CleanAtlantic

Tackling Marine Litter in the Atlantic Area

DELIVERABLE 7.3–Reducing abandoned lost and otherwise discarded fishing gear

WP 7: Tackling Marine Litter

Interreg Atlantic Area
European Regional Development Fund
EUROPEAN UNION
Clean Atlantic

WP	7: TACKLING MARINE LITTER
ACTION	3: REDUCING ABANDONED LOST AND OTHERWISE DISCARDED FISHING GEAR
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DISCLAIMER

CONTENTS

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1. Background

Marine litter is one of the key anthropogenic impacts on ocean life and affects marine life from the organism to the ecosystem level. A type of this litter which is particularly damaging is known as abandoned, lost or otherwise discarded fishing gear (ALDFG). This ALDFG consists of any fishing gear that remains at sea, either deliberately, or beyond control of the owner/operator (Macfadyen et al. 2009).

The capacity of ALDFG to damage marine life depends on the gear type. The Global Ghost Gear Initiative broke this down into two factors, both ranked from one to five, in their report on developing a best practice framework for managing fishing gear (Huntington 2016). The report showed the likelihood of gear being abandoned, lost or discarded and impact of that gear on the environment when abandoned, lost or discarded; this includes entanglement by marine life and habitat damage. Huntington (2016) estimated these factors for the main groups of gear (Figure 1).

GEAR CLASS	LIKELIHOOD	IMPACT	TOTAL RISK
Gillnets	5	5	25
Traps and pots	4	4	16
Fish Aggregating Devices	4	3	12
Hooks and lines	3	3	9
Bottom trawls	2	3	6
Mid-water trawls	1	2	2
Seine nets	1	2	2

Figure 1:Likelihood and impact ratings of classes of ALDFG, taken from Huntington (2016).

According to the UK Sea Fisheries Statistics 2018, all gear classes except for Fish Aggregating Devices are used by UK fishing vessels and are therefore at risk of being lost in UK waters (Elliott and Holden, 2018).

Once fishing gear is abandoned, lost or discarded to the environment, it becomes difficult to remove because it is hard to track down and may have become entangled around ecologically important substrate features or historically important wrecks. When gear has been in the environment for an extended period of time, it may also have become a valuable substrate for local marine life. Because of these factors, SCUBA divers surveying the site and subsequently removing the gear with minimum disturbance are most likely a more sustainable method of ALDFG removal than, for example, towing creeper gear behind vessels (Graham et al. 2009).

The use of SCUBA for ALDFG retrieval is of course limited to shallow depths. Creeper gear has been used successfully in deeper British waters down to more than 1000m (Large et al. 2009). However, little other information is available on ALDFG presence and retrieval in UK waters. Maes et al. (2018) provided an extensive analysis of seafloor litter in the North Sea and Celtic Sea and found mean plastic fishing items km^{-2} to range between 7.9 and 15.4 across both regions. The Marine Conservation Society reports for their 2019 beach surveys, covering 437 UK beaches, that small fishing net fragments and fishing line are both included in the top 10 items, with a mean abundance of 21.3 and 18.8 items per 100m shoreline respectively. Overall fishing-related litter comprised 14.7% of mean number of items per 100m shoreline (MSC 2019).

1.1. Objective

The CleanAtlantic project aims to protect biodiversity and ecosystem services in the Atlantic Area by improving capabilities to monitor, prevent and remove marine litter. Work package 7 is aimed directly at tackling marine litter and action 7.3 addresses ALDFG reduction. Framed in 7.3 and as a result of a collaboration established by CEFAS with Fathoms Free a case study of the removal of ALDFG in the UK by this organization is reported. Here we describe operational protocols, equipment and data management which they have in place, as well as costs and results of their activities.

2. Fathoms Free

2.1. Overview

Fathoms Free consists of a group of volunteers (Figure 2) who have worked since 2014 towards the reduction of ALDFG in British waters through several methods. As part of Project AWARE's citizen science programme Dive Against Debris, Fathoms Free performs removal dives in southwest England. These are done in collaboration with the National Trust, Sea Shepherd, and several other charities. These dive operations will be the focus of this study further on, describing methods used, results obtained and costs of the activities.

Figure 2:A group of volunteers from Fathoms Free with collected fishing gear. Image provided by Fathoms Free.

Additionally, Rob Thompson (Odyssey Innovation Ltd.), the founder and chair of Fathoms Free, has started the Paddle for Plastics campaign. The campaign is run by Odyssey Innovation, with the specific aim to remove marine litter from otherwise inaccessible sections of coastline using sea kayaks and other manpowered vessels. Such inaccessible places are important to be kept clean from litter since they are vital refuges for wildlife. As part of this project, kayaks have been developed through the Odyssey Innovation company which are made from recycled high-density polyethylene and which can be used for these clean-up activities. Recycling of ALDFG and other recovered marine litter is also a vital part of the activities and a more circular economy approach looking at recycling infrastructure and processes is advanced through Odyssey Innovation.

Fathoms Free also works with fishermen to recover ALDFG for re-use in a way to mitigate the local impact that ALDFG has on fish stocks. Additionally, the wider public is engaged to raise awareness of the issue through beach cleans and at regattas, conferences and marine discovery days, as well as through art and other media.

2.2. Diving for ALDFG

Since the first removal dive in 2014, Fathoms Free has contributed to the Dive Against Debris programme (active in 114 countries around the world, with more than 50,000 divers participating) which removed ALDFG and contributed to citizen science. Fathoms Free itself has a group of volunteers with a wide variety of skills which cover diving, towing a boat, training, boat trailer repairs, boat maintenance, social media, raising awareness online, attending awareness events, sorting and cataloguing retrieved materials, dive gear maintenance, project planning and management, project administration and dive planning and safety.

2.2.1. Licensing

Until recently, a license from the **Marine Management Organisation** (MMO) was required for the removal of ALDFG and Fathoms Free worked with the MMO to develop a fast track application system. However, since then requirements have changed, no longer requiring a license if MMO guidance for recreational divers is adhered to. This exemption is not valid if a site is of historic interest or a marine protected area may be damaged. As these terms are open to interpretation, Fathoms Free consults with Natural England, Historic England and the Ministry of Defence as a matter of good practice.

2.2.2. Safety procedures

Fathoms Free was closely involved with the MMO in developing the guidance for divers recovering fishing gear. This guidance states the following on diver safety in brief:

- All divers should be sufficiently qualified by accredited organisations to the required maximum depth and for any gas mixture used.
- Any removal activity should start with a clear briefing which (besides standard dive safety) should cover specific site characteristics and removal activity hazards,as well as risk mitigation procedures.
- Pre-dive checks must be conducted covering all equipment to be used for dive and removal activities.
- There must be pre-arranged signals to halt activities and other likely actions during the work.
- All equipment should be as streamlined as possible to minimize the risk of entanglement.
- Divers work in teams.
- One diver works on the ALDFG while the other watches for hazards.
- Only one team works on a piece of ALDFG at a time.

- Divers should carry sufficient additional gas for the use of lift bags. Deeper recoveries and lift bags larger than 20kg should use an independent source of gas for lifting.

For a full overview, see guidance see the full report on recovery of abandoned, lost and discarded fishing gear[1].

After consultation with the Diving Diseases Research Centre, Fathoms Free decided to stay within no-decompression limits during dives, as going into decompression whilst undertaking underwater retrieval activities increases the risk beyond a safe threshold. As most recreational divers are not used to working underwater, ALDFG removal work can drastically increase air consumption beyond normal expectations for depth and dive time. Additional issues, such as buddy separation due to loss of visibility because of resuspension of sediment and risks of entanglement during lifting operation, led Fathoms Free to decide that risk management required dives to not extend into decompression time.

To analyse risks and mitigation actions thereof, Fathoms Free has developed risk assessments for general diving (Annex 1) and specific survey and retrieval activities (Annex 2). These analyse hazards and score them according to severity and likelihood. Actions and procedures to control those hazards are then defined with a corresponding score for severity and likelihood when they are implemented. Additionally, a dive risk assessment (Annex 3) is filled out per site visit on which environmental conditions are recorded as well as a safety chain to contact emergency services. This check list needs to be filled out per site visit which covers required safety actions and participating divers need to sign the risk assessment to confirm understanding of the activity.

The use of a self-owned Rigid Hull Inflatable Boat (RHIB) allows Fathoms Free the option to cancel activities when weather deteriorates, or there are other issues which change the safety situation for the activity, without incurring large financial losses. As Fathom Free states: "…our crew and divers' safety is of utmost importance to us and won't be compromised upon".

2.2.3. Site selection

Fathoms Free relies on reports from local divers, fishers and the general public on sightings of ghost gear. When a report comes in, it is discussed whether the situation asks for prioritisation over already planned activities. Limited resources require a focused approach, making exploration of sites without clear reports on the presence of marine litter undesirable. Decisions on clean-up activities are further based on the amount of ALDFG present, safety of the team (local boat traffic and currents), accessibility, required licenses already in place for that location and special site designations (used by Ministry of Defence, nature reserves, protected wreck sites).

2.2.4. Dive activities

Reports of ALDFG sightings are first followed up using the RHIB vessel owned by Fathoms Free. A Seasearch survey is performed on site to record the presence of ALDFG, status of the environment and any entangled species. From that survey, a removal plan is developed to minimize disturbance to the environment by the work.

An important part of the first survey is to verify that the fishing gear is indeed abandoned, lost or discarded, as removal of active fishing gear is strictly prohibited according to government guidance. The gear is,

[1]https://www.gov.uk/government/publications/recovery-of-abandoned-lost-and-discarded-fishing-gear

therefore, closely observed during the survey to ensure there are no lines to the surface through which fishermen could retrieve the gear at a later stage. To ensure good relations with fishermen and their communities for raising awareness on the effects of ALDFG, it is vital to not interfere with their sources of income.

During a second dive, divers will free the ALDFG and attach lift bags in two-person teams, where one diver follows the brief and the other monitors for hazards. If possible, within safety limits, the ALDFG is lifted during that dive. Otherwise, this will be done during a third dive. If the ALDFG is small enough, it is recovered using Fathom Free's RHIB (Figure 3). If there is too much material, the gear will be retrieved by a pre-arranged commercial vessel. Subsequently, the gear is transported to port where it is processed for recycling.

If items have become a valuable part of the marine habitat, they may not be recovered, but their risk to wildlife is minimized by, for example, cutting netting. If ALDFG is fixed to a historic feature, such as a shipwreck or aircraft, no part of the wreck is interfered with. Minimal force is used during the activities and no machinery is used to minimize the impact on the area.

Figure 3:A fishing net being lifted into the RHIB. Image provided by Fathoms Free.

2.2.5. *Environmental concerns*

Fathoms Free bears potential impacts on the environment in mind for all removal activities. In site selection for surveys, potential carbon emissions due to using vessels are considered and the need for travel is evaluated. When using vessels, the WiSe guidelines[2]are used to minimise disturbance of marine wildlife. When removing gear, the impact of the activities is assessed, and a decision is made whether removal would create more disturbance to the habitat than leaving in place. If gear is left in place, actions are taken to minimise the risk to marine life.

2.2.6. *Disposal*

Sustainable disposal of ALDFG is complex since the gear is often encrusted by organic matter (Figure 4) and recycling of fishing nets is limited as there are currently only two facilities in Europe which are able to do this. Often the only option is landfill. The closely associated activities, through Odyssey Innovation and a collaboration with PlastiX Global, work on recycling of fishing nets and other plastic marine litter. These activities remove the costs of disposing of fishing nets and are motivating fishing communities to also bring in other gear they found at sea for recycling.

Figure 4:Fishing gear collected by Fathoms Free encrusted by marine life. Image provided by Fathoms Free.

[2]https://www.wisescheme.org/

2.2.7. Data management

After the ALDFG and other Litter is collected, it is sorted (Figure 5) and counted into 8 different materials (plastic, metal, paper, cloth, wood, rubber, glass and mixed materials), which comprise 100 categories of specific items or size classes thereof. The total weight per removal activity is recorded, as well as metadata for the activity (GPS coordinates, depth, weather, number of participants, number of entangled marine life, etc.).

The data obtained is kept up to date in an Excel spread sheet and shared with the PADI Project AWARE Dive Against Debris Programme to contribute to their global marine Litter database.

Figure 5: Sorting retrieved marine litter. ImageprovidedbyFathoms Free.

2.2.8. Results

Since 2014, 75 dives have been performed on the shores of Cornwall, Devon and Dorset in southwest England (Figure 6). In those dives, 2,588 kg of litter were removed by teams ranging from 2 to 15 divers, an average of 34.5 kg per dive and maximum in a single dive of 213 kg. Looking at abundance, in total 37,150 litter items were collected. The average per dive was 482 items and the maximum in a single dive was 4843 items. Of those 4843 items, 4808 were fishing lines, lures, hooks, sinkers and rods.

Figure 6:Sites where Fathoms Free has dived to remove ALDFG and other marine litter. Map data copyrighted OpenStreetMap contributors.

Breaking the abundance of items collected down into material categories, plastic is clearly the most collected material (64%), followed by metal (30%) and cloth (4.5%) (Figure 7).

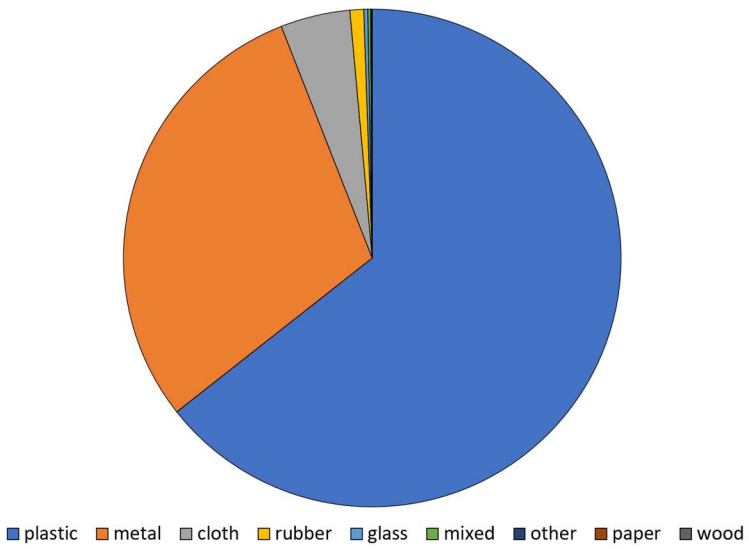

Figure 7:Composition of marine litter collected by Fathoms Free.

Ranking the most abundant categories, 76% of all items collected were fishing lines, sinkers, lures, hook, and rods (Table 1). Other fishing related categories in the top 10 by abundance were ropes (4%) and fishing nets

(1%). It should be noted here that abundance data says nothing about the size and weight of collected items. Weight data is not available per category, only as a total per survey. However, items which would be expected to be heavier, for example, fishing nets come in at only number 8 in abundance (415 collected) while smaller fishing-related categories are the top categories. Unidentifiable plastic fragments comprise 8% of collected items. Such fragments are often among top marine litter categories, since larger items fragment at sea due to UV radiation and physical stresses. The top 10 categories consist of the materials plastic (6), cloth (2), metal (1) and rubber (1). Of further note is the number 9 position of plates, cups and cutlery.

Table 1:Top 10 abundant marine litter categories collected during Fathoms Free removal dives.

Category	Count	Percentage
fishing: line	13579	37%
fishing: sinkers, lures, hooks	10543	28%
fishing: lures, rods/poles	3949	11%
Plastic fragments	2954	8%
rope (&nylon)	1426	4%
clothfragments	928	2%
towels, rags	545	1%
fishing: nets & pieces of nets	415	1%
cups, plates, forks, knives, spoons	409	1%
Rubber fragments	257	1%

Entangled organisms were logged per survey and were found in 32% of surveys. In all cases, crustaceans were entangled, ranging from a single crab or lobster to more than 20 crabs. Catsharks and other fishes were each found entangled in 5% of surveys and in 1 survey a starfish and sea urchin were entangled.

2.3. Case study

To analyse costs and results of the diving for ALDFG, Fathoms Free was provided with funding for three two-day site visits by four divers and two crew members. The costs and results of those activities will be further discussed below.

2.3.1. Costs

The budget for the case study breaks down into costs for gear use, licenses, insurance and accommodation, as well as costs for personnel hours to process data and paperwork (Table 2). The activities were performed over six dive-days across three sites, with two dives each day, comprising four dives per site and twelve dives in total.

Table 2:Costs of three weekends of diving activities to remove ALDFG and other litter.

Budget category	Project task	Cost
Survey and retrieval	Hire of a dive RHIB (6 days)	£2,100.00
	MMO License 3 sites	£150.00
	Ghost gear insurance annually payable in August	£436.00
	Accommodation 6 people 6 nights	£705.20
Subtotal		£3,391.20
Data management and licenses staff costs	MMO license submission 3 x 4h	£240.00
(£20.00 per hour)	Data reporting 12 x 2h per dive	£480.00
Subtotal		£720.00
Total		**£4,111.20**

The overview of activity costs (Table 2) gives a good idea of what running such an operation can cost. The vessel hire turned out to be more expensive than estimated in the budget because a larger vessel had to be chartered. The MMO license and submission labour costs are no longer necessary since the MMO no longer requires a license for ALDFG removal. However, as Fathoms Free indicates, it would be good practice to avoid differences in interpretation by discussing with government organisations before any removal activities, so some time should be invested in this activity. The ghost gear insurance in the overview is an annual cost, so would be spread out across more removal activities than just the twelve in this case study. Not included in the budget are fuel costs and service of dive and retrieval gear.

2.3.2. Results

The twelve dives in the case study were performed over three weekends in May, June and July 2019. Four dives were done near Torquay and eight dives near Falmouth in southwest England (Figure 8).

Figure 8: Locations of the twelve litter removal dives for the case study.

Across all 12 dives, 716 kg of marine litter was collected with a range of 12 kg to 213 kg per dive. The average weight of litter removed per dive was 60 kg, almost twice the average of all dives done by Fathoms Free. The number of items collected ranged from 32 to 1527 items per dive. Strikingly, the dive with 213 kg collected was also the dive with just 32 items collected, indicating the difference when investigating weight versus abundance of marine litter.

The main materials collected were very comparable with the overall data, with 65% comprising plastic and 34% metal (Figure 9).

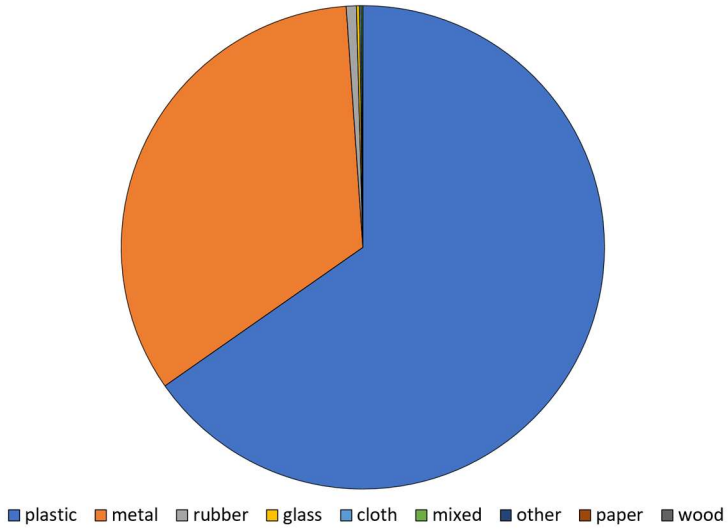

Figure 9:Composition of marine litter collected for the case study.

The top 10 categories collected in the case study was very comparable to that of the whole Fathoms Free data set as 90% of all items collected were fishing lines, sinkers, lures, hook, and rods (Table 3). Overall, 7 out of 10 categories were the same as for the whole data set, however, the other three categories in the top 10 here consisted of various beverage containers.

Table 3:Top 10 abundant marine litter categories collected during the case study dives.

Category	Count	Percentage
fishing: line	1529	34%
fishing: sinkers, lures, hooks	1447	33%
fishing: lures, rods/poles	1039	23%
rope (&nylon)	141	3%
plasticfragments	117	3%
fishing: nets & pieces of nets	31	1%
beveragecans (aluminium)	29	1%
beverage bottles: 2 liters or less	28	1%
rubberfragments	28	1%
beveragebottles	9	0%

3. Conclusion

The case study provided a good estimate of the results normally obtained by Fathoms Free in their removal activities, as well as the material and categorical composition of the removed litter. The case study results were shown to be comparable to the total litter removed by the organisation since 2014, although the average weight of litter removed is substantially higher than the average over the whole period. Making a direct comparison between costs and results is tricky, since costs include items which cover more time than just the case study period, however, a rough estimate over the case study activities results in £5.74 per kg of marine litter removed. The costs of ALDFG and other litter in the marine environment are influenced by many factors. Mouat et al. (2010) pooled available information for the northeast Atlantic region of Europe. They state that UK municipalities spend €18 million annually (€146,000 per municipality) in cleaning up beach

litter, but that the potential economic impact of taking no action outstrips these removal costs. Marine litter impacts coastal tourism worth billions of euros and impacts Scottish fisheries for more than €10 million per year. A case study of the relatively small Shetlands Islands economy (population 22,000) found an impact of more than €1 million per year (Mouat et al. 2010). Major differences between Fathoms Free and municipal cleaning are, most notably, that Fathoms Free runs on volunteers and that municipal cleaning is limited to beaches and shores. While the ALDFG and other litter that Fathoms Free removes is not visible to the general public, it does impact fisheries and can be a navigation hazard. ALDFG has a negative impact on the environment, removal of gear in an environmentally friendly way lessens that impact. Prevention of gear being lost or discarded and entering the marine environment is priority. However, this was a case study to show a best practise example of how ALDFG can be removed by a volunteer organisation, at a relatively low cost, whilst raising awareness of the problem.

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Annex 1: **Example FATHOMS FREE RISK ASSESSMENT FORM**

The object of this risk assessment is to communicate the risk management requirements, through identifying hazards and managing the identified risks.

Date:	**Activity: General diving**						**Risk Assessment No: 003** **Completed by:**				
	SITE AND LOCATION: Various, shore and boat – accessed site						**MMO Licence Number: N/A**				
Task Description	**Hazard** ***What could cause harm?***	**Hazard Effect Description** ***For each hazard identified describe effects (use checklist / knowledge / experience)***	**Unmitigated Risk** **Hazard Severity**	**Likelihood of Occurrence**	**Risk (from Matrix)**	**Controls (Prevention and Mitigation)** ***MINIMISE RISK BY:*** ***1 Reducing probability*** ***2 Reducing Hazard Effect*** ***3 Identifying Monitoring***	**Action By**	**Residual Risk** **Hazard Severity**	**Likelihood of Occurrence**	**Risk (from Matrix)**
	Slips, trips, falls	Injury to diver Damage to equipment	7	7	49	All divers to adhere to no running rule, particularly over the rocks on the entry, slippery when wet or covered in weed. Briefdiversaboutwalk to entrypoint, Kitting up.	Dive Manager, alldivers	7	2	14
	Drowning, DCS or other diver injury or illness	Injury to diver, death	9	3	27	All divers are suitably qualified for the type of diving undertaken. Diver qualifications are checked by Dive Manager for all divers prior to diving. At least two people to be O2/First Aid trained. All divers to have completed an annual self-declaration medical form.	Alldivers	9	1	9
	Low visibility caused by silt disturbance	Diverseparation, disorientation	5	7	35	All divers adhere to the dive separation procedures. Abort dive if necessary. Good buoyancy control and correct finning technique. Aim to minimisesiltdisturbance.	All people involved in the expedition	5	6	30
	Entanglement	Panic, injury to diver, running out of air, death	7	3	21	Ensure buddy procedures in place. Ensure all divers have at least two cutting implements and some means of attracting attention. Divers to be advised by Dive Manager, prior to dive, of any fishing gear expected on the site.	All people involved in the expedition	7	2	14
	Overloading (carrying too much weight of debris)	Poor buoyancy control, exertion, increased use of breathing gas	4	7	28	Dive Manager to brief all divers to not exceed approximately 4kg. Not to use drysuit/personal buoyancy aid to compensate for the weight of the debris. Discard the debris if found too heavy to safely carry on a dive. End dive as soon as the maximum safe load is collected.	All people involved in the expedition	4	2	8
	Is Residual Risk Tolerable / ALARP?									

Annex 2: FATHOMS FREE SURVEY AND RETRIEVAL RISK ASSESSMENT FORM

The object of this risk assessment is to communicate the risk management requirements, through identifying hazards and managing the identified risks.

Date: 28/09/2017	**Activity: Fathoms Free diving activities - Survey and Recovery of Abandoned, Discarded and Lost Fishing Gear and other plastic debris**	**Risk Assessment No: 005**
	SITE AND LOCATION: Various dive sites in accordance with Marine Management Organisation (MMO) licence	**MMO Licence Number: _____**

Task Description	**Hazard** ***What could cause harm?***	**Hazard Effect Description** ***For each hazard identified describe effects (use checklist / knowledge / experience)***	**People Environment, Asset Reputation Affected**	**Unmitigated Risk**			**Controls (Prevention and Mitigation)** ***MINIMISE RISK BY:*** ***1 Reducing probability*** ***2 Reducing Hazard Effect*** ***3 Identifying Monitoring***	**Action By** ***Person and Date***	**Residual Risk**		
				Hazard Severity	**Likelihood of Occurrence**	**Risk (from Matrix)**			**Hazard Severity**	**Likelihood of Occurrence**	**Risk (from Matrix)**
Survey and Recovery of Abandoned, Discarded and Lost Fishing Gear and other plastic debris	Monofilament line/Ghost Nets	Entanglement, Out Of Air Situation, Rapid Ascent	P,R	5	E	HIGH	Delegate 1 diver in each team as safety observer/assistant with minor tasks Each diver to have at least 2 means of cutting line accessible to them while dived In the course of dive planning, due consideration shall be given to air/gas mixture, cylinder capacity, individual diver air/gas breathing rates, anticipated activity levels, operating depth, tides & currents and task loading. A reserve air/gas pressure is to be agreed upon prior to starting the dive that is sufficient to allow a safe ascent and suitable safety stop. Two independent breathing air sources to be carried at depths greater than 20 metres Diver's equipment to be assessed and modified if required to reduce snag hazard Buddy checks to be adhered to during dive	JZ 31/12/17	5	B	MED
	Poor visibility	Entanglement, Out Of Air Situation, Rapid Ascent	P,R	5	E	HIGH			5	B	MED

	Cutting Equipment	Drysuit failure/BCD rupture/loss of buoyancy/injury	P,A,R	5	E	HIGH	Delegate 1 diver in each team as standby and safety observer Each diver to have at least 2 means of cutting line accessible to them while dived Minimum 15 Litre cylinder at depths greater than 20 metres Independent Air source to be carried Diver's equipment to be assessed and modified if required to reduce snag hazard Buddy checks to be adhered to during dive		5	B	MED
	Lift Bags	Rapid ascent, Out Of Air situation, impact injury from falling load	P,R	5	E	HIGH	Cutting equipment to be sheathed when not in use and when bagging freed material Divers to maintain sufficient distance from each other when cutting is in progress		5	B	MED
	Sharp items of debris e.g. embedded hooks	Laceration or needlestick injury/ drysuit failure/BCD rupture/loss of buoyancy/injury	P,A,R	5	E	HIGH	Lift bags to be inflated to either to neutral buoyancy or minimum positive buoyancy required to bring to surface Divers to be SQEP in lifting operations in accordance with agency specialty or SDC or FF in-house training		5	B	MED
	Task Loading & Perceptual Narrowing	Out of Air Situation/Buddy Separation	P	5	E	HIGH	Suitable gloves to be worn at all times Cease retrieval operations or leave in situ if presence of sharps is suspected Do not pull on monofilament line if presence of sharps is suspected		5	B	MED

							Cease retrieval/survey activities and focus on dive basics Cease dive and ascend to surface				
Have All Reasonably Practicable Controls Been Taken?									**Is Residual Risk Tolerable / ALARP?**		
Risk Assessment – Name and Signature											

Annex 3 Fathoms Free –Example Dive Risk Assessment

Location:	Date:	Dive Manager:	Assistant Dive Manager:	Risk assessment carried out by: Name: Position: Signed: Date:

Location Phones/Radio. Mobile phones in cars (make sure that there are phones available)	**UK EMERGENCIES AT SEA:** **Coastguard: VHF DSC/Channel 16** **Lives in Danger: MayDay**	First Aid/Oxygen Administrator:	Deputy First Aid/Oxygen Administrator:
Location Nearest A & E Facility:	**UK EMERGENCIES ON LAND:** **DCI: 999 (Coastguard)** **Near Drowning: 999/112 (ambulance)** **Lost Diver: 999/112 (police)**	Location First Aid /Oxygen Kits:	Access to First Aid/Oxygen:
Weather Forecast:	Wind Direction and Speed:	Air Temperature:	Anticipated Water Temperature:
High/Low Water Time: Low: High: Slack:	Tide/Current:	Surface Conditions:	Anticipated Visibility:

Has a Risk Assessment been completed for the location/diving activity?	Yes	No

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Are the factors identified in the Risk Assessment still valid?	Yes	No
Are all the conditions (visibility, tide, sea state, ambient light, etc.) suitable for the planned dive?	Yes	No
If required, has the Coastguard been notified of the intended activity?	Yes	No / Not applicable
Are all the divers qualified for the dive or accompanied by a competent instructor if training (DAD and Seasearch only)?	Yes	No
Are oxygen and first aid kits available on site and have they been checked and found functional?	Yes	No
Have First Aid/Oxygen Administrators and deputies been appointed (at least two)?	Yes	No / Not applicable
Has the Dive Manages checked that the Diving Incident Report Sheet and Casualty Assessment Form are present?	Yes	No
Has a pre-dive briefing been conducted and responsibilities explained?	Yes	No
Have diver separation and diver recall procedures been explained?	Yes	No
Has all the equipment being used been inspected and found functional for the dive objective by the personnel responsible (all divers including any stand-by divers)?	Yes	No
Have all the divers (including any stand-by divers) confirmed they are fit, well and happy to dive?	Yes	No
Have any known underwater risks or hazards been identified to the divers?	Yes	No
Is there a suitable access and egress point and have the divers been briefed on alternatives if available ?	Yes	No
Have Dive Leaders been briefed on the need to carry out a briefing to buddy/ies? (Dive Leaders need to notify the Dive Manager about any training or anything out of the ordinary planned)	Yes	No
Have all divers been advised of their actions in the event of an emergency? (See Diving Accident Management Flowchart)	Yes	No
Has the buddy check been carried out by all buddy pairs?	Yes	No
Have all personnel involved in the dive been entered on the Dive Log Sheet?	Yes	No

I, the undersigned, confirm that I have read the relevant Risk Assessments Assessment relating to the dive.

I have completed a self-certification medical form within the last year. I am medically, physically and mentally fit to dive.

Signed: Date: Print Name: Emergency Contact: Emergency number:	Signed: Date: Print Name: Emergency Contact: Emergency number:	Signed: Date: Print Name: Emergency Contact: Emergency number:	Signed: Date: Print Name: Emergency Contact: Emergency number:
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Centre for Environment Fisheries & Aquaculture Science

Cefas

About us

We are the Government's marine and freshwater science experts. We help keep our seas, oceans and rivers healthy and productive and our seafood safe and sustainable by providing data and advice to the UK Government and our overseas partners.

We are passionate about what we do because our work helps tackle the serious global problems of climate change, marine litter, over-fishing and pollution in support of the UK's commitments to a better future (for example the UN Sustainable Development Goals and Defra's 25 year Environment Plan).

We work in partnership with our colleagues in Defra and across UK government, and with international governments, business, maritime and fishing industry, non-governmental organisations, research institutes, universities, civil society and schools to collate and share knowledge.

Together we can understand and value our seas to secure a sustainable blue future for us all, and help create a greater place for living.

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Innovative, world-class science is central to our mission. Our scientists use a breadth of surveying, mapping and sampling technologies to collect and analyse data that are reliable and valuable. We use our state-of-the-art Research Vessel Cefas Endeavour, autonomous marine vehicles, remotely piloted aircraft and utilise satellites to monitor and assess the health of our waters.

In our laboratories in Lowestoft and Weymouth we:
- safeguard human and animal health
- enable food security
- support marine economies.

This is supported by monitoring risks and disease in water and seafood; using our data in advanced computer models to advise on how best to manage fish stocks and seafood farming; to reduce the environmental impact of man-made developments; and to respond to serious emergencies such as fish disease outbreaks, and to respond to oil or chemical spills, and radioactivity leaks.

Overseas, our scientists currently work in Commonwealth countries, United Kingdom Overseas Territories, South East Asia and the Middle East.

Our customer base and partnerships are broad, spanning Government, public and private sectors, academia, non-governmental organisations (NGOs), at home and internationally.

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