshops, where individuals can learn to make mats, doorsteps and other items from of old fishing ropes. Afrayedknot's products are sold through a web shop powered by ETSY¹³

Mats



Bureo – Chile

Bureo is based in the US and Chile, is focused on scaling an innovative and transparent model to eliminate fishing net pollution. Bureo's Net Positiva programme works together with fishermen to provide solutions to "end of life" fishing gear, through the transformation of the polymers from the fishing gear into highly recyclable and durable raw materials - NetPlus® materials. Bureo claim that over 600,000 KG of NetPlus® materials have been collected to date from 50 participating fisheries in South America. Bureo is a certified B-Corporation, a member of 1% for the Planet, and has been a participating company in Patagonia's Tin Shed Ventures Fund since 2013.

Bureo were involved in producing multiple products from waste fishing gear. However, recently the company re-positioned itself to become material suppliers. Below are some of the applications of Bureo NetPlus® materials.

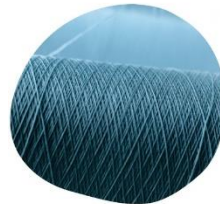
Website: <https://bureo.co/collections/bureo/products>

¹³ <https://www.etsy.com/shop/Afrayedknotmats>

Email: ben@bureo.co

NetPlus® Fabrics

- Discarded fishing nets are collected from coastal communities in South America
- Nets are deconstructed and re-formed into 100% recycled NetPlus® pellets
- Pellets are extruded and spun into NetPlus® yarn
- Yarn is woven into fabrics and used in a range of garments



Patagonia - Hat Brims, Clothing

Bureo is collaborating with Patagonia to integrate their NetPlus® material into Patagonia's hat brims and textiles. Bureo claimed have kept more than 149 metric tons of waste plastic out of the world's oceans by turning fishing nets into hat brims and fabric¹⁴. Bureo's material developers worked closely with supply-chain partners to chemically transform the plastic in the fishing nets into a high-quality yarn that could be used in garments¹⁵. It is forecasted that by the 2021 season, 104 metric tons of fishing nets will be woven into Patagonia clothing. By developing NetPlus® materials with Bureo, Patagonia have supported the collection and recycling of more than 400 metric tons of discarded fishing nets.



¹⁴ <https://bureo.co/pages/patagonia-hats>

¹⁵ <https://bureo.co/pages/patagonia-jackets>

Trek – Water bottle cage

Trek’s water bottle cage, The Bat Cage, is now made from Bureo’s NetPlus ® material. Bat Cage will put 44,000 square feet (3,850 pounds) of discarded fishing nets to good use.¹⁶



Costa Sunglasses

Bureo partnered with Costa Sunglasses to incorporate NetPlus ® material into a new line of sunglasses. The Untangled Collection frames are constructed from 100% recycled fishing nets and are fit with mineral glass lenses, avoiding the use of any new plastic materials.¹⁷



Carver Skateboard

The Ahi is a cruiser skateboard made NetPlus® material. Each skateboard prevents more than 30 square feet of fishing nets from entering the oceans while also providing income to Chilean fishing communities.¹⁸



¹⁶ <https://bureo.co/pages/trek-batcage>

¹⁷ <https://bureo.co/collections/sunglasses-1>

¹⁸ <https://bureo.co/collections/bureo/skateboards>

Futures Surf fin

Combining Bureo's certified NetPlus® material with Futures' Compound 6 carbon fibre and air infusion technology, the new Bureo x Futures Alpha Series fins are lightweight and resilient. The Futures template reduces drag and improves performance over standard fiberglass or plastic injection fins through the use of advanced foil technology. ¹⁹



Frisbee

The Fishnet Flyer is made in California using NetPlus® from recycled fishing nets. ²⁰



Board Game

The board game is a collaboration between Jenga® Ocean™ and Bureo. This is potentially the first board game made from 100% recycled fishing nets. Jenga® Ocean™ is made from NetPlus®

¹⁹ <https://bureo.co/collections/bureo/products/bureo-x-futures-fin4fin-surf-fin>

²⁰ <https://bureo.co/collections/bureo/products/bureo-fishnet-flyer-frisbee>

sourced from over 25 square feet of fishing nets collected via Bureo's Net Positiva recycling programme.

Players of Jenga® Ocean™ are encouraged to 'Save the Animals' through special edition rules. Learning about the damaging impact of discarded fishing nets, players gain an understanding of how discarded nets are harming marine animals and learn about what they can do to help.²¹



Waterhaul – UK

Waterhaul was founded by marine conservationists who identified that every winter beaches were inundated with “ghost gear”, lines and offcuts. The company partnered with mechanical recyclers to process various forms of “end of life” fishing gear and produced its first pair of sunglasses in 2018.

Website: <https://waterhaul.co>

Email: marketing@waterhaul.co

Sunglasses

The sunglasses are made from 100% recycled polypropylene trawl nets and lines, and are Italian engineered and hand-finished. The frames are covered by a ‘Recycle and Replace’²² lifetime guarantee e.g. damaged frames can go back into the plastic recycling loop to create new pairs.

²¹ <https://bureo.co/collections/bureo/products/jenga-ocean>

²² <https://waterhaul.co/collections/sunglasses>



Net Your Problem – UK

Coordinate recycling fishing nets

Net Your Problem LLC mission is to engage with a variety of stakeholders and partners to create an economically viable pathway to recycle “end of life” fishing gear. Net Your Problem LLC coordinate a network of recyclers of fishing gear. In order to initiate a project in a new area, or in a new fishery, Net Your Problem LLC need to receive pictures of the fishing gear (to get an idea of the type, its condition and the amount). Physical samples then need to be sent to the companies Seattle office where the fishing gear is tested to determine what type of plastic it is made from. After this analysis, to determine Net Your Problem LLC determine which recycler is best suited to recycle the polymer.

Website: <https://www.netyourproblem.com/>

Email: nicole@netyourproblem.com

Nofir – Norway

Recycling fishing nets

Nofir is a reverse logistics company that collects discarded fishing gear for recycling. Nofir works closely with Aquafil who produce Econyl®. Nofir was established in Norway to develop a nationwide system for the collection and processing of discarded equipment from fisheries. Nofir received support from the European Union’s Eco-innovation initiative and has now expanded its activities throughout Europe.

Website: <https://nofir.no/en/>

Email: kristian@nofir.no

Fishy Filaments™ - UK

Fishy Filaments' (FF) produces 3D printing filament produced from recycled nylon from fishing gear. FF are able to track its reclaimed polymers back from commercial fisheries through the global fishing net supply chain due to the nylon used by being made to very high standards. In addition, FF carry out scientific analysis to provide evidence as to the provenance e.g. independent 3rd party labs are commissioned to ensure that the material collected has not become contaminated or chemically altered through its life. The nets sent to FF they have typically been used by Cornish fishers for 3-6 months - and very rarely any longer - as their surfaces become cloudy and they stop catching fish. The nylon may be slightly contaminated with salt and biotic material, but the underlying structural integrity of the polymer remains and filaments can be produced for use in 3D printing.

Website: <https://fishyfilaments.com/>

Email: sales@fishyfilaments.com

Fishy Sticks

Fish Sticks are 25cm long rods of 100% Recycled Marine Nylon™ that are extruded as new filament, but they are not dimensionally accurate enough to be sold as 3D printing filament.



Porthcurno - 100% Recycled Nylon Filament

Porthcurno is a premium blend of 100% recycled Cornish Nylon, recovered from a single type of high strength nylon net. The source of the nets is a Marine Stewardship Certified (MSC) Cornish Hake fishery, consisting of 14 known boats all sailing from Newlyn.



Porthcurno – Recycled Nylon Micro-Pellet

Porthcurno filament is made from 100% recycled Cornish Nylon and FF are making it available for others to compound, extrude or use in non-3DP applications. Use in injection moulding has been proven, as has compounding with standard nylon-compatible masterbatch



Longships – Cornish Nylon Pellet

Longships is a Nylon 6 blend for applications where impact resistance and stiffness are needed. Although the blend has been designed to work with pellet-feed 3D printing, 100% recycled pellets can be provided for multiple applications.



LifestyleGarden® - UK

DuraOcen® is the brand name for a pellet that is made from recycled maritime and fishing ropes.

Website: <https://lifestylegarden.co.uk/>

Email: No email provided

Chair - DuraOcean Collection

LifestyleGarden® uses DuraOcean® to produce an innovative chair that incorporates recycled plastic from recycled maritime and fishing ropes.



EXIT – Ireland

Exit aims to produce products using polymers from waste fishing gear.

Website: <https://exitwatersports.com>

Email: info@exitwatersports.com

Hang Up XRail

HUX is a wet swimsuit hanger made from repurposed fishing net which has either been reclaimed from the ocean or at “end of life”.



Odyssey Innovation – UK

Odyssey Innovation established its Net Regeneration Scheme (NRS) – fishing gear recycling scheme - in 2016. The scheme is now recognised in many harbours ranging from Dover (UK) to Flint (Wales) and is now expanding into Scotland. As detailed below, Odyssey Innovation claim to have been reintroduced back 200 tonnes of marine plastic into “circular products” via the NRS.



Marine Plastic Recycling Guidelines

www.odysseyinnovation.com

WE ACCEPT	
	plastic buoys
	plastic crates
	polypropylene polyethylene - rigid plastic
	plastic drums
	loose rope (bagged separately and free from contamination)
	plastic bottles and caps
	floating pontoons
	gill nets (bagged separately from ropes)
	plastic food containers
	whelk pots (nets and weights removed)
	net trimmings / fisherman's kisses (if bagged separately)
	plastic toys
	net bins
	trawl nets (if stripped of metal and rubber and bagged separately or in a bundle)
NOT ACCEPTED	
	polystyrene
	glass
	rubber
	heavily contaminated materials
	fiberglass
	general rubbish
	traps/pots
	metal
	sanitary products, cotton buds
	containers with any contents or contamination inside/outside
	lead-lined ropes

About the Marine Regeneration Scheme

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. 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

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.

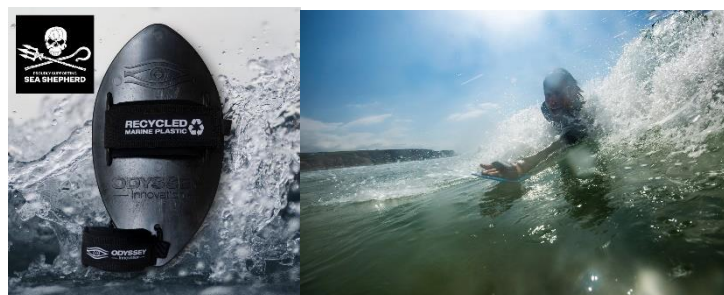
Follow Us @OdysseyInnovation @NetRegeneration @PaddleforPlastic

Website: <https://www.odysseyinnovation.com>

Email: No email provided

Marine Surfing Handplane

Odyssey Innovation have produced a handplane that is made from recycled fishing nets and ropes that is sourced from fishermen, harbours, divers and beach clean charities that subscribe to the NRS.



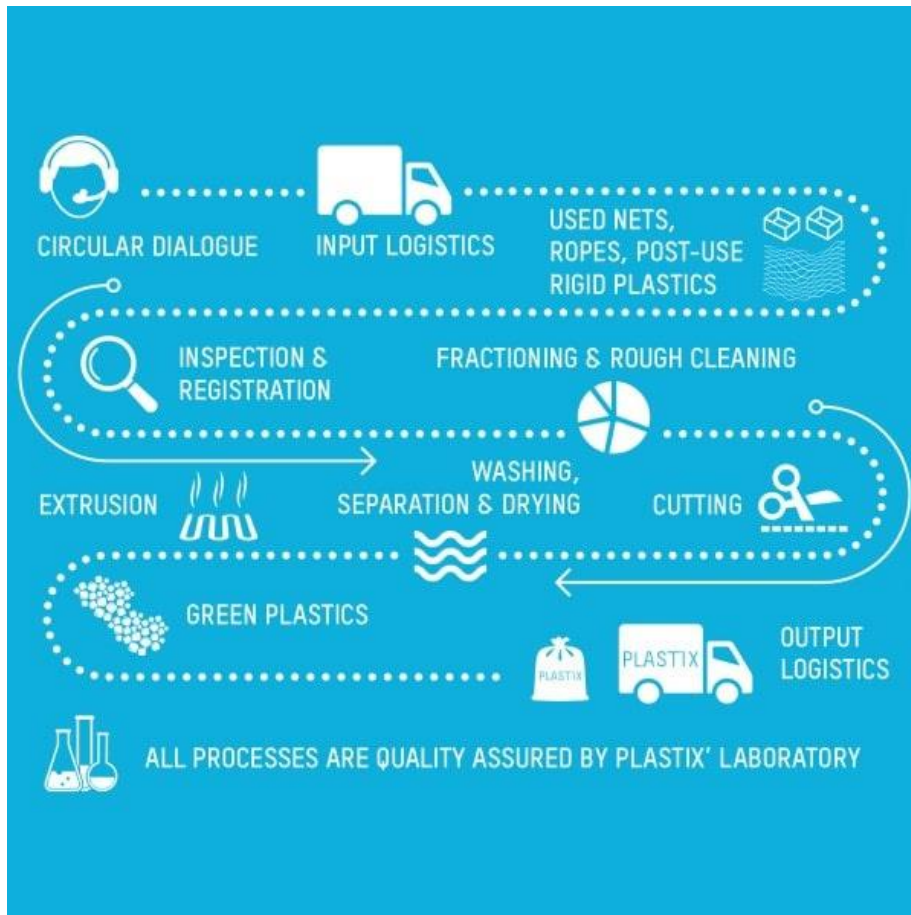
Plastix Global – Denmark

Recycling fishing nets

Plastix Global (PG) provide mechanical recycling solutions for fishing nets and ropes, and produce high-quality raw plastic materials e.g. pellets. The process starts with sourcing primarily fibre polymers from fishing nets, trawls and ropes that are globally sourced via ports, fishing net producers, and plastics collectors. Once these used polymers arrive at the PG factory, they are sorted into the different types of polymers and colours. This process can be a quite labour-intensive, as the recyclability of fishing gear and other plastic fibre products is not normally considered by manufacturers nor users. After being sorting and fractioned, the polymers are shredded, washed, separated, and dried. Finally, the materials are compounded and extruded into recycled pellets. PG's on-site laboratory analyses, registers and assesses the recyclability of all input waste streams. Currently 800 different types of nets, ropes and trawls are registered in PG's database.

Website: <https://plastixglobal.com/>

Email: info@plastixglobal.com



Econyl® - Italy

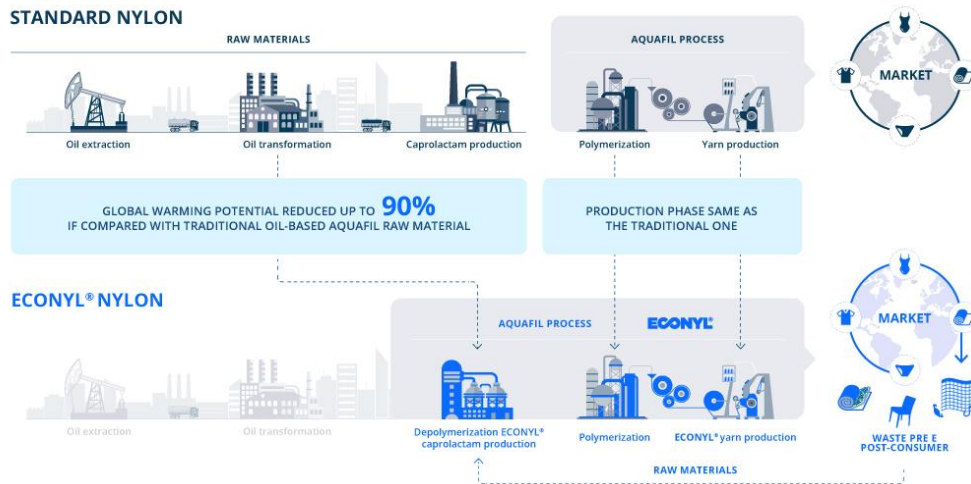
Recycling fishing nets

Aquafil produce Econyl® regenerated nylon using a chemical recycling process that de- and then re-polymerises nylon from fishing nets. The Econyl® regeneration process transforms waste and “end of life” fishing nets into materials that are now being used in the fashion, furniture and other industries. See other entries in the report for specific applications.

Website: <https://www.econyl.com/>

Email: info@econyl.com

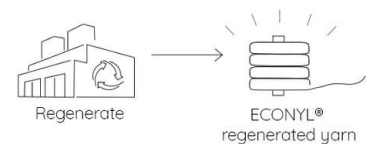
The “life cycle thinking” approach



Aquafil have established a Digital Hub where existing and new customers can review different applications for Econyl®. ²³

Valentina Vasilatou – Italy, Greece

Valentia Vasilatou swimsuits are produced from recycled and regenerated fabrics using Econyl®. The company works in collaboration with Healthy Seas to collect “ghost fishing” nets through underwater clean-ups. The collected nylon fishing nets are first cleaned, then transported to a Aquafil’s factory where they are regenerated into Econyl® yarn. The yarn is then knitted to produce the fabrics used to make the swimsuits, which are certified by Aquafil and OEKO TEX.



²³ <https://www.econyl.com/shop/>

Website: <https://valentinavasilatou.com/>

Email: No email provided

Swimsuits

- Fabric composition: outer fabric: Econyl® (78% recycled PA (nylon), 22% EA (elastomer))
- Lining fabric: Recycled Polyamide (84% recycled PA, 16% EA). Not all Valentia Vasilatou swimsuits are made from Econyl®



ANNEX 1: NPA REGION

The NPA Programme 2014-2020 covers a vast area, as shown on the map below. The programme partner countries are the EU Member States of Finland, Ireland, Northern Ireland, United Kingdom and Sweden and Non-EU Member States Faroe Islands, Greenland, Iceland and Norway.

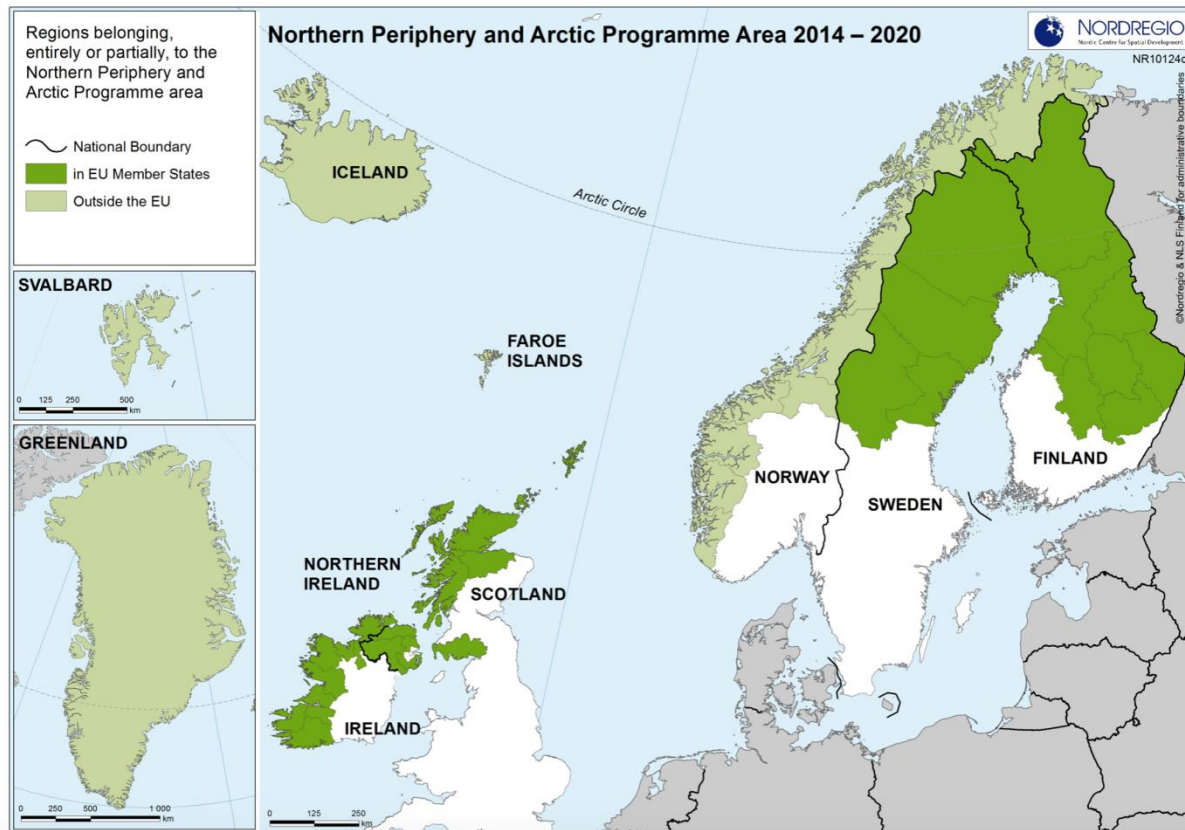


Figure 1: NPA region (sourced from <http://www.nordregio.org/maps/interreg-v-b-northern-periphery-and-arctic-region-programme/>)

Eligible regions within the NPA are (also see above map)

The NPA region covers a large programme area and despite the geographical differences shares several common features, such as low population density, low accessibility, low economic diversity, abundant natural resources, and high impact of climate change. This unique combination of features results in joint challenges and joint opportunities that can best be overcome and realised by transnational cooperation.

EU Member States

Finland

- FI19 Länsi-Suomi (Keski-Suomi)
- FI1D Pohjois- ja Itä-Suomi

Ireland

- IE01 Border, Midland and Western (County Donegal, County Galway, County Leitrim, County Mayo, County Sligo)
- IE02 Southern and Eastern (County Clare, County Cork, County Kerry, County Limerick)

Northern Ireland

- UKN0 Northern Ireland (excluding Belfast and Outer Belfast)

Scotland

- UKM32 South Western Scotland (Dumfries and Galloway)
- UKM6 Highlands and Islands

Sweden

- SE32 Mellersta Norrland
- SE33 Övre Norrland

Non-EU Member States

Faroe Islands

- FO Faeroerne

Greenland

- GL Greenland

Iceland

- IS Island

Norway

- NO43 Rogaland
- NO05 Vestlandet
- NO06 Trøndelag
- NO07 Nord-Norge
- SJ Svalbard and Jan Mayen

BACK PAGE

The Centre for Sustainable Design ®, Business School for the Creative Industries, University for the Creative Arts, UK

The Centre for Sustainable Design ® (CfSD) was established in 1995 in Farnham, Surrey, UK at what is now the University for the Creative Arts (UCA). CfSD is based within the Business School for the Creative Industries (BSCI). The Centre has led and participated in a range of high quality research projects and has organised hundreds of conferences, workshops and training courses in Europe, Asia and North America focused on sustainable innovation and product sustainability. CfSD is recognised worldwide for its knowledge and expertise, having worked closely with business, policy making and research communities for two decades. CfSD has built world-class knowledge and expertise of sustainable innovation and product sustainability. The Centre completes research and disseminates understanding of present and future sustainability impacts and solutions related to innovation, products, technologies, services and systems through projects, training, events, networks and information. CfSD works with partners in Europe, Asia and North America to deliver high quality results. CfSD have led and partnered in 15+ European Commission funded projects (www.cfsd.org.uk/projects) and has actively worked with 500+ eco-innovative SMEs. The Centre is an internationally recognised centre of excellence. CfSD has two areas of core competence based on extensive research since the mid-1990s (www.cfsd.org.uk/research). CfSD integrates Circular Economy into its broader sustainable innovation and product sustainability activities <http://cfsd.org.uk/news/circular-economy-innovation/>

- Sustainable Innovation (Understanding the policy and business implications of sustainable innovation; and working with companies to develop sustainable solutions)
- Product Sustainability (Understanding the organisational, management, development and design implications of product sustainability)

Contact: Martin Charter

mcharter@uca.ac.uk

www.cfsd.org.uk

Professor Martin Charter, Director, The Centre for Sustainable Design®, Business School for the Creative Industries, University for the Creative Arts

March 2022

For more information email: mcharter@uca.ac.uk



@BlueCircular



bluecirculareconomy.eu



[bluecirculareconomy](https://www.facebook.com/bluecirculareconomy)



[bluecirculareconomy](https://www.instagram.com/bluecirculareconomy)



[bluecircular](https://www.linkedin.com/company/bluecircular)



BLUE CIRCULAR
ECONOMY



Northern Periphery and
Arctic Programme
2014–2020



EUROPEAN UNION
Investing in your future
European Regional Development Fund