THE USE OF ‘RASCO’ GILLNETS IN THE ANGLERFISH, KING CRAB AND DEEP-SEA SHARKS FISHERIES IN THE NORTH-EAST ATLANTIC:

The need for their urgent closure as a preventative measure and views on their future viability as an example of sustainable fishing in the Common Fisheries Policy (CFP).

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Summary

- Every day, more than 6,000 kilometres of fixed gillnets ('rasco' or anglerfish nets) are deployed in the waters of the North-East Atlantic to catch anglerfish, deep-sea red crab and deep-sea sharks.

- The poor selectivity of these nets, together with the length of time they are left in the water, means that many of the creatures they catch are rotten or in a damaged state when they are brought in. This has meant that up to 71% of the anglerfish catch has had to be discarded.

- The catches of deep-sea sharks by these fleets, particularly Portuguese dogfish and leafscale gulper shark, have contributed to the depletion of these stocks, which are currently on the verge of collapse.

- Most of the vessels involved in this fishery are registered in the United Kingdom, Germany and even under flags of convenience, but almost all the boats belong to Spanish companies and operate out of Galician ports.

- A single vessel can use up to 400 kilometres of net, which is 36 times the net size permitted in Spain. This size is much higher than what a fishing boat is able to efficiently manage, and so part of the net ends up being lost at sea, generating more than 1,000 kilometres of wastage and "ghost nets" every year.

- Despite the danger of overexploitation of some stocks of anglerfish, the quotas proposed by scientists have been repeatedly ignored by politicians and, particularly in the last three years, a volume of anglerfish has been caught that is far higher that what is permitted and regarded as sustainable.

Fishing Zones

The gillnet fishery in the North-East Atlantic (NEAT) stretches across the whole continental shelf and slope from the north of the Shetland Islands to south-west Ireland, in waters belonging to the European Union, Norway and a section of international waters at depths of between 150 and 1,200 metres.

This fishery therefore takes place in ICES sub-divisions VIa, VIb and VIIb, c, j and k, and may extend into other areas such as IVa and XII or different sub-divisions in areas VII and VIII. The fishing grounds of Hatton Bank, the western part of the Rockall Bank, the south of Porcupine Bank (49ºN to the south of Rockall Bank) and Tampen (61ºN to the north of the Shetlands) are in international waters.

Rockall and Hatton Bank are seamounts, very close to the United Kingdom EEZ (Exclusive Economic Zone). They are very special ecosystems with unique ecological characteristics, a huge variety of species and large communities of deep-sea corals covering them. Rockall Bank is within ICES area VIb. It rises up from a depth of over 1,000 metres with its highest peak lying less than 65 metres under the surface. It lies beyond the continental shelf, with a small section

inside the 200 nautical miles that belongs to the United Kingdom's EEZ, and the rest in international waters.

Until 1997, the EEZ limit of the United Kingdom encompassed the waters within a 200 nautical mile radius around Rockall Bank. However, in that same year an agreement was signed in the United Nations Convention on the Law of the Sea whereby the British government relinquished its jurisdiction over these waters and Hatton Bank and the western part of Rockall went to form part of international waters. The immediate result of this agreement was the deregulation of fishing in this area and a lack of control. Although previously there had been no regulation over the catch quotas in these fisheries, there had at least been some form of monitoring and surveillance of the international fleets authorised to operate in these fishing grounds.

Regrettably there is no true and reliable data on the gillnet fishery carried out in this area; we have only been able to obtain information from a few fishing grounds and there is no data on the catches by boats operating in international waters.

The new possibilities that have been opened up since the signing or renewal of EU fisheries agreements has made it possible for some vessels that used to operate in these fisheries to operate now in the waters of Western Africa, particularly in the areas of Mauritania and Senegal. Meanwhile, through vessel leasing arrangements with non-community countries, some of these boats have also headed for the waters of the Western Atlantic, specifically Brazil, where they have been working for several years now. Furthermore, a Spanish company (from Galicia) has asked for permission to start an experimental gillnet fishery in Argentinean waters.

Fishing gear

These fisheries use the *rasco,* a gillnet for anglerfish, to make their catches. There is a fleet dedicated to fishing on the continental slope and another for deeper waters, but the equipment used by both of them is very similar. The *rasco* is a gillnet fixed to the seabed made up of various rectangular nets linked together. It is maintained in a vertical position by a head line of buoys and a foot line of ballast or weights.

Generally speaking, fishing with gillnets, whether deep-sea or superficial, is fairly standard. There are variations in the size of the pieces of netting or the size of the mesh, depending on the target species. While gillnets for anglerfish (*rasco*) tend to have a mesh of between 220 and 280 mm, the nets used for catching shark have a smaller mesh: around 160 mm.

There are various estimates on the amount of net used and the length they reach. Norwegian coastguards have put this figure at almost 3,000 pieces of net making up the nets deployed in their waters, but according to information from the Scottish Fish Protection Agency (SFPA), each vessel may deploy a total of 5,000-8,000 net sections on every trip, which lasts approximately five days. The net sections tend to be deployed in groups of 300-500, reaching lengths that can exceed 20 kilometres. A fishing boat can deploy various sets of nets over the course of several days in very extensive areas until it has between 250-400 kilometres of nets in the water at the same time. It is calculated that there are some 5,800-8,700 kilometres of net in permanent use in this fishery[1].

The normal procedure is to make an advance reconnaissance of the fishing zone in which just 50-100 net sections are deployed, and if the fishing ground looks like being productive all the nets are cast. In normal conditions, the gillnet stays in the water for 3-4 days, but it is not unusual for nets to be deployed for much longer (5-10 days) if the sea is rough. In any case, the huge amount of nets used tends to make it impossible for the fishermen to bring them all in at one time and part of them are left at sea while they take their catches to be landed. For this reason, the time that some of the nets remain in the water can exceed several weeks.

Based on data on gillnet vessels operating in the area in 2003, an estimate has been made of the fishing effort of vessels flying a British flag and fishing in Scottish waters[2]. It was calculated that an effort of 1,078 days was made, not taking into consideration bad seas and weather conditions that could double even this period of time. For boats registered in Germany in 2003, the time between setting and bringing in the nets was calculated at 803.29 days for the crab, shark and anglerfish fisheries. These figures are probably very much lower than the genuine fishing effort involved.

Fleets

The vast majority of vessels in these fisheries are based in Spain, specifically in Galician ports. However, for reasons of convenience, they are all registered under the flags of the United Kingdom, Germany and other non-EU countries such as Panama, Belize and St. Kitts and Nevis *(see annex I)*.

Fishing with gillnets in the fishing grounds of the NE Atlantic started in the middle of the 1990s. There are two fleets dedicated to the different fisheries. The first concentrates on catching anglerfish and operates within the limits of the continental shelf in waters with depths of 200-600 metres. The other fleet operates in areas beyond the continental slope at depths of 800-1200 metres and is mainly dedicated to catching deep-sea sharks.

The shallower fishing ground on the continental shelf was started in 1994-95 in ICES sub-division VIIb-k and was tremendously productive at the outset, with catches of 300-400 tonnes of anglerfish a year. In 1996 it was expanded to ICES areas VI and IVa and the international waters at Hatton Bank and West Rockall.

Between 1995 and 1999, the fleet increased in both numbers and size of vessels, going from 15 boats of 20-30 metres to 50 boats of up to 40 metres operating in these fishing grounds. In addition to this major increase in the fleet, freezer systems were installed in all the boats to improve the conditions in which the fish reached the consumer.

While non-freezer vessels were permitted maximum trips of 10-14 days if they intended to sell the fish fresh, the arrival of the freezer vessels meant a considerable increase in the length of trips. All this caused an increase in the fishing effort between 1997 and 1999 and the CPUE (catch per unit effort) dropped in 2000-01 until it was no longer sustainable economically. Today there are around twenty boats in this fishery, of which more than two-thirds are flying a British flag.

Meanwhile, fishing with fixed gillnets in deeper waters started in 1992 with the change of fishing gear by some longliners which had been catching deep-sea sharks, and from 1991 started exploiting these fishing grounds. In 1992 fishing started in ICES sub-division VII between the

Irish Sea and the west of the Grand Sol, with catches of 40 tonnes of shark per week. In the beginning only the livers of the sharks were landed, the rest being discarded. Later on there was a proliferation in the sale of shark meat and fins, and they started being landed whole. By 1999 the entire deep-sea shark was being commercialised for human consumption. At present, all these boats are freezer vessels and can be away for up to 8 weeks if they do not fill their holds before that time.

The deep-sea shark fishery reached its peak in 2000, with 15 vessels working in the waters of the North-East Atlantic. A rapid drop in the productivity of this fishery resulted in a reduction of the fleet to 7-8 vessels in 2001. This drop had a positive effect on the fishery and it became profitable once again, so some of the vessels returned, with the fleet once again exceeding ten boats.

Many vessels change their names every so often to make it difficult for the competent authorities to track them, which makes it very complicated to control irregularities.

With regard to the fishing effort, the only data available related to 2003. In that year there were a total of 23 boats registered for this fishery in the United Kingdom, and six in Germany. It is very difficult to quantify the actual fishing efforts of these fleets as on the one hand the amount of time that the nets are left unattended between trips is unknown, while on the other a large part of the fishing effort takes place outside EU waters, in the NEAFC zones, and fishing operations involve various jurisdictions and competent authorities.

Another major problem is the conflict between gillents and other fishing gear operating in the same areas, particularly with bottom trawlers. As there are no geographical demarcations for each type of fishing gear, on many occasions coincide, causing the loss of damage of gear. This causes the loss of numerous fishing nets which are simply abandoned at sea.

Species

Deep-sea species are regarded as those that spend the majority of their lives more than 400 metres beneath the surface. Anglerfish (the *Lophiidae* family), deep-sea sharks (*Centroscymnus coelolepis* and *Centrophorus squamosus*) and king crab (*Chaceon affinis*) are the target species of gillnet operators in NE Atlantic fisheries.

One of the main target species in this area is anglerfish (*Lophius sp.).* Anglerfish has been the traditional catch of *rasco* nets, but as it became scarcer in surface waters it has been sought at greater depths, as it lives between 20 and 1,000 metres[3], although certain fish have been found at depths of up to 2,600 metres[4].

In accidental catches at the greatest depths, numerous deep-sea sharks started being caught which went on to become a target species for certain fleets. Different kinds of fishing gear are also used for catching deep-sea sharks, such as longlines and bottom-trawling.

The deep-sea sharks caught by the gillnet fishery belong to the *Squaliform* order. As mentioned earlier, the two main species are the gulper shark (*Centrophorus squamosus)* and the Portuguese dogfish (*Centroscymnus coelolepis)*. Both of these are ovoviviparous[5], with a long gestation period, slow reproductive rate and great longevity, which makes them extremely vulnerable to overexploitation. The Portuguese dogfish can have up to 10 offspring after a long

gestation of 26 months[6], while the leafscale gulper shark normally has 14 offspring per birth and also has a very long gestation period.

These animals distribute themselves in the water column at different depths according to their age and sex. Females and juveniles tend to be found at greater depths than adult males, which has a very important impact on the fishery, as we will see further on.

As has occurred with other species, the deep-sea red crab *(Chaceon affinis)* has gone from being an accidental catch to a target species in the deep-sea fisheries of the North East Atlantic. This species is the largest of the Brachiurans geryonids of the North Atlantic, frequently found on seamounts and escarpments, normally at depths of over 500 metres. They do not reach maturity until their shell has a thickness of over 105-129 millimetres and the females tend to be smaller than the males[7].

Very little is known about the biology of deep-sea species. These fisheries may be having an impact on laying and reproduction areas, affecting seasonal behaviour and, in general, the normal development of certain species that may be very sensitive to changes in their environment.

The true state of the anglerfish stock in areas IIIa, IV and VI is unknown. Two different species have generally been landed under the generic name of 'anglerfish': white anglerfish or white-bellied monkfish *(Lophius piscatorius)* and black-bellied anglerfish *(Lophius budegassa)*. As in the case of deep-sea sharks, it has been difficult for scientists to evaluate and manage this species. Catches have shown an evident decline since 1996 and it is believed that the quotas granted are inappropriate for the sustainable management of this fishery[8]. The most recent ICES evaluations for areas VIIb-k and VIIIa-b indicated that this is an overexploited stock, *L. budegassa* being in a better state than *L. piscatorius*, and it was estimated that catch forecasts were higher than advisable. Up until now, the measures adopted by the EU do not seem to have had a positive effect; quite the contrary, there has been an increase in discards and unreported catches[9].

Some deep-sea sharks that are regularly caught by gillnet fisheries are already subject to unsustainable exploitation, such as the gulper shark *(Centrophorus granulosus)* which is classified by the IUCN as vulnerable. The data on CPUEs in longline shark fisheries in various ICES areas for combined catches of *Centrophorus squamosus* and *Centroscymnus coelolepis* show a decline of up to 80–90% in barely three years[10]. The IUCN regards *C. squamosus* as one of the species that is most sensitive to and most affected by overexploitation, and it has thus been classified as Vulnerable in the Red List. This is mainly due to the lower number of offspring per birth (between 5 and 8[11]), their greater longevity (up to 70 years old[12]) and the long time it takes them to reach reproductive age.

The deep-sea sharks *Centrophorus squamosus* and *Centroscymnus coelolepis* are k-strategy, i.e. with low fertility, late sexual maturity and fairly long-living, which could be a means of adapting to the scarcity of energy resources in deep waters[13].This prevents the populations from recovering quickly and leads to a greater short-term risk of overexploitation. Added to this is the problem of establishing minimum sizes for deep-sea sharks, as their maximum size and size at reaching reproductive age are very similar. For example, female *Centroscymnus coelolepis* grow to a maximum of around 120 centimetres and reach sexual maturity when they measure 95-100 cm[14]. The situation of *Centrophrous squamosus* is similar. They reach a slightly larger size, around 160 centimetres, but the females are not reproductive until they get

to 125 cm.[15]. Meanwhile, catching females can mean eliminating various generations of deep-sea sharks in one fell swoop due to their long gestation periods. The different bathymetric distribution of this species, depending on their age and sex, means that fishing at greater depths just exacerbates the problem, with an increase in the catches of juveniles in the case of *C. coelolepis* and females in the case of *C. squamosus* due to their preference for deeper waters[16].

Although the data available on many of these species does not give us an exact overview of their current state, it is known that some of them have suffered serious declines in recent years. For example, the spiny dogfish *(Squalus acanthias)* has declined by more than 60% in the last 25 years. Major declines in the CPUE of the leafscale gulper shark or Portuguese dogfish *(Centroscymnus coelolepis)* have also been detected, despite the fact that the fishery only started 14 years ago[17].

In the most recent analysis carried out by ICES on deep-sea sharks, scientists advised the European Union to close these fisheries and to classify these species, particularly the Portuguese dogfish and leafscale gulper shark, as depleted[18].

The development of the frozen crabmeat market has meant that king or red crab (*Chaceo affinis)* has now gone from being an accidental catch to a target species for certain vessels. The deep-sea red crab has already been shown to be vulnerable in other areas of the Atlantic, but the lack of studies that could properly regulate their catches has led to the exhaustion of certain stocks. For example, a fishery that started on the Galician Bank in 1988 collapsed within barely six years[19].

Home ports and landing zones

Although a large proportion of catches are landed and vessels re-provisioned in the home ports of this fleet, i.e. in Galicia, these vessels also visit some British, Irish and German ports, including Newlyn, Ayr, Falmouth, Brixham, Ullapool, Scrabster, Mallaig, Lochinver, Mildford Haven, Killybegs, Castletownbere, Fenit, Dingle, Cuxhaven and Hansestadt-Hamburg. In Galicia, La Coruña is the main receptive port for these catches although some vessels also dock in Vigo.

Recently, some of these vessels have extended their area of action thanks to EU fisheries agreements or through leasing arrangements in other countries. These boats can thus also be found in the waters of Western Africa and Brazil, and some of them land their catches in the ports of the Canary Islands, such as Las Palmas.

The compilation of data from different studies has enabled ICES to corroborate the huge increase in landings of deep-sea sharks by the gillnet fleet, although without being able to get any details on the diversity of species landed. In total, catches went from 486 tonnes in 1991 to 2,184 tonnes in 2000, and 5,174 tonnes in 2003, according to data on *C. coelolepis* and *C. squamosus* alone, there being no data for 2000 in the areas of IV, VI and VII for *C. squamosus* and the data in general being very incomplete[20].

The true figures for catches and landings in European ports are unknown, as there are only minimal controls by the competent authorities. There is practically no scientific data for these fisheries, and no direct evidence from observers on catches, the fishing effort or landings.

There is only a small amount of information on the composition of landings in 2003 in Scottish ports thanks to the FRS (Fisheries Research Services), but this represents a tiny part of this fishery, especially bearing in mind that the vast majority of these catches are landed in Spain. In general, there is very little control over the species reaching these ports, especially in the case of sharks.

Accidental catches and discards

The evolution of the fishery has meant that species such as deep-sea sharks and king crab have gone from being accidental catches to target species, especially for the deep-sea fishing fleet.

Accidental catches include various deep-sea species, such as forkbeard (*Phycis blennoides*), blue ling (*Molva dyptergia*), ling (*Molva molva*) and rays (*Raja sp.*).

There are several factors that influence the percentages of accidental catches and discards of the different fleets. Some of the most relevant of these are soak time, the depth of the fisheries, whether the nets are abandoned and the size of the mesh.

Anglerfish tend to be caught as an accidental catch in many fisheries, such as those of hake, megrim, sole, cod, plaice and Norway lobster. Although the species is mainly caught by bottom trawlers, in the United Kingdom 60% of catches are made by gill-netters and beam trawlers. The data resulting from the DEEPNET project[21] shows that the actual catch volumes, the impact on juveniles and discards could well be very much higher than estimates made up to now, and that much of this data has not been taken into account in scientific evaluations.

When counting the catches that reach the fish markets, hundreds of tonnes of fish, invertebrates, mammals and other organisms that are thrown overboard before the boats get back to port are unaccounted for. Therefore, the figures used to monitor what is being caught actually relate to landings, failing to account for a high percentage of total catches. For example, it is well known that in the case of bottom trawling only two of the numerous species of shark that are caught reach the fish markets, and the rest are thrown back to sea as discards. It would hardly be a surprise to find that this is the same situation with the gillnet fisheries. If the tonnes of fish that do not reach port were counted, the fleets would be far exceeding the TACs (Total Allowable Catches) established by the EU.

The soak time the nets are deployed is directly related to discards. These periods of time can be very long, especially if weather conditions are bad and make it difficult to bring in the nets.

The long periods of time that the nets are left in the water means that a large number of fish caught are in a state of decomposition or are seriously damaged when they are brought back in. For this reason, the average volume of discards observed in this fishery is 65%. And this figure only relates to anglerfish, not counting all the other species thrown overboard.

Another form of discard occurs when the parts of fish that are not going to be commercialised are thrown back in the sea. For many years the shark fisheries concentrated on obtaining their livers (and sometimes their fins) while the rest of the animal was discarded.

Loss of nets and "ghost fishing"

The majority of vessels do not have the physical capacity or enough time to bring in all the nets they have deployed. This means that hundreds of kilometres of net remain submerged for days or even weeks, catching numerous creatures while the boats go off to port to unload and return to the fishing ground. Given that the vessels can remain in port for 14 days between trips, and that the journey from the fishing grounds to port can take between one and four days to the United Kingdom and six to ten days to Spain, the length of time that these nets are left unattended can be up to five weeks. Obviously, the vast majority of catches, whether accidental or target, that are caught in these nets will not be fit for human consumption by this time and will be discarded immediately. On many occasions these nets are not even recovered because they weigh too much, or have been damaged or dislodged by trawlers, or simply lost.

As mentioned earlier, many nets are lost accidentally between trips because they cannot be recovered, but many others are intentionally ditched and thrown back to sea or abandoned on the sea bed when they break, get too old or are too difficult to bring back in. The time it takes for these nets to break down at the different depths is unknown, but it is believed that it takes many years before they are no longer a risk to marine species, becoming "ghost nets" that continue catching fish, mammals, turtles and other organisms for years. According to information provided by a shark fishing boat, on every average trip of 45 days, some 30 kilometres of nets are regularly ditched after being damaged. Taking as a reference the known fishing effort of the fleet operating in the area under study, it has been estimated that the annual losses of nets in this fishery would be 1,254 kilometres[22]. Given that estimates of fishing efforts are regarded as conservative, and that many other nets are not ditched but are lost or not recovered, the actual volume of nets left in the sea must be very much higher.

Legislation

The legislation for this fishery is not particularly well defined. For *rasco* gillnetting, according to the Spanish Official State Gazette[23], the minimum permitted mesh size is 280 mm; the maximum length of each section that makes up the net may not exceed 50 metres long and 3.5m high; the maximum total length of the fishing gear may be up to 11,000 metres (11 km)[23]. However, according to EU legislation, the minimum permitted mesh size for catching anglerfish and deep-sea sharks for fixed nets is 220 mm.

There is an exception in legislation (CE) 850/98 for anglerfish (*Lophius sp.)*. If this species is part of the accidental catches in a fishery in ICES sub-areas VI and VII and, as an accidental catch, it represents more than 30% of the total catches on board, then the minimum permitted mesh size for catching this species will be 250 mm, and not 220 mm as stipulated by EU legislation for anglerfish fisheries (included as "other marine species" in this legislation)[24].

There is no specific legislation for net sizes or minimum fish sizes for any of the four target species of the gillnet fishery in the North East Atlantic. Furthermore, there are no specific TACs for the fisheries of sharks and king crab.

The TAC for anglerfish in areas V (b1), VI, VII, XII and XIV is 29,768 tonnes (no TAC has been calculated for area IV relating to Norwegian waters), of which 5,952 tonnes correspond to the UK.

At present, fishing with gillnets has practically no legal restrictions, and so controlling these fisheries is almost impossible.

Since 1997, ICES has been calling for anglerfish catches in these North Atlantic fisheries not to be increased, or even reduced. Despite this, almost every year higher quotas than those recommended by scientists have been granted. In 2003, in view of a specific request from the European Commission[25], ICES manifested its concern at the high levels of discards and high catches of juveniles in the stock between areas VIIb–k and VIIIa and b. In the most recent debate on anglerfish quotas in the area in question, the EU decided to approve catches higher than recommended[26]. Thus for divisions IIa, IV, Vb, VI, XII and XIV catches between 40% and 50% higher than those proposed by the Commission were authorised**.**

The majority of elasmobranches caught by the European fleet or in European waters are not covered by any kind of quota system which means there are no catch limits on these species.

In the most recent allocation of EU fishing quotas for deep-sea species, the Commission[27] only established a quota of around 3,500 tonnes for "deep-sea sharks" in areas V, VI, VII, VIII, IX, X, XI and XII, which was subsequently increased by the Council of Ministers[28] to 7,000 tonnes and confined to two species: *Deania histricosa* and *D. profondorum*, despite the almost total lack of information on these species. Other sharks and elasmobranches were left without any catch restrictions, except in the case of spiny dogfish *(Squalus acanthias)* for which catches of just over 1,100 tonnes were set in the European waters of divisions II and IV, as recommended by the European Commission.

Other elasmobranches for which some kind of quota has been established are rays, under the generic name of *Rajidae* in European waters in divisions IIa and IV, which was increased by the Council of Ministers from the 2,802 tonnes proposed by the Commission to the 3,220 tonnes adopted, or the limit imposed by NAFO in division 3LNO of 8,500 tonnes. In contrast, no catch restrictions whatsoever were set for porbeagle or mackerel shark *(Lamna nasus),* which is completely inexplicable, or the basking shark *(Cetorhinus maximus)* whose fishing was prohibited only in European waters in sub-divisions IV, VI and VII, despite the fact that it is a species protected by numerous international conventions.

This total lack of criterion when it comes to setting quotas for elasmobranches demonstrates a profound inadequacy in the European Union and the urgent need to develop an Action Plan. On the one hand, for many years ICES has been calling for detailed, specific information on the species that are being targeted so they can draw up the most accurate possible assessments. The lack of reliable data, the application of generic quotas for "deep-sea sharks", and the failure to differentiate between species at landings runs contrary to the scientific criteria necessary for proper resource management.

We can be sure that invertebrates continue to be completely overlooked by fisheries management, despite their economic importance of their catches, and that only a few species of crustaceans are covered by TACs. Unfortunately, this is not the case of the deep-sea red crab, which is a species with no regulation. With regard to the exploitation of these crabs off the coast of Ireland, ICES has already warned that there are no international agreements on minimum sizes, levels of exploitation, quotas or catch methods. And it reiterated the importance of revising the management measures of this species due to the danger entailed in the expansion of this fishery and the low growth rate of these deep-sea species[29].

CONCLUSIONS AND PROPOSALS

Quota systems

The European Union has never had a proper TAC system (Total Allowable Catches), but rather its fisheries management has been based on an erroneous system of TALs (Total Allowable Landings) which has meant that scientific evaluations, authorised catches and landings have had no uniformity.

This huge inadequacy should be rectified in every fishery in order to avoid the imbalances between quotas and catches, to allow the better management of marine resources, to facilitate greater reliability in scientific assessment and to reduce wastage in fisheries to the absolute minimum.

All fisheries and fishing systems produce a certain percentage of accidental catches, some of which are discarded and some of which are commercialised. Discards are basically due to two reasons: the selection of catches or part of catches, or the elimination of unwanted species.

The current management systems do not take discards into account, although they should be included in TACs to be able to give more accurate catch figures.

The gillnet fishery in the North East Atlantic is an example of many of the errors in EU fisheries policies and management: they have allowed a new fishery to be started without having the necessary scientific and technical data for its proper management; there is no differentiation between the species caught; there is no control over the fishing effort, fishing grounds used, species caught, landings, etc.; they have allowed catches far higher than recommended; there are no specific regulations on the fishing gear used; it involves exceptionally high accidental catches, highgrading and discards, etc.

Along with a change in the current management formula to one based on a true TAC system, the EU should take action to reduce the level of accidental catches and eliminate discards. Later on, in order to have a better overview of the fisheries, catch agreements should include the impact of fishing gear on the environment and fishing stocks, and TACs should include species that are caught but manage to escape from the nets, which on many occasions are injured, and estimates on the impact of the fishery on the marine environment.

The TACs should not be seen as a measure that contradicts or opposes other measures but rather as the final numerical expression of ecosystematic management and the reduction and regulation of the fishing effort.

As a general rule, no new fishery should be authorised until the necessary studies have been carried out to demonstrate its viability. Likewise, the situation of existing fisheries needs to be analysed to determine in which of them this principle needs to be applied.

Target species

With the exhaustion of many pelagic or shallow-water stocks, many fisheries have had to deploy their nets further afield and at greater depths. In doing so, they have started catching

deep-sea species that are much more vulnerable than the species that were once traditional in European fisheries.

Various studies have demonstrated that deep-sea species can suffer sudden declines in very few years of exploitation, have a lesser ability to repopulate and recover, and are barely able to withstand commercial fishing. One of the most extreme cases is that of the orange roughy, for which catches that do not exceed 1%-2% of its virgin biomass have been recommended[30], but the situation is similar for many of these species, which, in general, it has been estimated cannot withstand catches exceeding 5% of their biomass[31].

In the case of the target species of these fisheries, the situation is as follows:

- Anglerfish

Some stocks are overexploited and despite continuous recommendations to reduce the fishing effort, the EU has not responded satisfactorily. Another problem is that two different species are caught under the name “anglerfish” which on many occasions are not differentiated either on catching or landing.

In any event, for reasons of ethics, economy and simple common sense, any fishery that produces up to 71% of discards in its target species should be halted immediately, even if the stock happens to be in a perfect condition.

The fact that there is different legislation, depending on the area in which the fishing gear is used, does not make regulating this resource an easy matter. There should be a unification of criteria for anglerfish exploitation, including the differentiation between *Lophius piscatorius* and *L. budegassa*.

The current mesh size does not allow proper selectivity, which means there is a high level of catches of juveniles. A revision of the relevant legislation could rectify this problem.

With regard to discards, no kind of highgrading or discarding of anglerfish should be permitted under any circumstances. Throwing parts of anglerfish overboard can only be permitted if there are conversion tables that enable analogies to be established between total catches and landings, in order to comply with a true TAC. Meanwhile, discarding catches because they are damaged is due to poor fisheries management and this should be banned. In many cases, a different policy of net deployment or *soak time* should be applied to solve this problem, which is explained further on.

In any event, even if the EU temporarily allows a transitional period that gives licence for parts of a species to be discarded (for example, anglerfish heads so that only the tails are commercialised), these practices should be eliminated in the future and no fishery should be authorised to waste any part of the species they catch. Landing should be obligatory so they can be used in other industries until a policy of total use of catches and zero discards can be achieved.

- Deep-sea sharks

The main problem in the fisheries management of sharks is the total lack of unified criteria and scientific information to allow rational management of this resource. In this case, the principle of

precaution should prevail over other decisions, preventing any fishery from being started up without sufficient technical basis.

The dramatic declines in certain populations should be more than sufficient reason to close down fisheries dedicated to catching deep-sea sharks. Only when proper information is available can catch rates, based on genuine TACs (as specified earlier) be permitted that take the vulnerability of these species into consideration. This could mean (and the Commission should take this on board) that quite possibly some of them may never be able to be opened to commercial fishing.

The EU is still lacking an International Plan of Action for sharks which it promised to implement with the United Nations through the FAO.

Special attention needs to be given to the catches of females, given that these are ovoviviparous species with long gestation periods. Nor should it be forgotten that until criteria of sustainability and fishing regulation can be established (i.e. minimum sizes), the fishery should be regarded as unregulated and thus illegal.

It is completely unacceptable that shark quotas are grouped under a general category that covers dozens of different species with very different biologies and needs.

As with the case of anglerfish tails, catches of sharks, depending on commercial trends, can be aimed at obtaining their livers, fins, fillets, skins or cartilage. Given that good fisheries management cannot be motivated by trends set by the market at any given time, the EU should not manage pieces but species.

All elasmobranches in which there are commercial interests should have a system of genuine TACs. As mentioned earlier, this might result in zero quotas for certain species where it is demonstrably impossible to establish sustainable exploitation. This measure should not only be applied to sharks but all species that are subject to exploitation. In contrast to what is currently the case, no species should be able to be caught unless there is due authorisation in place.

- Deep-sea red crab

As mentioned above, the vast majority of invertebrates subject to fisheries exploitation fall outside the basic management measures, which should be more than enough reason to halt the fisheries. This is the case of the deep-sea red crab as well as other crustacean fisheries such as all the Mediterranean ones, the red shrimp *(Aristeus attennatus)* and pink shrimp (*Parapenaeus longirostris)* in southern Portugal[32] and crustaceans from the *Crangon* and *Palaemon* genus in different parts of the North-East Atlantic, not forgetting the case of cephalopods such as *Loligo forbesi*[33].

In the case of the deep-sea red crab *(Chaceon affinis)*, we have the additional problem of its vulnerability as a deep-sea species.

This leads us to conclude that in accordance with the principle of precaution contained in the EU's Common Fisheries Policy, the Commission and member states should not allow new fisheries to be started if there is not sufficient scientific data to endorse their viability and good management. No species should be subject to exploitation without the necessary scientific studies and systems in place.

Accidental catches

The European Union is aware that its marine and fisheries legislation still contains many grey areas that need to be rectified. For example, the EU lacks effective regulations against accidental catches and discards.

Everyone has in mind the need to ensure that fisheries are increasingly clean, and so selectivity, in the spirit of gearing fishing activities towards a "zero wastage/discards" goal, is something that should be among the objectives of any good manager.

With its sights set on achieving this goal, the EU should put into practice policies geared towards progressively reducing accidental catches and discards. As an initial step, it should establish a maximum percentage of accidental catches, along with a total ban on discards and the adoption of a true TAC system as discussed earlier in this document. The provisional closure of a fishery could be implemented before its entire quota of accidental catches has been exceeded or if these have contained protected species or species for which a zero quota has been set.

We should not forget that some of the species caught accidentally by gillnet fisheries have been classified by ICES as exhausted or overexploited, which has called for the closure of direct fisheries of some of them and more controls over fisheries that may generate their accidental catches. This is the case of the blue ling (*Molva dypterigia*)[34].

The fishery

Gillnet fisheries in the North-East Atlantic have intrinsic problems that need be resolved as a matter of urgency and should serve as an experimental example for fisheries management in Europe.

The use of fixed gillnets at depths of over 200 metres has already been banned in the Macaronesian archipelagos of the Azores, Madeira and the Canary Islands[35]. There is thus already a precedent that could serve as a basis for the instrumentation of similar measures for the *rasco* fishery.

If these vessels had Spanish flags, the legislation would be much stricter: they would not be able to use nets of more than 11 kilometres (instead of the 300-400 kilometres currently deployed by each boat) and the mesh size would be 280 millimetres (instead of 160, 220 and 250 mm, depending on the area)[36]. Furthermore, it is incomprehensible that gillnets with mesh sizes of 160 mm are being used when, according to Council Regulation (EC) 850/98, these species should be included under "other species" and, therefore, mesh sizes of under 220 mm should not be allowed.

The lack of specific, uniform legislation that avoids legal loopholes could resolve a large number of the problems arising from this fishery, such as the length of time nets are deployed, the length of the fishing gear, the size of the mesh, their markings, the loss or ditching of fishing gear at sea, etc.

The large number and size of the nets used results in many of them being left unattended and they end up left in the sea for too long or being lost. A reduction in the size and number of nets

to dimensions that make them more easily manageable and recoverable would stop the loss of thousands of kilometres of nets a year in the NEAT.

Given that the European Commission has already acknowledged this worrying problem[37] and that there is plenty of information on the nets lost by fishing vessels, such as the report drawn up by the Institute for European Environmental Policy (IEEP) and Poseidon in this respect[38], we refer to their conclusions and our earlier comments.

The urgent need to solve the problems caused by this fishery is also driven by the need to adopt consistent measures before the fishery can expand to other areas, with similar impacts. Some of the vessels that have been involved in this fishery for the last few years have changed fishing grounds thanks to EU agreements with third countries or through leasing arrangements. In this way, catch zones have extended to the west of Africa and Brazilian waters, while the port of Las Palmas de Gran Canaria in the Canary Islands has joined the traditional landing ports of La Coruña and Vigo. Meanwhile, Spanish companies are also requesting permits to start an identical fishery in Argentina, aimed at catching anglerfish, deep-sea sharks and deep-sea red crab using *rasco* gillnets[39].

Meanwhile, the danger of illegal, unregulated and uncontrolled fishing (IUU) hangs over the *rasco* gillnet fisheries in the EU. At least five vessels that are or have been connected to this fishery have used flags of convenience from Belize, Panama and St. Kitts and Nevis in the last few years.

For many years now, the EU and other countries of the North-East Atlantic have relied on the scientific advice of ICES. Moreover, this institution has been quite quick on the uptake when it comes to incorporating new knowledge and social demands in fisheries management. It is therefore incomprehensible that European countries have turned a deaf ear to many of their evaluations and recommendations.

If we look at the case of anglerfish, on which data has been available for decades, we can see that the scientific recommendations on the stock between divisions VIIb-k and VIIIa and b have been ignored in seven of the last ten years, and that catches have even exceeded the TAC granted in the last three years[40]. In the case of the stock in VIIIc and IXa, not one single instance of ICES advice on quotas has been heeded since 1999[41].

In the case of the king crab and deep-sea sharks, although they have been studied for less time, experience and acquired knowledge and repeated warnings about the vulnerability of these species should have been sufficient for the EU to have adopted measures before allowing their depletion or collapse.

ANNEX I:
Vessels involved in the *rasco* gillnet fishery in the NEA in recent years

Name	Flag	Landing places	Companies	Observations
AR BAGEERGAN	UK (not in the last register)	Newlyn		PLN PZ287 Possibly scrapped Based in Newlyn
ARWYN	UK (not in the last register)	Coruña		IMO 6819623 Call sign GCFW PLN FH566 Based in Falmouth Arrested in UK Adelino Enriquez was the master. The former name was "Robrisa" then, very possibly owned by the dissolved company Robrisa Fishing Ltd., during the nineties.
ATALAYA	UK	Coruña	Elcon Leisure Ltd (owner)	IMO 7306570 PLN FH698 Call sign ZNJA6 Changed base from Newlyn to Falmouth
AYR DAWN	UK		Seascope Ltd. (owner)	IMO 6524022 Call sign GRXP PLN AR92 Based in Ayr Registered under the company Seascope ltd, London
BADMINTON	BELIZE	Vigo	Roda Norte S.L. (Shipping agency)	IMO 6909650 Call sign GZLS
BELEN	GER	Coruña	Cies Fischerei, GMBH (manager and owner)	IMO 8836041 Call sign DFPH PLN NC305 Arrested in Ireland Based in Cuxhaven Fishing in Brazil
BEN LOYAL	UK	Newlyn		Call sign MDDH PLN WK3 Received a grant of £9,380 from FIFG towards a £26,800 project. Seems to be one of the few real British boats. The Skipper's name is John Turtle
BLUE GATE	UK	Coruña	Machet, SA (Shipping agency), Sharp Office Ltd. (Owner)	IMO 7409205 Call sign MGJT9 Boat based in Brixham, but Sharp Office Limited is based in Madrid
BROSME	UK	Coruña and Vigo	Amberalter, Ltd. (owner and shipping agency)	IMO 7385368 Call sign GCRU PLN FH 680 The company Amberalter is based in Penryn, Cornwall but the City given by the owner as reference is Madrid, and the distributor of the catches is in La Coruña and his name is Isidro de la Cal Fresco, S.L. Based in Falmouth
CABO ORTEGAL	UK	Home not specified Spanish port		Call sign MVGM5 PLN AR865 Based in Ayr Arrested in Galicia and

				Ireland
CIBELES	UK (not in the last register)	Marín		IMO 8035958 call sign ZNIS4 The boat sank
CRYSTAL	UK	Coruña	Coruñesa de importación, S.L. (manager and shipping agency)	IMO 5064295 Call sign GHMF PLN M1082 Fishing in Brazil Ex-SEA HORSE
CURTIS	UK (not in the last register)	Home not specified Spanish port		IMO 5307556
EDER SANDS	UK	Coruña	Álvarez e Hijos S.A. (shipping agency) Ondar Eder, SA (old Owner) Ondar Fishing Company Ltd. (Owner)	IMO 7326051 Call sign GDNU The shipping agency has received 841.710,40 euros as subsidy by the local government. Arrested in UK and Ireland. Company based in Penryn, Cornwall, and with reference in London, but landing in Spain. Fishing in Brazil
GAZTELUTARRAK	UK (not in the last register)	Home port Coruña	Jose Luis Couceiro (Owner)	IMO 6925343 Call sign GFPL PLN FH539 Arrested many times in UK No longer working She was based in Falmouth
GLENELG	UK (not in the last register) Changed flag to St. Kitts & Nevis	Home port Coruña Landing in Las Palmas	Pastor Las Palmas, S.L. (Shipping agency)	Fishing in Brazil IMO 7205996
GREENWICH	UK	Coruña		IMO 5040421 Call sign GHRD PLN FH673 Based in Falmouth ExSWIFT, exBEN GLASSt
HERMANOS YANEZ	UK (not in the last register)	Home not specified Spanish port		PLN AR 870 Based in Ayr Arrested in UK
IDENA	UK	Coruña Las Palmas	Conmevina, S.L. (Shipping agency) Coruñesa de importación (manager)	IMO 7404803 Call sign GUXV In the last UK register she has a different name “SKUA” Fishing in Mauritania
JUNO	UK	Home port in Ondarroa	Flagperry Limited (Owner) Leased by Atummar Comércio e Ind. de Pesca Ltda.	IMO 7303700 Call sign GDHE PLN M567 Company based in Milford Haven but referred to Madrid Fishing in Brazil
LADY BEATRICE	GER (not in the last German register)	Coruña	Seamar GMBH (owner)	IMO 5364932 Call sign DEOJ Actually renamed as PESORSA CUATRO
LADY LAURA	UK (not in the last register)	Home not specified Spanish port	C-Maine Shipping (shipping agency)	PLN M622 Verify if she is now the LADY LAURA I IMO 6925628 from Honduras Or LADY LAURA I of Senegal IMO 9000098037
LEPHREETO	UK (not in the last register)	Home port in Coruña		IMO 5222500 Call sign GFPN PLN 401

				Arrested in Ireland Sank
MAR AZUL	UK	Coruña	Horpesmar (Shipping agency) Manuel Hortas S.A. (Owner)	IMO 7314682 Call sign MQSL8 PLN AR858 Based in Ayr Registered in UK under the company Benno Ltd
MAR BLANCO	UK	Coruña	Horpesmar (Shipping agency) Manuel Hortas S.A. (Owner)	IMO 8715730 Call sign MQMQ8 PLN AR857 Based in Ayr Registered in UK under the company Berga Ltd, London
MEEY	?	?	?	?
MENORCA	UK	Vigo	Francisco R. Rodriguez Srcs (Shipping agency) Menorca ltd (owner)	IMO 5170214 Call sign MEBG PLN AR777 Based in Ayr Always berth at Frigalsa Registered under the company Menorca ltd, London
MERIDIAN	UK (not in the last register)	Coruña		IMO 5040483 Call sign MQUD8 It is based in Falmouth with the PLN FH674
MONTE MAZANTEU	UK	Home port in Coruña		IMO 9014523 Call sign MRQT2 PLN AR862 Based in Ayr Arrested in UK in 2003
NORDSEE	GER	Vigo	Roda Norte S.L. (Shipping agency) Fandicosta (manager)	IMO 7424580 Call sign DFQG PLN HF570 Based in Hansestadt Hamburg
NORTE	UK	Coruña Las Palmas	Jose Antonio Arocha S.L. (shipping agency)	IMO 9000097977 Call sign VQDB5 PLN M1128
NORTH SEA COAST	UK Possibly changed to Panama	Coruña y Vigo		IMO 6829123 Cal sign MSGB8 PLN AR350 In the last UK register is under British flag Based in Ayr
PESORSA DOS	GER	Coruña	Seamar Gmbh. (owner)	IMO 7360930 Call sign DIFC PLN HF564 Based in Hansestadt Hamburg
PESORSA TRES	GER	Coruña	Seamar Gmbh. (owner)	IMO 7236103 Call sign DFPW PLN HF572 Based in Hansestadt Hamburg
PESORSA UNO	UK	Coruña	Seaway Ltd (Shipping agency)	IMO 7030614 Call sign GJCV The vessel was identified as the source of two diesel spillages in 2002 in Mildford Haven Arrested in Ireland and Galicia Witdrawn from the register?
PORT OF AYR	UK			IMO 7363138 Call sign MRNC8 PLN AR863 Spilled diesel while bunkering in 2002 in Milford Haven Based in Ayr

RODAS	GER	Vigo	Roda Norte S.L. (Shipping agency) Fandicosta (manager)	IMO 7420156 Call sign DFQF PLN NC327 Based in Cuxhaven
ROSELAND	UK Changed to France	Home not specified Spanish port	Tango Sas/Pronaval (Owner)	ex-PLN FH675 Ex-Call sign MRFW6 Now: Call sign FQZK PLN LR 924784
ROYALIST	UK	Coruña	Andrés Rey Parada y Otros (Shipping agency) Leased to Atummar Comércio e Ind. de Pesca Ltda. (owner)	IMO 5301459 Call sign GHFL PLN FD24 Fishing in Brazil
SERRANO HEVIA	UK (not in the last register)	Home not specified Spanish port	Sun Fisheries Ltd, Penryn (Owner)	IMO 6826042 PLN M1 Based in Milford Haven Arrested in UK
SOUTH COAST	UK (not in the last register) Changed flag to BELIZE	Home port in Ondarroa	Leased by Cooperativa dos Pescadores e Trabalhadores na Aquicultura do Litoral Paulista (Cooperpesca)	IMO 6719419 UK PLN was AR95 and call sign GXTA Arrested in Ireland. Based in Ayr Fishing in Brazil
SQUALO	UK	Coruña	Laidlow, Ltd (Shipping agency) Congelados Anter, S.L. (manager)	IMO 5407239 Call sign GFYV PLN TN99 In the last UK register still kept the old name “shark” Another old name was “Maria H”
SUFFOLK CHIEFTAIN	UK Changed to BELIZE	Coruña	Pescacariño, S.A. (Shipping agency -and manager) Seaflow ltd (owner) Leased by Cooperativa dos Pescadores e Trabalhadores na Aquicultura do Litoral Paulista (Cooperpesca)	IMO 6815304 Call sign GYMK PLN LT372 Arrested in Norway Last UK register still kept as British flag Fishing in Brazil Seaflow Limited is based in London
TAHUME	UK	Home not specified Spanish port		IMO 5128572 Call sign MYBP PLN FH666 Based in Falmouth Arrested in UK

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