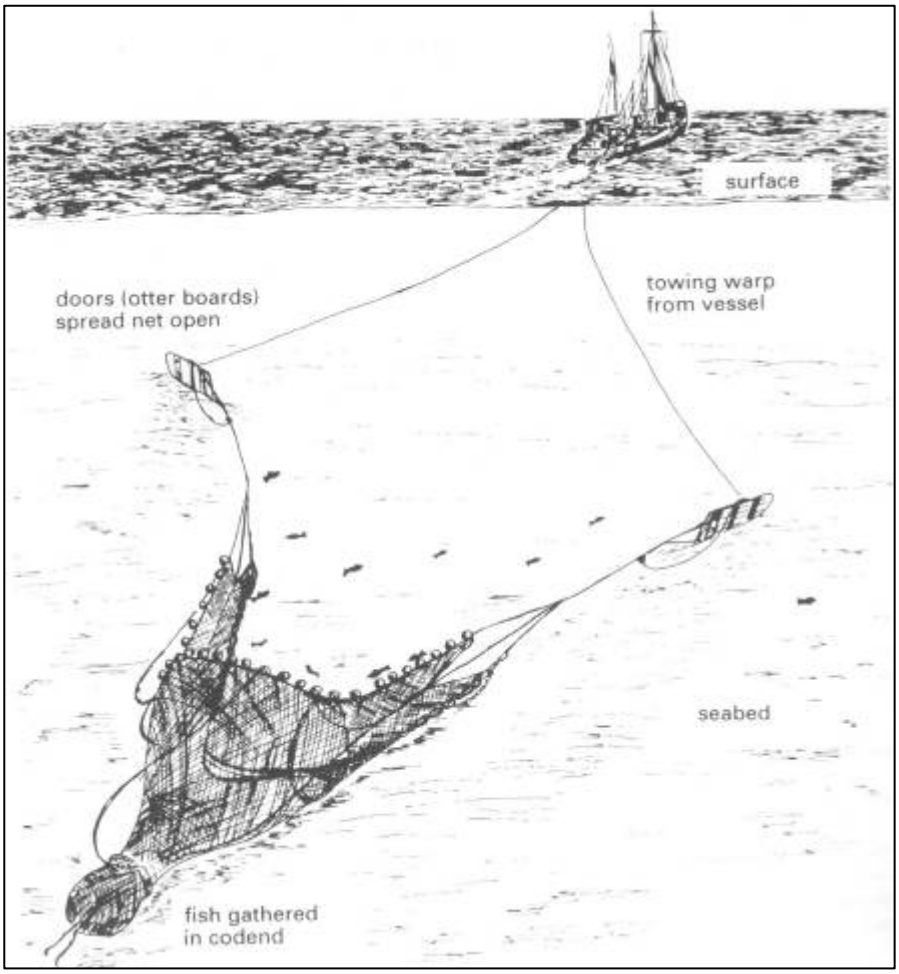
Marine Institute
Foras na Mara
Fisheries Ecosystems Advisory Services
Rinville, Oranmore, Galway.

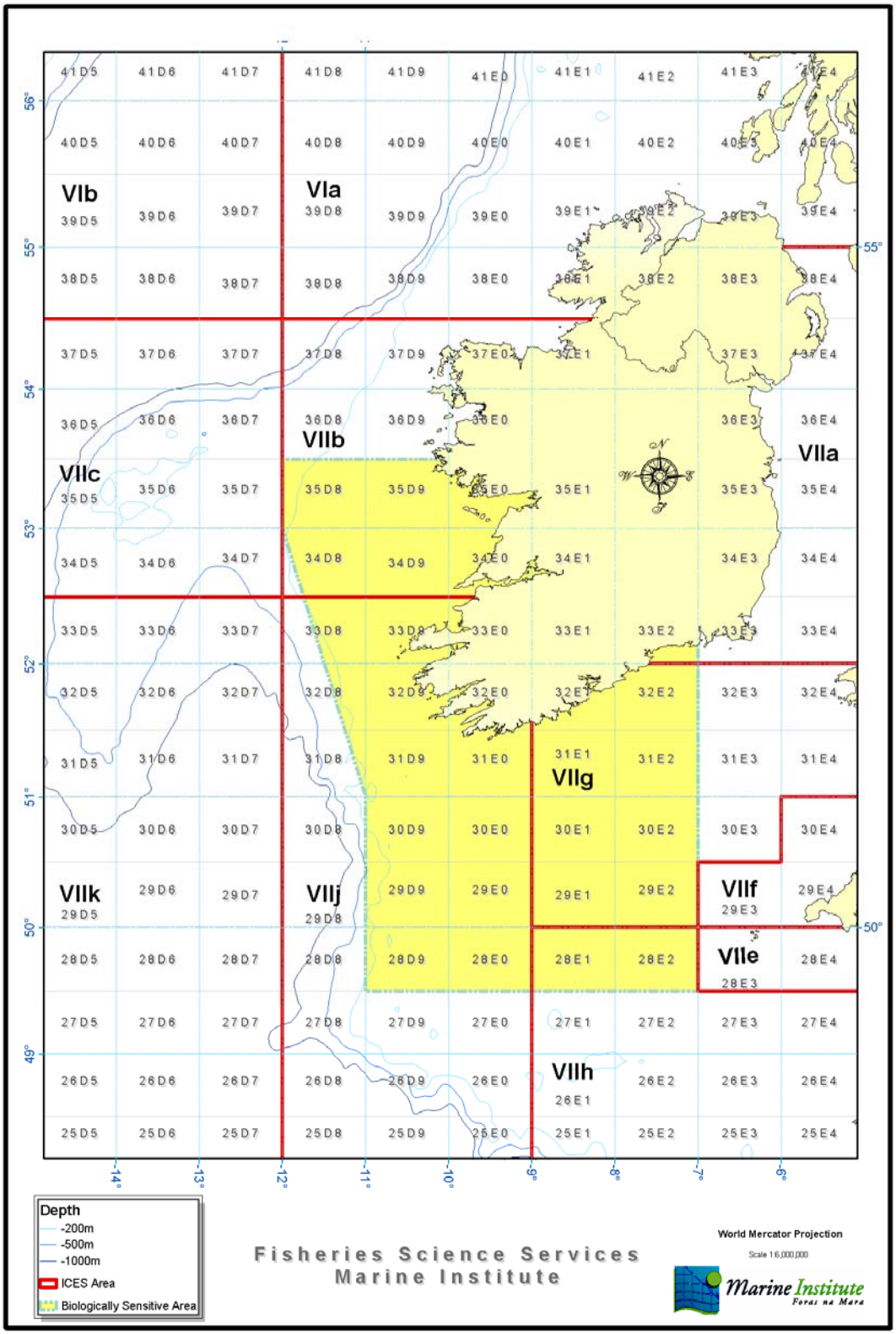
Catch Sampling Protocols



January 2017

Table of Contents

ICES FISHING DIVISIONS AROUND THE IRISH COAST



1.
INTRODUCTION

Within the Marine Institute, Fisheries Ecosystems Advisory Services (FEAS) assess, research and advise on the sustainable exploitation of the marine fisheries resource. Commercially exploited fish stocks in the waters around Ireland are managed by the EU under the Common Fisheries Policy (CFP). Stock assessments provide the scientific advice that is one of the cornerstones of the CFP. Data collection is the raw material for stock assessment and FEAS conduct an extensive data collection programme involving the sampling of landings at the ports, sea sampling for discards, analyses of Irish fleet activity (landings, gear used, areas fished, effort), research surveys on commercial and research vessels and laboratory based work on age estimation, egg and larval identification and histological work on fish reproduction.

These data are used in the national and international stock assessments that form the basis of the scientific advice on the status of the stocks. The international stock assessments are carried out at ICES (International Council for the Exploration of the Seas). The advice is used by the Irish Government, Industry and the European Union in the formulation of management policy for the fisheries resource. FEAS produce a 'Stock Book' each year (hardcopy, CD and web) which provides the key scientific advice for fish stocks of interest to Ireland and it is used by the Irish Government in fisheries negotiations with the EU.

FEAS also carry out an active research programme focused on improving the knowledge base for the main commercial fisheries. Research currently underway includes linking fish spawning with oceanographic features in the Celtic Sea and methods for assessing and providing advice for shark species. FEAS also supports fisheries research programmes carried out in many third level institutes and carries out an annual stock assessment course for post graduate students. There are several PhD students based with FEAS.

Landings of the various stocks are sampled at the ports, fishermen's Co-operatives, fish factories and auction sites around the coast, at sea and at the Dublin Fish Market. FEAS employ a series of contract port samplers who send information to FEAS on the length distributions of the landings. Surveys are undertaken on board chartered commercial vessels and the state research vessel *'MRV Celtic Voyager'* and on the '*MRV Celtic Explorer*' to gain information on the length composition and age of the stocks independently of the commercial fisheries. Research surveys also provide information on the distribution and abundance of fish stocks in the waters around Ireland. These surveys include Acoustic surveys, Ground fish surveys and tagging studies. FEAS also conducts a sea going catch sampling programme in order to monitor the level of discarding of juvenile fish in the various fisheries. All data are entered onto the various FEAS databases. Quarterly summaries of the data are produced annually and presented to the ICES Expert Groups. These data are then amalgamated with the quarter summaries produced by other countries exploiting the stocks and assessments are performed on the international data sets.

There are five main sections within FEAS: demersal, pelagic, inshore and deepwater and ecosystems:

Demersal Section

The demersal section assess, research and advise on commercial white-fish species such as cod, whiting, haddock, hake, angler (monk), megrim, plaice and sole in ICES Divisions VIIa (Irish sea), VIa (West of Scotland), VIb (Rockall), VIIb,c (West of Ireland), VIIj,k (Southwest of Ireland) and VIIg (Celtic sea). The demersal section receives length composition data on a monthly basis from port contract staff in the main ports of Greencastle, Killybegs, Ross a mhil, Castletownbere, Dingle, Dunmore East, Kilmore Quay, Howth and Clogherhead. FEAS staff also visits these ports every quarter to obtain age and length samples from the landings.

Demersal data are sent annually to the ICES Expert Groups. The demersal section are currently ICES co-ordinators for cod and whiting in VIIa, Whiting in VIIe-k and stocks of cod, whiting, plaice and sole in ICES Divisions VIIb,c and VIIj,k. Each ICES co-ordinator compiles the international data for a stock and performs the annual assessment of the stock. FEAS also conducts a deep water research programme aimed at providing the basic biological information necessary to manage this new fishery.

Within the demersal section a dedicated shellfisheries team assess, research and advise on the important *Nephrops* fisheries around the coast, particularly in the Irish Sea, the south coast, the Aran Islands and off the Porcupine Bank. Ageing of *Nephrops* is not possible by the traditional means and FEAS is developing improved methods of age determination using computer programmes designed to separate length distribution data into age groups. FEAS contributes to the ICES Expert Group on the assessment of *Nephrops*. In 2002 FEAS conducted the first Irish Underwater T.V. survey on the prawn grounds off Aran, Galway Bay and Slyne Head. This survey was used to estimate *Nephrops* stock size from burrow densities. A map of the Functional Units used in the management of *Nephrops* stocks is shown in Appendix 9.

Pelagic Section

The main pelagic fisheries which the Irish fleets exploit are the herring fishery in the Celtic Sea and Southwest of Ireland, the herring fishery off the West and Northwest of Ireland, the mackerel fishery which extends along the West of Scotland and Ireland, the North sea and the Horse mackerel fishery which mainly takes place off the Northwest coast of Ireland and the tuna fishery off the Southwest coast of Ireland.

The data collection programme conducted by FEAS includes sampling of catches for length, weight, age, sex, maturity and vertebral counts, all of which were designed to provide necessary information for stock assessments. Herring acoustic surveys take place in the Celtic Sea and off the West and Southwest coasts, and egg and larval surveys for mackerel and horse mackerel, in order to obtain estimates of the size of the stocks in these areas. Pelagic scientists also go to sea aboard commercial fishing vessels to observe Horse mackerel and tuna fishing operations around the Irish coast. FEAS makes annual contributions to the ICES Expert Groups on herring, mackerel and Horse mackerel. The pelagic section also provide advice to various local pelagic management committees.

Inshore Fisheries Section

FEAS carries out an extensive sampling programme for amongst others, brown and spider crabs, razor clams, bass, whelks and other bivalve species. Surveys are also carried out annually and included work on bass in Wexford harbour, Ballymacoda and the Blackwater river. Crab tagging has been carried out in Wexford harbour, along with spider crab surveys in Brandon and Tralee bays. Bivalve surveys were also carried out in Gormanstown, Blacksod and Kilkieran Bays, Clifden, Clarinbridge and the Irish Sea.

Deepwater and Ecosystem Section

The deepwater and ecosystem section works on the ecology, assessment and advice of deepwater fisheries around Ireland. Irish deepwater fisheries have rapidly expanded in the early part of this decade with catches peaking in 2002/2003, but the high exploitation rates have resulted in the deepwater stocks being now severely depleted. Low stock sizes have led to a strong decline in the deepwater fisheries in the last years. The FEAS deepwater survey programme examines the abundance and biology of commercial and non commercial deepwater species and studies the environment that they live in with a multidisciplinary approach. Comparison with historical survey is also made to examine the impact of fishing on the deepwater ecosystem. In addition to the deepwater work, the ecosystem group looks at how fish stocks interact with their environment and how these interactions can be incorporated into their management.

FISHING AREAS

Figure 1.1 gives a rough picture of the main fishing ports and fishing grounds around the Irish coast however, by no means all of the fishing grounds are included in this map.

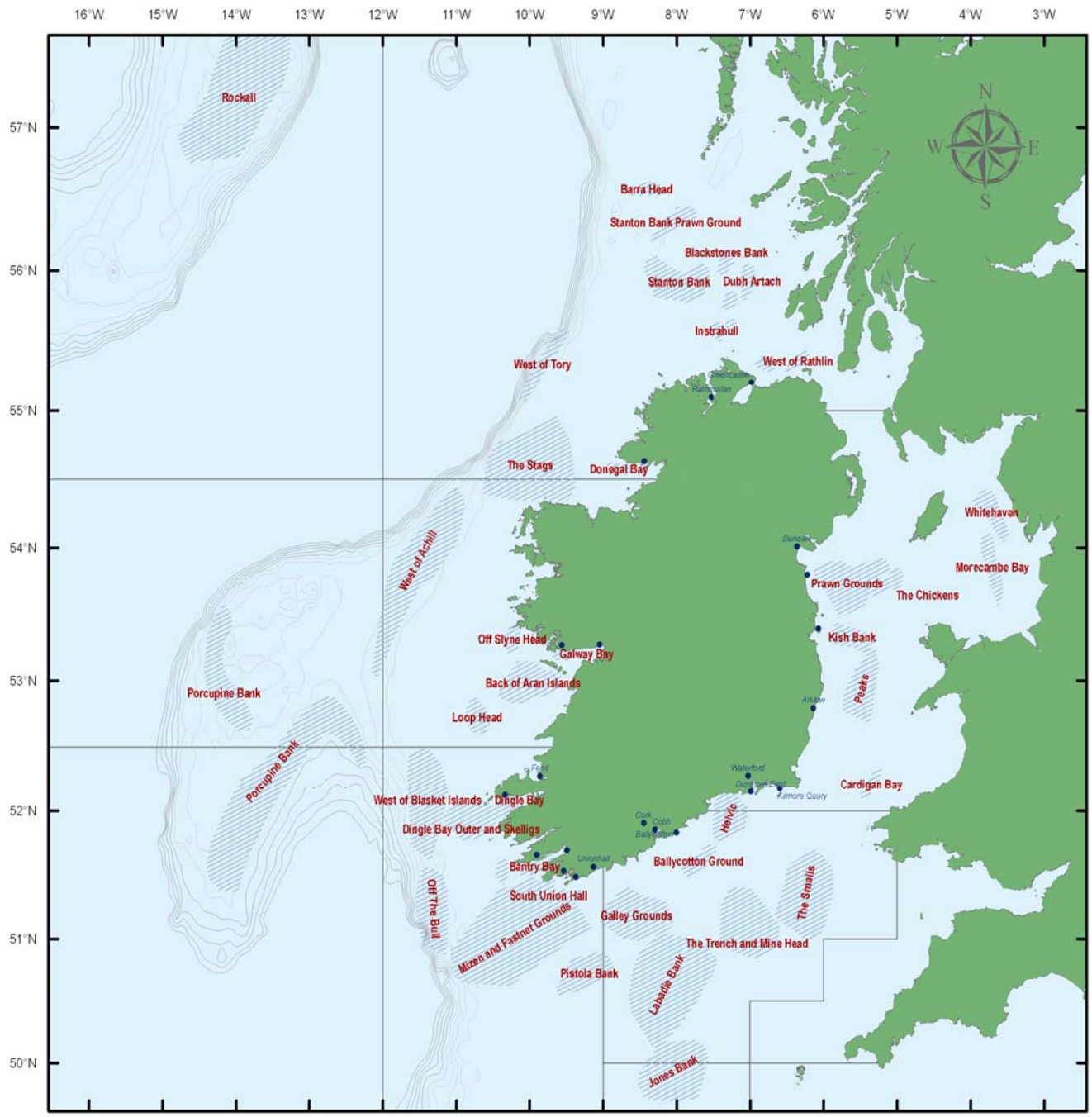


Figure 1.1 Fishing Grounds and catch sampling tows

2.

CATCH SAMPLING PROTOCOLS

TARGET SAMPLING LEVELS

Currently catch sampling in the Marine Institute is based on the metier approach. A metier is defined as a homogeneous subdivision of a fishery by vessel type (e.g. the Irish monk and megrim -directed otter trawl fishery by vessels in the VIIb,c,j,k). The metiers have been defined with regards to the Data Collection Framework (199/2008) regulation and are based on landings percentage composition. The Metiers to be sampled are given in Table 2.1.

Table 2.1 The Metiers currently monitored by the FATs.

ICES Area	Gear	Species	Description
VIIa	Boat Dredge	Molluscs	Fisheries for clam, cockle, scallop (with VIIfgh)
VIIfgh	Boat Dredge	Molluscs	Fisheries for clam, cockle, scallop (with VIIa)
VI	Pots and Traps	Crustaceans	VIa inshore fisheries for Pink shrimp, Brown crab, Brown crab and lobster, Lobster
VIIa	Pots and Traps	Crustaceans	Inshore fisheries for Brown crab and lobster, Lobster, Velvet crab
VIIbcjk	Pots and Traps	Crustaceans	Inshore VIIb and VIIj fisheries for Pink shrimp, Brown crab and lobster, Lobster, Spider crab, Velvet crab
VIIfgh	Pots and Traps	Crustaceans	Inshore VIIf and VIIg fisheries for Pink shrimp, Brown crab and lobster, Lobster, Spider crab, Velvet crab
VIIa	Set Gillnet	Demersal Fish	Quarter 1 Cod Fishery mainly
VIIfgh	Set Gillnet	Demersal Fish	Targeting mixed whitefish in VIIg, part of a trans boundary fishery with VIIa
VIIbcjk	Set Gillnet	Demersal Fish	Targeting Hake
VIIa	Bottom Otter Trawl	Crustaceans	*Nephrops* fishery on the western Irish Sea
VIIbcjk	Bottom Otter Trawl	Crustaceans	*Nephrops* fisheries on the Aran grounds and Porcupine bank
VIIfgh	Bottom Otter Trawl	Crustaceans	*Nephrops* fishery on the Smalls ground
VI	Bottom Otter Trawl	Demersal Fish	Targeting hake, monkfish, megrim, haddock with by catches of whiting, Nephrops and cod
VIIa	Bottom Otter Trawl	Demersal Fish	Mixed whitefish fishery with VIIg
VIIfgh	Bottom Otter Trawl	Demersal Fish	Targeting haddock, whiting, hake and cod with by-catches of anglerfish, megrim and other demersal species
VIIbcjk	Bottom Otter Trawl	Demersal Fish	Hake, monkfish and megrim slope based fisheries
VIIbcjk	Pelagic Pair Trawl	Large Pelagic Fish	VIIj and VIIk Tuna fishery
VIIIabde	Pelagic Pair Trawl	Large Pelagic Fish	VIIIabde Tuna fishery
VI	Pelagic Pair Trawl	Small Pelagic Fish	VIa herring, VIa part of wider fisheries for mackerel, scad, sprat, VI blue whiting part of the wider fishery
VIIbcjk	Pelagic Pair Trawl	Small Pelagic Fish	PTM for blue whiting
VIIfgh	Pelagic Pair Trawl	Small Pelagic Fish	Part of wider fisheries. VIIg fisheries for herring, sprat, VIIh fisheries for mackerel, scad
VIIIabde	Pelagic Pair Trawl	Small Pelagic Fish	Bay of Biscay mackerel fishery
IV,VIId	Pelagic Pair Trawl	Small Pelagic Fish	Mackerel fishery
VIIa	Pelagic Pair Trawl	Small Pelagic Fish	Herring fishery
I,II	Pelagic Pair Trawl	Small Pelagic Fish	Atlanto-Scandian Herring fishery
IV,VIId	Pelagic Pair Trawl	Small Pelagic Fish	Primarily IVa Mackerel fishery
VIIa	Fly Shooting Seine	Demersal Fish	Targeting VIIa roundfish (haddock, whiting , cod and hake) fishery
VIIbcjk	Fly Shooting Seine	Demersal Fish	Targeting VIIb,c,j,k roundfish (haddock, whiting , cod and hake) fishery
VIIfgh	Fly Shooting Seine	Demersal Fish	Targeting VIIg roundfish (haddock, whiting , cod and hake) fishery
VIIa	Beam Trawl	Demersal Fish	Targeting Sole or Rays with by-catches of plaice and other demersal species
VIIbcjk	Beam Trawl	Demersal Fish	Targeting megrim and anglerfish with by-catches of sole, plaice, rays and other demersal species.
VIIfgh	Beam Trawl	Demersal Fish	Targeting megrim and anglerfish with by-catches of sole, plaice, rays and other demersal species.

STANARD OPERATING PROCEDURES FOR DEMERSAL TRIP

1. **PRIOR TO DISEMBARKATION:**
   - The FAT/Contractor should inform FEAS/Catch Sampling Co-ordinator the date and time of departure and predicted date and time of return, aswell as the vessel details. A text should be sent to 0044 7797801718 with the following Vessel Name/Departure Port/Fishing Grounds/ /estimated number of days at sea E.G.

     Voyager/Castletownbere/West Achill/5

     RETURN is typed to this number once the person is ashore
   - Check that all equipment is ready and organised.
2. **ONCE ABOARD:**
   - The FAT should familiarise himself with the operations of the ship. The main priority at sea is data collection, which begins as soon as the first haul is deployed.
   - All data pertaining to the Haul is collected and recorded on the **HAUL SHEET**. Double check the mesh size for each haul with the skipper as mesh size can change during the trip.
   - Any Bird/Mammal/Reptile/Decomposed organism that comes in contact with the gear during fishing operation either collected on deck or falling out during hauling can also be recorded on the **HAUL SHEET** If one of these is observed and "YES" is selected in the Bird/Cetacean/Reptile or Decomposed Carcass field the specific details must be filled overleaf on the **HAUL SHEET.**
   - Once the haul has been completed and is being lowered into the hopper/pound, an estimation of the bulk catch must be obtained. This is done either by the skipper or the FAT depending on the level of experience. The bulk catch is usually estimated in 40 kg box equivalents. As this is just an estimate it is important to get this information as accurate as possible. Always show the estimate of the bulk catch to the skipper so he is in agreement.
   - The discards should now be sampled.
3. **DISCARD SAMPLING**
   - Obtain a random box (40kg) of discards from the sorting pound or the conveyor belt. This can be set aside for later when the landings have been measured. The length composition of all species present should be recorded **(MEASURED ONLY SHEET).** Record **"D"** for Discards on the sheet. Ensure at all times that the discard sample is representative of the discards taken in the catch. Fill the box to 9 inches in height (a 12 inch ruler can be used). Measure the fish discards and record. Demersal species are measured to the nearest cm below and pelagic (sprat, herring) and boarfish to the nearest half cm below. Grenadiers should be measured to the pre-anal fin length. Rabbit fish to the pre supra caudal fin length. Smoothheads should be measured to the Standard length. Sex is recorded for all elasmobranchs, (rays, skates and sharks) and megrim. See Appendices for further information. If unsure about species identification, freeze sample and bring back to MI for further clarification.

- When all of the fish discards have been measured the box will contain all of the non-fish discards (NFD). Estimate the non-fish discards content of the box by measuring the height of the remaining contents and converting into the percentage of the box taken up by non-fish discards.

  Non-fish discards are defined as seaweed, dead shells, stones, crabs, jelly fish, squid and rubbish. Discarded small prawns are also included as Non-fish discards. Record the percentage of and the breakdown of the NFD on the **(MEASURED ONLY SHEET) eg 40%, 10%.**

  Sand / muck in discard sample is not to be included in the non fish discards. This is usually not a problem but on, for example, a beam trawl trip, the bulk catch is estimated by the skipper on the basis of what the nets look like when they are hauled aboard. State in the comments section the amount of the bulk that sand / muck makes up. The composition of non-fish discards and the proportion of non-fish discards is recorded for every haul.

- Sometimes all the fish for a particular species might be measured if the volume of those species discarded are low and there is time to measure all of them. If this is the case, then please tick the following box on the **MEASURED ONLY SHEET.**

Have you measured all the fish of a particular species for this haul ?	

- In order to collect information on the age and weight of the undersized commercially discarded species, a selection of five individuals per 1cm length group, per species is made per ICES Division, gear type and quarter. These fish are stored in 40 kg boxes for later examination in the port laboratories. Species to be aged are cod, whiting, haddock, plaice, black sole, megrim, *L. budegassa*, and *L. piscatorius*. A tally of this information is recorded on the **QUARTERLY OTOLITH TALLY SHEET**-. These fish are aged back at MI HQ and the fish details are recorded on the **AGED DATA SHEETS**. This fish can be collected from your random box of discards or from the entire haul.

- **Sampling in Context of the Landing Obligation**

In 2016 the landing obligation comes into effect this is a short note on how to handle this within the sampling programme.

Conveyor Belt System

Collect the discards as normal. The crew may pick out the species subject to the LO before they come to the discard box, ask them to leave a few on the belt and collect them in the discard box. Measure the discard box as normal and return LO fish to the crew.

Pound System.

Collect the discards boxes as normal. Measure box as normal. If there are LO fish in the discard box give them back to the crew.

4. LANDINGS SAMPLING

- For every haul where discards are measured, landings should be measured. Measure and record landings samples on the **MEASURED ONLY SHEET.** Record **"L"** for Landings on the sheet**.** It is important to sample discards and landings of the same species from the **same** haul. They must be sampled representatively. All species recorded as being measured from a particular haul must be for that haul only.

- Ensure that species measured for landings for a particular haul are also present in the retained catch tally sheet for that haul.
- **All** species landed must be sampled at some stage during the trip. This includes not only target species but also other species that are landed. This includes squid, measured to the mantle length and *Nephrops* measured to the carapace length. If these species have been landed over a number of hauls then please enter them on a separate **MEASURED ONLY SHEET** sheet using Haul 300 as the haul number.

5. RETAINED CATCH TALLY

- Record the commercial landings tally on the **RETAINED CATCH TALLY SHEET.** This information is usually obtained from the skipper or one of the deckhands responsible for keeping account of what was landed. A conversion factor must be applied for fish that have been gutted (see REFERENCE TABLES). Ensure that the correct conversion factors for gutted to round landings is used. Once the total landings sum has been obtained, record it in the **Total Landings** box of the **HAUL SHEET**. Check for negative discards at this point. See Notes on Discard sampling for explanation of negative discards.
- Make sure even half or partially filled boxes are recorded as part of the haul that they were caught in and not all lumped together at the end of the trip.
- Show skipper retained catch tally sheet for every haul so he is in agreement.

NOTE:

Haul details, Bulk Catch and Retained Catch tally is recorded for every haul regardless of whether fish have been measured.

6. ON RETURN TO PORT

- Type RETURN to 0044 7797801718
- At the end of each trip, the **CRUISE REPORT** form must be completed.
- Once all the data sheets have been completed the data can be entered onto the FATS Discard Database as outlined in the Discard Database Manual (not applicable to contractors).
- A **readable** copy of the data sheets should be made and sent to the Catch Sampling Co-ordinator.
- **Data Quality** is paramount, please ensure legibility, correct species names, correct measurements, that all data has been recorded and no blanks are left on data sheets. Check units of Quantity are uniform across and within hauls.
- As outlined in the Discard Database Manual all excel files should be outputted and sent to the Discard Database administrator (not applicable to contractors).

NOTE: on Weights of Boxes and Baskets

Please note that the weight of a box or basket of fish varies depending on the type and also on the species in the box. If BOX is recorded as the unit of measurement then it is automatically assumed that **1 BOX=40Kg**. If this is not the case for the box and or baskets that are used on board then use KG instead as the unit of measurement.

STANARD OPERATING PROCEDURES FOR *NEPHROPS* TRIP

Steps 1, 2, 4-6 should be followed as outlined in Demersal Sampling SOP above. The major difference in this protocol is with respect to the one box discard sample and whether or not there are *Nephrops* heads present in the one box sample. If there are no heads present then proceed with Step 3 as described above. If there are heads then use the following procedure.

i) Take out heads from 1 box sample

ii) Estimate sample size left i.e. 0.85 of a box- Please note that the bulk on a Prawn Box is usually (28kg). In this case the sample is now 0.85*28kg =23.8Kg . Please enter this value in the Quantity box.

iii) Measure all fish.

iv) Give as accurate an estimate as possible of the volume occupied by NFD of the 0.85 box sample. Write in this % NFD on the measured only sheet.

As for the SOP above, record the breakdown of NFD which will more than likely included small unmarketable prawns. NFD can range between 30-90% on a *Nephrops* directed trip.

v) Write **23.8** in Quantity section in the measured only sheet and **Kg** in as Units.

See Example Below

(4 & 5) MEASURED ONLY SHEET									Page No.
CRUISE CODE			Haul No.					Grade	
Quantity*	23.8	Units	Kg	Presentation	R	Type	D	% NFD	70

Bulk on *Nephrops* trip

The bulk catch on a *Nephrops* trip is estimated in kg. The weight of a box of bulk on a *Nephrops* trip is estimated to be on average 28kg.

Therefore the weight of the bulk (kg) = 28kg*No. of Boxes

If baskets are used then it is 22kg per basket of bulk.

Landings of *Nephrops* :

The weight of a box of whole prawns is estimated to be on average 18Kg.

The weight of a box of tailed prawns is estimated to be on average 23Kg.

If the landings is sent down to the hold in baskets it is usually then put into boxes and iced below. If so get the tally of boxes and multiply by the box weights for whole prawns/tails.

Whether baskets or boxes are being used they need to be converted to Kilos.

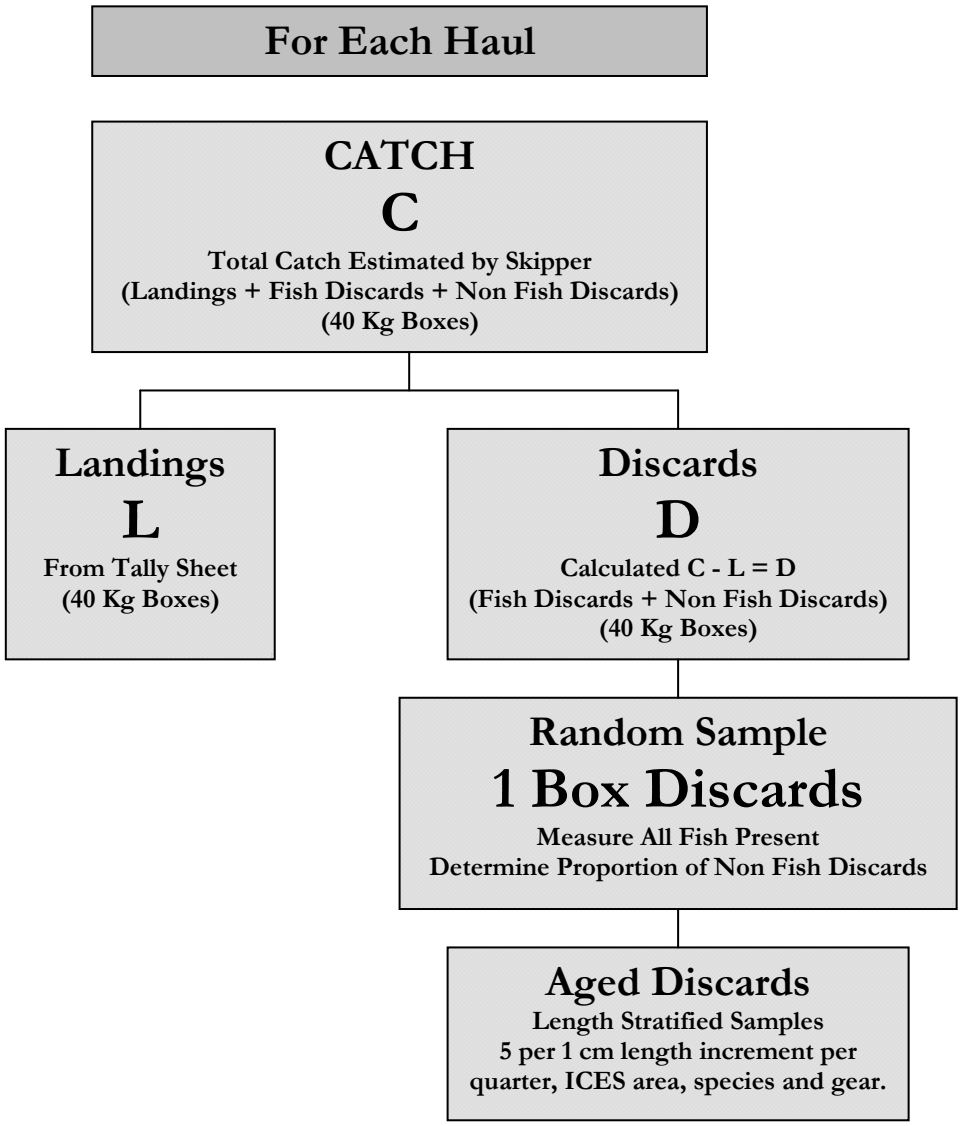
If either of the weights above are not appropriate then estimate the number of kilos of each box/basket of whole /tailed prawns according to the type of box/basket being used by that vessel.

Weigh the baskets or boxes if needed.

STANARD OPERATING PROCEDURES FOR A SET-NET TRIP

See Appendices for detailed SET-Net sampling protocols.

Figure 2.1: Present FEAS Catch Sampling Protocol



NOTES ON DISCARD SAMPLING

- On board the vessel, vary sampling throughout the duration of the trip and times of day. Be intuitive to changes aboard the vessel and adopt a sampling strategy to reflect any changes, i.e. moving ICES divisions, changing of gear etc.
- Always take one box of discards unless the discarded fish are very small and would take too much time to measure. If there are lots of tiny fish in a sample take a smaller quantity e.g. 0.25, 0.33, 0.5 of a box. Record the quantity sampled on the **MEASURED ONLY SHEET**. The only reason why we ask you to take one box if possible is to keep the raising factors at a reasonable level.
- If 'slipping' occurs please record in the comment box of the landings tally sheet the amount slipped by haul. If this is an estimated figure please give an indication of the degree of accuracy of the data.
- **NEGATIVE DISCARDS**

  The bulk catch is usually estimated by the skipper and the landings are obtained from the landings tally sheet raised to whole fish using the appropriate conversion factors. If either the bulk estimate or the total landings are inaccurate this can result in a negative discard value for the haul. All of the data collected for that haul would be considered unreliable, would be marked as a foul haul and therefore not used in any analysis of discard rates. It is essential to check that the total landings raised to whole fish and the proportion of non-fish discards are not greater than the skippers estimate of bulk catch. Negative discards can occur because:

  a) the bulk catch has been underestimated by the skipper (this can be detected immediately and hopefully rectified if the FAT is calculating the 'gutted to round' after each haul and making sure the total figure is smaller than the 'bulk catch' figure).

  If there are negative discards enter **2** in the Success code field of the **HAUL SHEET.**
- **FOUL HAULS**

  If a foul haul occurs a discard sample should not be taken as this is not representative of a typical haul from the trip.

GENERAL CRITERIA FOR CHOOSING SAMPLING TRIPS

- More shorter trips are more efficient than few long ones.
- Better to have more trips than more hauls within a trip
- Better to have more vessels than more trips on the same vessel- better not to repeat vessels
- From 2017 it is mandatory (Commission Implementing Decision (EU) 2016/1701) to record the response from the skipper after you have asked him to carry out a catch sampling trip on-board his vessel. From a statistically sound sampling point of view refusal rates are a necessary part of the data collection as without it you cannot calculate a measure of variance and you have no way of assessing bias, (SGPIDS ,2013). Many other ICES MS have been recording refusal rates in their schemes for the last number of years.

WHAT TO DO?

WHEN AND WHERE?

HAUL SHEETS can be kept in **wheelhouse** as this is where you will be recoding most details on the haul sheet

Doors go into water- **shoot details**, lat,long, time,depth etc

During Haul-**environmental info, ices division, mesh, gear, fishing ground**

Doors come out, **Haul details**, lat, long, time, depth

Cod end about to be dropped into hopper- estimate **bulk catch** or ask skipper. Skipper should be shown estimate of bulk catch for every haul

Record any by-catch

Go to Fish deck with **MEASURED ONLY SHEETS**

Crew will be sorting catch. Take random box of discards. See protocols. Set box aside.

Choose species to measure for landings (retained catch), representative and also probably in discard sample.

Start measuring fish.

If needed, take some fish for discards aged sample (undersized fish).

Get tally of retained catch from either skipper or crew man. Record on **RETAINED CATCH TALLY SHEET**. Skipper should be shown retained catch tally after every haul. Fill in total of retained catch tally (**Total Landings)** on haul sheet. Check for negative discards.

Fill out **discards sampled** and **Landings sampled** box on **HAUL SHEET**

Record **Success Code**.

At end of trip, fill out **DISCARD CRUISE REPORT**.

These are general guidelines. Note all boxes on datasheets need to be filled in for every haul.

SAMPLING FORMS

The sampling forms are given in Appendix I and are also available on Galwayfs01:\Discards\FAT FORMS\Demersal-Nephrops data sheets\FATFORMSv2.xls. Table 2.4 contains a complete description of the forms used for discard data collection.

Table 2.4 The catch data collection forms.

Data sheet	Variable name	Definition	Codes	Comments
Discard Cruise report				This form must be completed after each trip and sent to FEAS immediately on return to port.
	SAMPLER	Sampler full name		
	Cruise code	Unique cruise ID	FAT/ 3-digit primary port code/ Year e.g. 95/ Trip no.	See port codes. For Trip no. start at 1 at beginning of year.
	Vessel	LOA and Kw	N/A	overall Length and Kilowatts
	Ports	Departure and Arrival Ports port of trip	See port codes.	N/A
	Gear	Type of gear used	N/A	For reference only, not entered onto database
	Dates	Departure and Arrival dates	N/A	N/A
	ICES Division	Main ICES Divisions of fishing activity	See list of ICES divisions	For reference only, not entered onto database
	Times	Departure and Arrival Times	N/A	N/A
	Fishing grounds-Common name	Get this only from the skipper. If there is no local name for the area fished then leave blank.	See Fishing Grounds List	N/A
	Average Duration of Tows	Average tow duration	N/A	N/A
	General Weather Conditions	General Weather Conditions eg winds and sea state	N/A	N/A
	Gear Damage	Any gear damage		
	Additional Information	Any relevant information,		
	Landings Composition	Main Species and Presentation	See species list codes	For reference only, not entered onto database
	Fish Discard Composition	Main Species	See species list codes	For reference only, not entered onto database
	Non-fish Discard Policy	Main Species		
	Discard Policy	Main Discard Policy on board		
	Total number of hauls	Total number of hauls made during the trip	N/A	N/A
	Number of hauls sampled	Total number of hauls sampled during the trip	N/A	N/A
	Boxes of Discards	Total number of boxes of discards brought back from discard trip		
	Tick Boxes for Species Aged	Keeps track of otoliths collected		

Data sheet	Variable name	Definition	Codes	Comments
	Discard Cruise Report	Number of Discard Cruise Report Sheets		
	Haul Sheets	Number of Haul Sheets		
	Aged Discard Sheets	Number of Aged Discard Sheets		
	Commercial Landings Tally Sheets	Number of Commercial Landings Tally Sheets		
	Measured Only Sheets	Number of Measured Only Sheets		
	Comments	General Information		
Haul sheet	Cruise code	Unique cruise ID	FAT/ Primary port code/ Year/ Trip no.	See port codes.
	Haul number		N/A	Start at 1 for each trip. Try to collect landings tally data for all hauls regardless of whether sampled or not.
	Gear code	Type of gear used	See Gear codes	The list of gear codes is not complete at present. Note any further observations on gears used in comment box.
	Mesh size	Cod end mesh size in mm		Sensitive information so be diplomatic. ALWAYS CHECK with skipper.
	Success code	This code identifies the success of the haul in terms of whether there were landings and whether data were collected	See success codes	N/A
	ICES division		See list of ICES divisions	N/A
	Time shot	Time is recorded from when the doors enter the water	24-hour clock	N/A
	Depth shot	Depth is recorded from when the doors enter the water	In metres, see conversion table	N/A
	Lat. shot	Positions are recorded from where the doors enter the water	Format= 99o99.99	N/A
	Long shot	Positions are recorded from where the doors enter the water	Format = 99o99.99	N/A
	Shoot date		N/A	N/A
	Depth hauled	Depth is recorded from where the doors exit the water	In metres, see conversion table	N/A
	Lat. hauled	Positions are recorded from where the doors exit the water	Format = 9o99.99	N/A
	Long hauled	Positions are recorded from where the doors exit the water	Format = 9o99.99	N/A
	Haul date		N/A	N/A

Data sheet	Variable name	Definition	Codes	Comments
	By-Catch Information	Bird, mammal, reptile, decomposed species		Use Overleaf on haul sheet to further record information on by-catch
	Sea state and swell	N/A	See Sea state and sea swell reference list	N/A
	Wind Direction and Force	N/A	See Sea state and sea swell reference list	N/A
	Ground type	N/A	See Ground type reference list	N/A
	Bulk catch	N/A	N/A	Give units
	Total landings	N/A	N/A	Give units
	Discards sampled	N/A	N/A	Give units
	Landings sampled	N/A	N/A	Give units
Retained Catch Tally sheet	Cruise code	Unique cruise ID	FAT/ Primary port code/ Year/ Trip no.	See port codes.
	Units	Units of measurement	N/A	Tick box
	Species	N/A	See species reference list	
	Grade	Fish Market Grade	Small, Medium or Large	See Datasheet for further information
	Condition	Gutted, Round etc	See reference list	
	CF	Factor for raising weight from gutted to round as necessary	See species conversion factor reference list	This variable must be entered each time
	Qty	No. of units of species landed	N/A	N/A
	Total	Total live weight landed per species	N/A	N/A
	Total Landings	Total live weight per haul		
	Cruise code	Unique cruise ID	FAT/ Primary port code/ Year/ Trip no.	See port codes.
Measured only sheet	Cruise code	Unique cruise ID	FAT/ Primary port code/ Year/ Trip no.	See port codes.
	Haul number	N/A	N/A	As before
	Quantity	Quantity of units in sample, always >=1	N/A	N/A
	Units	N/A	N/A	N/A
	Presentation	Gutted or round	N/A	N/A
	Type	Landings or discards	N/A	N/A
	% NFD	% of non-fish discards observed in sample box	Format = 9.9	N/A
	Breakdown of Non-fish discards	General make-up of non-fish discards e.g. Seaweed, Sea Urchins etc.	N/A	Not entered onto database at present
Aged discards sheet	Cruise code	Unique cruise ID	FAT/ Primary port code/ Year/ Trip no.	See port codes.
	Check list	N/A	N/A	A check list to ensure sufficient sampling for age in each length group by species, gear and quarter
	Fresh, Iced, Frozen	N/A	N/A	Tick as appropriate
	Species	N/A	N/A	N/A
	Sampled By	Sampler full name		
	Sampling Place			
	Age Reader	Age Reader full name		
	Index No.	Helps in age reading		
	Len	N/A	N/A	N/A
	Wt	N/A	N/A	N/A
	Age	N/A	N/A	Not entered onto database at present

Data sheet	Variable name	Definition	Codes	Comments
	Sex	Male or Female or Unsexed	M,F,U	
	Mat	Maturity Stage	Stages 1-8	
	ICES division		See list of ICES divisions	N/A
Quarterly Otolith Tally Sheet	Gear type	Type of gear used	see Gear codes	The list of gear codes is not complete at present. Note any further observations on gears used in comment box.
	Quarter	Division of a year into 3 monthly intervals	N/A	N/A
	Sampler's Initials	Initials of Samplers name	N/A	N/A

PRACTICAL PROBLEMS OF CATCH SAMPLING AT SEA

ASKING PERMISSION TO SAMPLE ONBOARD A FISHING VESSEL

If the skipper is not aware of the FEAS catch sampling programme then explain the work carried out, the scientific rationale behind catch sampling, the sampling protocol and the information that will be obtained on board eg landings tally etc. Emphasis should be put on the fact that our work is for biological research. Explain exactly the sampling methods that will be used on board. Mention a few boats that you have already sampled on. Please give a copy of the **Wheel House Guide to Catch Sampling Programme** to the skipper.

ADVERSE WEATHER CONDITIONS/MOTION OF THE VESSEL

If weather conditions or the motion of the vessel are such that it makes measuring the discards at sea impossible, then the only option is to bring the samples back to the port laboratory for analysis. If the crew do not wish to store boxes of discards for the FAT then no samples can be obtained. Sea sickness as a result of the tow factors above may also prevent a FAT from measuring a discard sample from every haul.

WORK SPACE AVAILABLE

Workspace is of prime importance. If a fishing vessel is small there may not be bought room for an extra person to be working on deck at the same time as the crew. This may be overcome in some cases if the FAT works on the sample after the crew have finished handling the catch, although for safety reasons, it is not desirable for the sampler to be working alone on the deck. On larger vessels there may still be a scarcity of workspace depending on the layout of the gear on the deck. The FAT should cause as little inconvenience as is possible to the crew members.

LEVEL OF CO-OPERATION

Co-operation is vital when sampling at sea. Initially there has to be co-operation if a sampler is to be given permission to board a fishing vessel for a sampling trip (this being totally at the skipper's discretion). Whilst onboard, assistance is often required to lift fish boxes etc. The crew members need to put the landings into the hold as soon as possible but if asked a co-operative crew will usually keep some on deck until the sampler has measured them.

WORKING PROCEDURES ONBOARD THE VESSEL

More often than not there will be the space/time constraints aboard the vessel and it may be difficulty to access fish for measuring. Nonetheless, it is essential to measure a representative length frequency of the target species landed as well as obtaining a box of discards for at least 75% of the hauls.

THE DISTRIBUTION OF THE CATCH IN THE POUND

If the catch is sorted directly from the pound then the question must be asked – Is it homogeneously mixed so that a random sample can be taken, or are the fish / non fish discards stratified? Because of this possible problem it is essential that the sample is taken from different areas and at different depths of the pound.

TIME AVAILABLE TO WORK ON DISCARDS

It may be impossible to measure a discard sample from each haul on a boat trip. In the case of certain beam trawlers – trawls are carried out approximately every two hours so it is very difficult if not impossible to have a discard sample analysed before the next haul is taken onboard. During the night a few hauls are missed also because the sampler has to sleep!! If this situation should arise, the sampler should aim to sample at different times each day so that during the trip the entire 24-hour period covered. This can be particularly important in, for example, the *Nephrops* fishery where it is well known that the movement of *Nephrops* in the water is very much light dependant.

OBTAINING *NEPHROPS* SAMPLES

On a *Nephrops* directed trip –aswell as the normal sampling protocols, a sample also needs to be taken ashore. This consists of two half boxes of samples.

- **½ fish box of unsorted bulk catch**
- **½ fish box of discards**

Once ashore these are to be given to the local port based analyst and they will organize a payment to the skipper for these samples.

½ fish box of unsorted bulk catch

- Take ½ a box randomly from the fish sorting table before any of the commercial fish or prawns are removed
- The box of sample should be washed and dipped
- Label clearly as a CATCH sample, with boat name and date

½ fish box of discards

- Take ½ box from the sorting table after all of the commercial prawns and fish have been removed
- The box of sample should be washed and dipped
- If tailing of prawns onboard by crew the discard sample has to contain the prawn heads and small whole undersize prawns else this sample is not usuable for analysis
- Label clearly as a DISCARD sample with boat name and date

When you come ashore, inform the local port based analyst or Helen McCormick that you have a sample.

Michael McAuliffe	Greencastle	087 2297631
Dermot Fee	Dunmore East	087 1323336
Ross Fitzgerald	Galway – but covers East coast	086 8335587
Sean O Connor	Castletownbere	087 1208813
Tobi Rapp	Castletownbere	087 6703863
Helen McCormick	Galway	087 9157577

THEORY BEHIND DISCARD SAMPLING: CALCULATION OF RAISING FACTORS

The total weight of discards present in a haul (Dt) is obtained by subtracting the known landings (for a haul) from the estimated total catch for that haul, (C) - (L), and converting to kilograms assuming 40 kg boxes. If we likewise express the discard sample in box equivalents, and accept that each box is typically 40 kg, we can calculate the weight of discards sampled (Ds). The proportion of non-fish discards is estimated from the discard sample, raised to the total discards and subtracted from the total weight of discards in the haul. The Raising factor for this haul is then given as the ratio of total weight of fish discards present in a haul to the weight of discards sampled for that haul

$$\text{R.F.} = \frac{D_t}{D_S}$$

This raising factor is used to raise the species specific weight composition of the discards sample to the haul level. Table 2.3 gives a worked example (using fictitious data) of how discard rates are calculated.

Table 2.3 A worked example of the calculation of discard rates (adopted since September 2006)

Variable	Haul 1	Haul 2	Haul 3	Haul 4	Haul 5
Catch (box)	100	60	70	70	60
Landings (box)	50	40	45	71.5	55
Discards (box)	50	20	25	-1.5	5
Discard sample (box)	1	1	1	1	1
Non-fish discards (proportion of sample)	0.05	0.50	0.95	0.20	0.50
Non-fish discards in total discards (box)	2.50	10.00	23.75		2.50
Fish discards	47.50	10.00	1.25		2.50
Raising factor	50	20	25		5
Haddock landings (box)	40	30	4		8
Haddock landings (kg)	1600	1200	160		320
Haddock discards in sample	80	25	42		43
Haddock discards in catch	4000	500	1050		215
Weight haddock discards (kg) (LW regression)	1120	140	300		60
Kg haddock discards to Kg haddock landed	0.7	0.12	1.8		0.18

Red column = invalid haul due to negative discard value.

3.

REFERENCE DATA AND CODES FOR SAMPLING

The reference data included in this chapter are:

- Port codes
- Haul Success Codes
- Gear codes
- Wind force
- Sea state
- Sea swell
- Ground type
- Conversion factors
- Fish Condition
- Grade
- Species names
- Conversion table for fathoms to metres

CRUISE SHEET

Port codes

Port	Port Code
Ardglass	ARD
Arklow	ARK
Balbriggan	BBN
Ballycotton	BCN
Baltimore	BMR
Burtonport	BUR
Castletownbere	CTB
Cleggan	CLE
Clogherhead	CHD
Cobh	COB
Cork	COR
Courtmacsherry	CMY
Derry	DY
Dingle	DIN
Downings	DOW
Dun laoghaire	DLR
Duncannon	DCN
Dunmore East	DE
Fenit	FEN
Fleetwood	FWD
Galway	GAL
Greencastle	GRE
Helvic	HEL
Holyhead	
Howth	HOW

Port	Port Code
Kilkeel	KKE
Killary	KLY
Killybegs	KBG
Kilmore Quay	KMR
Kilronan	
Kinlochbervie	KIN
Kinsale	KSE
Moville	MOV
Passage east	PAS
Portavogie	PVG
Portmagee	PMG
Porturlin	POY
Rathmullan	RAT
Renard	REN
Ross a mhil	ROS
Rosslare	RLT
Schull	SCH
Skerries	SKE
Teelin	TEE
Union Hall	UNI
Valentia	VAL
Waterford	WAT
Wexford	WEX
Wicklow	WIC
Youghal	YOU

HAUL SHEET

Haul Success Codes

Code	Description
1	Successful - Fish Measured
2	Foul Haul - Fish Measured or Negative Discards
3	Successful – No Fish Measured
4	Foul Haul – No Fish Measured

Gear Codes

Gear name	Gear code
Dredge	DRB
Pots	FPO
Gillnet	GN
Gillnets (drift)	GND
Gillnets (set)	GNS
Trammel net	GTR
Hardlines and pole-lines	LHP
Long liner	LL
Longline (drift)	LLD
Longline (set)	LLS
Otter Board Trawl	OTB
Otter Board Trawl used as Control	OTB_Control
Otter Board Trawl with Grid	OTB_G
Otter Board Trawl with Panel	OTB_P
Mid-water otter trawl	OTM
Purse seine	PS
Bottom pair trawl	PTB
Mid-water pair trawl	PTM
Danish Seine (anchor)	SDN
Scottish seine (fly-dragging)	SSC
Scottish seine (fly-dragging) with Panel	SSC_P
Beam Trawl	TBB
Triple Rig	TRR
Twin rig otter trawl	TWR
Twin Rig Otter Trawl used as Control	TWR_Control
Twin Rig Otter Trawl with Grid	TWR_G
Otter Board Trawl with Seltra	OTB_S
Otter Quad Trawls	OTQ
Twin Rig Otter Trawl with Panel	TWR_P

Note…always check Gear being used with Skipper, some boats may be using grids or panels or may switch gears during the trip.

Wind force

Beaufort Force	Description of wind	Wind Speed (knots)	Appearance of sea
0	Calm	Less than 1	Sea like a mirror
1	Light air	1-3	Ripples with the appearance of scales are formed but without foam crests
2	Light breeze	4-6	Small wavelets, still short but more pronounced. Crests have a glassy appearance and do not break.
3	Gentle breeze	7-10	Large wavelets. Crests begin to break. Foam of glassy appearance. Perhaps scattered white horses.
4	Moderate breeze	10-16	Small waves, becoming longer. Fairly frequent white horses.
5	Fresh breeze	17-21	Moderate waves, taking a more pronounced long form. Many white horses are formed. Chance of some spray.
6	Strong breeze	22-27	Large waves begin to form. White foam crests are more extensive everywhere.
7	Near gale	28-33	Probably some spray. Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind
8	Gale	34-40	Moderately high waves of greater length. Edges of crests begin to break into spindrift. Foam is blown in well marked streaks along the direction of the wind.
9	Strong gale	41-47	High waves. Dense streaks of foam along the direction of the wind. Crests of waves begin to topple, tumble and roll over. Spray may affect visibility.
10	Storm	48-55	Very high waves with long overhanging crests. The resulting foam, in great patches, is blown in dense white streaks along the direction of the wind. On the whole, the surface of the sea takes a white appearance. The tumbling of the sea becomes heavy and shock-like. Visibility affected.
11	Violent Storm	56-63	Exceptionally high waves. (Small and waves. (Small and medium sized ships might be for a time lost to view behind the waves.) The sea is completely covered with long white patches of foam lying long the a direction of the wind. Everywhere the edges of the wave crests are blown into froth. Visibility affected.
12	Hurricane	64-71	The air is filled with foam and spray. Sea completely white with driving spray. Visibility very seriously affected.

Sea state

Code	Description	Avg. Wave Height (m)
0	Calm (glassy)	-
1	Calm (rippled)	0-0.10
2	Smooth	0.10-0.50
3	Slight	0.50-1.25
4	Moderate	1.25-2.50
5	Rough	2.50-4
6	Very rough	4-6
7	High	6-9
8	Very high	9-14
9	Phenomenal	over 14

Sea swell

Code	Description
0	No swell
1	Very low (short or low wave)
2	Low (long and low wave)
3	Light (short and moderate wave)
4	Moderate (average and moderate wave)
5	Moderate rough (long and moderate wave)
6	Rough (short and heavy wave)
7	High (average and heavy wave)
8	Very high (long and heavy wave)
9	Confused (wave length and height indefinable)

Specification	Meters
Short wave	<100
Average wave	100-200
Long wave	>200
Low wave	<2
Moderate wave	2-4
Heavy wave	>4

Example: (as it appears on the haul sheet)

Sea state	Direction	Swell
4	SW	2

Wind Dir, Swell Dir – 16 points of the compass plus VAR (variable)

Ground type

Abbreviations only should appear on the haul sheet

Ground type	Ground type
c S	coarse Sand
c S G	coarse Sand Gravel
c S Sh	coarse Sand Shell
c S St	coarse Sand, Stone
f M	fine Mud
f M S	fine Mud Sand
f S	fine Sand
f S M	fine Sand Mud
f s Sh	fine Sand, Shells
G	Gravel
G Sh	Gravel, Shells
G St	Gravel Stone
h	hard
M	Mud
M f S	Mud fine Sand
M S	Mud Sand
M S Sh	Mud Sand Shell
Mi	mixed
P	Pebbles
R	Rock
R G	Rock Gravel
R M	Rock Mud
R S Sh	Rock Sand Shell
S	Sand
S G	Sand, Gravel
S M	Sand, Mud
S R	Sand, Rock
S Sh	Sand, Shells
S St	Sand, Stone
Sh	Shell
Sh ST	Shell Stone
sm St	small Stones
So	soft
SSt Sh	Sand Stone Shell
St	Stone

Note: Adjectives are in the lower case and nouns are in the upper case;
For example: 'S St' means Sand, Stones (two ground types in the area) whereas 'sm St' means small stones (one ground type in the area).

RETAINED CATCH TALLY SHEET

Conversion factors

(Gutted to round)

(Retained tally sheet)

Species	Factor
Angler-Budegassa	1.22
Angler-Piscatorius	1.22
Black sole	1.04
Bib	1.12
Brill	1.09
Black Scabbard	1.24
Blue Ling	1.17
Blue Whiting	1.15
Catfish	1.18
Cod	1.17
Conger eel	1.125
Dab	1.11
Dogfish	1.12
Flounder	1.05
Forkbeard	1.11
Four Spot Megrim	1.05
Grenadier	1.05
Haddock	1.17
Hake	1.11
Halibut	1.08
Herring	1.12
John Dory	1.125
Lemon sole	1.05
Ling	1.14
Mackerel	1.09
Megrim	1.06
Norway Haddock	1.1
Plaice	1.07
Pollack	1.17
Ray	1.15
Red Gurnard	1.04
Redfish	1.19
Saithe	1.19
Scad	1.08
Siki Shark	1.33
Skate	1.13
Spurdog	1.05
Tailed Prawns	3
Torsk	1.14
Tub Gurnard	1.04
Turbot	1.09
Whiting	1.18
Witch	1.05
Other Demersal	1.1
Other Flatfish	1.05
Angler (Tails Only)	3
Crab Edible (Claws)	4
Skate (Wings)	2.09

Note: If Cod roe is landed record the weight of the roe as for Round Cod

Fish Condition

Claws
Gutted
Headless
Roe
Round
Tails Only
Whole

Grade

GradeDescription
Ungraded
Small
Medium
Large
Small Medium
Large Medium
0-5
5-10
10-15
15-20
20-30
30-40
40-50
50-60
Tails
Females

MEASURED ONLY SHEET

Only the species names in the left hand column are to be used (spellings should be exactly as shown)

Species	Scientific Name	Also known as
Alfonsinos	Beryx spp.	
Angler-budegassa	Lophius budegassa	black – bellied Monkfish
Angler-piscatorius	Lophius piscatorius	White – bellied Monkfish
Arctic Skate	Raja hyperborea	
Argentinidae	Argentina spp	
Bairds smooth Head	Alepocephalus bairdii	
Barrel fish	Hyperoglyphus perciformis	
Bib	Trisopterus luscus	Pouting, Whiting pout, Pout
Birdbeak Dogfish	Deania calcea	
Black Dogfish	Centroscyllum fabricii	
Black Scabbard	Aphanopus carbo	
Black sea bream	Spondyliosoma cantharus	
Black skate	Raja nidarosiensis	
Black sole	Solea solea	Sole, Dover Sole
Black-fish	Centrolophus niger	
Black-mouthed Dogfish	Galeus melastomus	
Blenny	Blenniidae	
Blonde ray	Raja brachyura	
Blue antimora	Antimora rostrata	
Blue Butterfish	Stromateus fiatola	
Blue Jack Mackerel	Trachurus picturatus	
Blue ling	Molva dypterygia	
Blue Ray	Breviraja caerulea	
Blue Shark	Prionace glauca	
Blue whiting	Micromesistius poutassou	
Blue-mouth	Helicolenus dactylopterus	
Blunt Nose Six Gill Shark	Hexanchus griseus	
Boar-fish	Caprus aper	
Brill	Scophthalmus rhombus	
Bull rout	Myoxocephalus spp	
Butterfly goby	Amblygobius albimaculatus	
Butterfly Ray	Gymnura spp	
Bythidae	Bythidae	
Capelin	Mallotus villosus	
Cardinal Fish	Epigonus telescopus	
Catfish	Anarhichas lupus	Wolf-fish
Cod	Gadus morhua	Codling / Tommy cod (small)
Cod Roe	Cod eggs	
Common Cuttlefish	Sepia Officinalis	
Common Octopus	Octopus vulgaris	
Common Sea bream	Pagrus pagrus	

Species	Scientific Name	Also known as
Common skate	Dipturus batis	
Common Squid	Loligo Vulgaris	
Conger eel	Conger conger	
Crab-edible	Cancer pagurus	
Crayfish	Palinurus vulgaris	
Cuckoo ray	Raja naevus	
Cuckoo Wrasse	Labrus Mixtus	
Dab	Limanda limanda	
Deep Sea Redfish	Sebastes mentella	
Dragonet	Callionymiidae	
Electric Ray	Torpedo nobiliana	
Elegant Cuttlefish	Sepia Elegans	
European Anchovy	Engraulis encrasicolus	
European Eel	Anguilla anguilla	
False Boarfish	Neocyttus helgae	
Flounder	Platichthys flesus	Fluke
Forkbeard	Phycis phycis	
Four-spot megrim	Lepidorhombus boscii	
Fries Goby	Lesueurigobius friesii	
garfish	Belone belone	
Goby	Gobius spp	
Golden Redfish	Sebastes marinus	
Greater argentine	Argentina silus	
Greater forkbeard	Phycis blennoides	
Greater Sandeel	Hyperoplus lanceolatus	
Greenland halibut	Reinhardtius hippoglossoides	
Grey gurnard	Eutrigla gurnardus	
Grey Tiggerfish	Balistes capriscus	
Gulper shark	Centrophorus granulosus	
Haddock	Melanogrammus aeglefinus	
Hake	Merluccius merluccius	
Halargyreus johnonii	Halargyreus johnonii	
Halibut	Hippoglossus hippoglossus	
Hatchet fish	Argyropelecus hemigymnus	
Herring	Clupea harengus	
Himontolophus groenlandicus	Himontolophus groenlandicus	
Hollowsnout grenadier	Coelorinchus coelorinchus	
Iceland Catshark	Apristurus laursonii	
John Dory	Zeus faber	
Kitefin shark	Dalatias licha	Darkie Charlie
Lantern Fish	Lampanyctus Crocodilus	
Large eyed Rabbitfish	Hydrolagus mirabilis	
Leafscale gulper shark	Centrophorus squamosus	
Lemon sole	Microstomus kitt	
Lepidion eques	Lepidion eques	
Lesser Argentine	Argentina sphyraena	
Lesser flying squid	Todaropsis eblanae	
Lesser redfish	Sebastes viviparous	
Lesser Spotted Dogfish	Scyliorhinus canicula	

Species	Scientific Name	Also known as
Ling	Molva molva	
Lobster	Homarus gammarus	
Long rough dab	Hippoglossoides platessoides	
Longnose grenadier	Coelorinchus carminatus	
Longnose Velvet Dogfish	Centroscymnus crepidator	
Longnosed Skate	Dipturus Oxyrinchus	
Lumpsucker	Cyclopterus lumpus	
Mackerel	Scomber scombrus	
Mailed Gurnard	Peristedion Cataphractum	
Meagre	Argyrosomus regius	
Mediterranean horse mackerel	Trachurus mediterraneus	
Megrim	Lepidorhombus whiffiagonis	
Mora	Mora moro	
Mouse Catshark	Galeus murinus	
Murrays longsnout Grenadier	Trachyrynchus murrayi	
Nephrops	Nephrops norvegicus	
Norway bullhead	Micrenophrys lilljeborgii	
Norway pout	Trisopterus esmarkii	
Norwegian topknot	Phrynorhombus norvegicus	
Nurse Hound	Scyliorhinus stellaris	Greater Spotted Dog,, Bull Huss
Octopus	Octopodidae	
Orange Roughy	Hoplostethus atlanticus	
Pale Catshark	Apristurus aphyodes	
Pallid Sculpin	Cottonculus thomsonii	
Pandalid Shrimps	Pandalus spp.	
Pearlfish	Echiodon drummondi	
Pearl-side	Maurolicus spp.	
Pilchard	Sardina pilchardus	
Pipefish	Indostomus paradoxus	
Pipefish-greater	Syngnathus acus	
Piper	Trigla Lyra	
Plaice	Pleuronectes platessa	
Pogge	Pogonophryne spp	Armed bullhead, Hook-nose
Polar Sculpin	Cottunculus microps	
Pollack	Pollachius pollachius	White pollack
Poor cod	Trisopterus minutus	
Portuguese dogfish	Centroscymnus coelolepis	
Pufferfish	Tetraodontidae	
Queenies	Aequipecten opercularis	
Rabbitfish	Chimaera monstrosa	
Rat-tails	Macrouridae	
Ray	Rajidae	
Red Band-fish	Cepola macrophthalma	
Red gurnard	Aspitrigla cuculus	
Red mullet	Mullus surmuletus	
Red seabream	Pagellus bogaraveo	
Redfish	Sebastes sp.	

Species	Scientific Name	Also known as
Reticulate Dragonet	Callionymus reticulatus	
Ribbon Fish	Procambarus bivitattus	
Rissos smooth Head	Alepocephalus rostratus	
Rockling	Gaidropsarus spp	
Rough head Grenadier	Macrourus berglax	
Rough snout Grenadier	Trachyrynchus trachyrynchus	
Round Ray	Raja fyllae	
Roundnose Grenadier	Coryphaenoides rupestris	
Saithe	Pollachius virens	Black pollack, Coley, Coalfish
Sand sole	Solea lascaris	
Sandeel	Ammodytidae	
Sandy Ray	Leucoraja circulcaris	
Saurey Pike	Scomberesox saurus	
Scabbardfish	Aphanopus spp.	
Scad	Trachurus trachurus	Horse mackerel, Craig/Creg Herring
Scaldfish	Pleuronectiformes	
Scallop	Pecten maximus	
Scaly dragonfish	Stomias boa	
Sea bass	Dicentrarchus labrax	
Sea scorpion	Scorpaena spp.	
Shad	Alosa spp.	
Shagreen Ray	Leucoraja fullonica	
Shortfin squid	Illex spp	
Shovelnosed shark	Deania calceus	
Siki Shark	Squalidae	
Silver Bream	Blicca bjoerkna	
Silver Roughy	Hoplostethus mediterraneus	
Silver Scabbardfish	Lepidopus caudatus	
Silvery pout	Gadiculus argenteus	
Skate	Rajidae	
Small eyed ray	Raja microocellata	
Smelt	Osmerus spp.	
Smooth Grenadier	Nezumia aequalis	
Smooth hound	Mustelus mustelus	
smooth hounds nei	Mustelus spp	
Snake blenny	Ophidion barbatum	
Snake pipefish	Entelurus aequoreus	
Snipe-fish	Macrorhamphosus scolopax	
Softhead grenadier	Malacocephalus laevis	
Solenette	Buglossidium luteum	
Spanish Mackerel	Scomber japonicus	
Spearsnout Grenadier	Coelorhynchus labiatus	
Spider Crab	Maja brachydactela	
Spiny Eel	Notacanthus bonaparte	
Spotted dragonet	Callionymus maculatus	
Spotted ray	Raja montagui	
Sprat	Sprattus sprattus	
Spurdog	Squalus acanthias	Jemmy dog
Squid	Loligo spp.	
Starry Ray	Raja radiata	

Species	Scientific Name	Also known as
Starry Smooth-hound	Mustelus asterias	
Streaked Gurnard	Trigloporus Lastoviza	
Taractes rubescens	Taractes rubescens	
Thickback sole	Microchirus variegatus	
Thornback Ray	Raja clavata	
Three-bearded rockling	Gaidropsarus vulgaris	
Tope	Galeorhinus galeus	
Topknot	Zeugopterus punctatus	
Torsk	Brosme brosme	
Tub gurnard	Chelidonichthys lucerna	Tusk
Turbot	Psetta maxima	
Velvet Belly	Etmopterus spinax	
Wedge sole	Dicologoglosa cuneata	
Weever-greater	Trachinus draco	
Weever-lesser	Echiichthys vipera	
Whelk	Buccinum undatum	
Whiting	Merlangius merlangus	
Witch	Glyptocephalus cynoglossus	
Wrasse-ballan	Labrus bergylta	
Wreckfish	Polyprion americanus	

Conversion table for depth (fathoms to metres)-Fathoms x 1.82 = Metres

Fathoms	Metres	Fathoms	Metres	Fathoms	Metres	Fathoms	Metres
10	18	60	109	110	200	160	291
11	20	61	111	111	202	161	293
12	22	62	113	112	204	162	295
13	24	63	115	113	206	163	297
14	25	64	116	114	207	164	298
15	27	65	118	115	209	165	300
16	29	66	120	116	211	166	302
17	31	67	122	117	213	167	304
18	33	68	124	118	215	168	306
19	35	69	126	119	217	169	308
20	36	70	127	120	218	170	309
21	38	71	129	121	220	171	311
22	40	72	131	122	222	172	313
23	42	73	133	123	224	173	315
24	44	74	135	124	226	174	317
25	46	75	137	125	228	175	319
26	47	76	138	126	229	176	320
27	49	77	140	127	231	177	322
28	51	78	142	128	233	178	324
29	53	79	144	129	235	179	326
30	55	80	146	130	237	180	328
31	56	81	147	131	238	181	329
32	58	82	149	132	240	182	331
33	60	83	151	133	242	183	333
34	62	84	153	134	244	184	335
35	64	85	155	135	246	185	337
36	66	86	157	136	248	186	339
37	67	87	158	137	249	187	340
38	69	88	160	138	251	188	342
39	71	89	162	139	253	189	344
40	73	90	164	140	255	190	346
41	75	91	166	141	257	191	348
42	76	92	167	142	258	192	349
43	78	93	169	143	260	193	351
44	80	94	171	144	262	194	353
45	82	95	173	145	264	195	355
46	84	96	175	146	266	196	357
47	86	97	177	147	268	197	359
48	87	98	178	148	269	198	360
49	89	99	180	149	271	199	362
50	91	100	182	150	273	200	364
51	93	101	184	151	275	201	366
52	95	102	186	152	277	202	368
53	96	103	187	153	278	203	369
54	98	104	189	154	280	204	371
55	100	105	191	155	282	205	373
56	102	106	193	156	284	206	375
57	104	107	195	157	286	207	377
58	106	108	197	158	288	208	379
59	107	109	198	159	289	209	380

Conversion table for depth (fathoms to metres)-Fathoms x 1.82 = Metres

Fathoms	Metres	Fathoms	Metres	Fathoms	Metres	Fathoms	Metres
210	382	260	473	310	564	360	655
211	384	261	475	311	566	361	657
212	386	262	477	312	568	362	659
213	388	263	479	313	570	363	661
214	389	264	480	314	571	364	662
215	391	265	482	315	573	365	664
216	393	266	484	316	575	366	666
217	395	267	486	317	577	367	668
218	397	268	488	318	579	368	670
219	399	269	490	319	581	369	672
220	400	270	491	320	582	370	673
221	402	271	493	321	584	371	675
222	404	272	495	322	586	372	677
223	406	273	497	323	588	373	679
224	408	274	499	324	590	374	681
225	410	275	501	325	592	375	683
226	411	276	502	326	593	376	684
227	413	277	504	327	595	377	686
228	415	278	506	328	597	378	688
229	417	279	508	329	599	379	690
230	419	280	510	330	601	380	692
231	420	281	511	331	602	381	693
232	422	282	513	332	604	382	695
233	424	283	515	333	606	383	697
234	426	284	517	334	608	384	699
235	428	285	519	335	610	385	701
236	430	286	521	336	612	386	703
237	431	287	522	337	613	387	704
238	433	288	524	338	615	388	706
239	435	289	526	339	617	389	708
240	437	290	528	340	619	390	710
241	439	291	530	341	621	391	712
242	440	292	531	342	622	392	713
243	442	293	533	343	624	393	715
244	444	294	535	344	626	394	717
245	446	295	537	345	628	395	719
246	448	296	539	346	630	396	721
247	450	297	541	347	632	397	723
248	451	298	542	348	633	398	724
249	453	299	544	349	635	399	726
250	455	300	546	350	637	400	728
251	457	301	548	351	639	401	730
252	459	302	550	352	641	402	732
253	460	303	551	353	642	403	733
254	462	304	553	354	644	404	735
255	464	305	555	355	646	405	737
256	466	306	557	356	648	406	739
257	468	307	559	357	650	407	741
258	470	308	561	358	652	408	743
259	471	309	562	359	653	409	744

4.

SAFETY AT SEA

The Health and Safety Authority has overall responsibility for the administration and enforcement of health and safety at work in Ireland. The health and safety of all people at work is protected by the law. The Safety, Health and Welfare at Work Act (1989) applies to all places of work including fishing vessels, other vessels, piers etc. The sole purpose of this law is to reduce the number of workplace injuries or deaths, the vast majority of which can be easily prevented by taking straightforward safety precautions.

The employer / owner must ensure a reasonable level of safety on board a vessel. This includes:

- the design and maintenance of the vessel
- safe means of getting about the vessel
- safe machinery and equipment
- safe methods of working
- adequate information, instruction and supervision of employees
- provision of appropriate safety clothing and equipment

The employer / owner must regularly overview safety and record this in the safety statement.

On board a fishing vessel, the skipper is responsible for day to day management of safety. The skipper should review all safety measures before leaving port.

Those who work on the vessel must do so in a safe way – this means:

- using all safety equipment provided
- complying with all required safety measures
- letting the skipper know of any safety problems encountered

General Guidelines

Training and Safety Drills

Proper training and safety drills will reduce the risk of injury arising from any routine activities. Areas for which such training is available include:

- Sea Safety.
- Recovery of persons overboard.
- The operation of boats.
- Fire prevention and fire fighting.
- The operation of electrical fishing apparatus.
- The use of chemicals both on board vessels and inland.
- First aid.

Along with training however there are a number of practices, which will enhance safety for personnel, working on vessels. These include:

Familiarisation & Instruction

On boarding a vessel it is important that all staff familiarise themselves with the layout of the vessel and read any standing instructions or safety manuals which are on board. They should also receive safety instruction from the crew. It is vital that when on board that the deck officer or crew are consulted in relation to interaction in the work area.

Alertness

When involved in sea based activity it is the responsibility of all staff to be alert to their own safety and the safety of others on board. Attention must be paid to both major and minor dangers as both have the potential to develop into something much more serious.

Watch your step when boarding and leaving vessels and during launching as well as when working on deck as water, diesel, oil and fish-oils will make surfaces increasingly slippery. It is important that you hold onto handrails where they have been provided and particularly when using stairs (the light for the hatch to the accommodation should be kept on at all times). Take extra care when using the gangway ladder (using both hands to hold onto the rails) and ensure that the ladder itself is in a safe position. Never run while on deck.

Tiredness

It is essential that everyone takes proper rest when off-duty in order that work can be carried out safely and efficiently. Long hours without proper rest decrease alertness and increase the risk of accidents.

Tidiness

All equipment must be properly secured and stored after use in order to minimise the risk of accidents. Loose tools and equipment should be returned to their proper place and all walkways must remain free of obstructions at all times.

If a spillage occurs when on duty it must be cleaned/mopped up and all equipment must be cleaned after use. Decks should be kept clear of equipment not being used in the current operation. Care should be taken to ensure that all doors are shut properly when on board vessels.

First Aid

The purpose of First Aid is to give assistance to the victim of an accident or sudden illness. (See appendix 1). All staff must:

- Take part in a basic First Aid training course before going to sea.
- Familiarise themselves with the location of the First Aid box.
- Know who other trained First Aiders on the vessel are and alert them if an injury occurs.
- The Merchant Shipping Act 1894 requires skipper / owner of a vessel to report all accidents however slight. Marine Institute personnel must report all injuries however slight and insure that they are adequately treated.

- Record all injuries.

All staff must bring First Aid Kits on board vessels as part of their basic sea survival equipment.

Sea Sickness

Most people who go to sea will suffer from sea/motion sickness at one time or another resulting in the reduction of alertness and an adverse effect on judgement. Travel sickness tablets are available and some people find that these help, however a number of other practices should be kept in mind if suffering from seasickness:

If sick at sea, lying down on ones back will give relief and the chances of faster recovery will be increased.

Taking fresh air on deck generally helps. Leaning over the side never does and should always be avoided.

Alert a crew member to your illness, never hide away.

Fatty oily foods should be avoided, as the stomach will be especially sensitive. Instead food, which is easy to swallow, should be eaten. Strong odours from foods and from, for example diesel, should be avoided when suffering from seasickness if at all possible.

It should be remembered that after vomiting one feels immediately better, this may lead to a false sense of well being as further bouts of nausea may occur and one must be aware of this. For this reason food should be taken after being sick and work should be carried out at a less energetic pace to five the body a chance to recover. A lot of water should be consumed to prevent dehydration.

Smoking

Vessels will have no smoking areas such as the engine room and this rule is to be strictly observed. Cigarettes should be extinguished in ashtrays only and ashtrays must only be emptied into metal litterbins.

Weather Check

Always ensure that you have received a forecast of weather conditions in the area before going out to sea. The suitability of weather and sea conditions must be assessed in terms of the most hazardous part of the operation. If staff have any doubts about their ability to work safely in the prevailing conditions they should not go to sea if already at sea they should curtail the work. When working under adverse weather conditions extra care should be taken.

Concerns Over Safety

If staff have any concerns about their safety they should voice them to their superiors who will then inform the Institute Safety Officer. An employee shall not be expected to carry out any work, which he/she believes is contrary to this code, or anything, which he/she believes will endanger the lives of himself, his colleagues, or any other person.

If, when boarding a vessel an individual has ANY reason to believe that the vessel is unsafe he/she should not board.

Training: General Guidelines

All sea users must complete a sea survival course before participating in any sea/water-based activities. This course must be attended annually by all sea-going members of staff. It is also vital that Person Protective Equipment can be used safely and effectively. Regular drills must be held in order to facilitate this objective.

Training on the procedures to be adopted in the event of an emergency must be undertaken and practised regularly by all sea-going members of staff. Such training will include fire prevention and fire fighting, man-overboard and abandon ship procedures. All sea users should also complete a basic First Aid course before going to sea.

All sea users must be familiar handling procedures and should complete basic training in this area. The training provided should include instruction in rope handling. Training must also be provided in relation to the use of radios, flares, fire fighting and fire drills.

All persons involved in diving operations must be suitably qualified and must operate in accordance with the Safety in Industry Diving regulations.

Personal Protective Equipment

Body heat will be lost very quickly in the sea. A person not wearing the recommended clothing and Person Protective Equipment is unlikely to survive for more than one hour in the water. If core body heat falls by 2 degrees the victim will contact hypothermia. It is therefore vital that personnel wear the recommended Personal Protective Equipment in order to increase the chances of survival if such a situation arises.

It is the responsibility of every sea user to take care of his/her own Personal Protective Equipment and use it only for the purposes for which it was intended. Any person who knowingly allows his/her Personal Protective Equipment to be damaged will be required to replace the damaged item(s).

The basic equipment for survival in the water includes:

Life Jacket: This is the single most important item of Personal Protective Equipment and a suitable lifejacket is to be worn while on deck on board fishing vessels. Its importance lies in the fact that it

- Keeps you afloat without swimming
- Keeps head out of water

Life jackets should be stored in a ventilated locker and gas cylinders should be checked before going to sea.

Wessex abandonment suit. This should be kept on standby for an abandon boat scenario. It is an enclosed single piece waterproof garment to be worn over warm clothing and normal footwear. A recommended lifejacket should be worn over the suit. It is designed to exclude water during immersion at sea. Seals are in place to ensure that no water enters the suit. Gloves and a hood provide insulation. Inspections of suits should be performed regularly.

Deck suits provide floatation and insulation and should be worn when working on deck. The suit will delay hypothermia on immersion and provides thermal protection against cold water shock. When using the suit in an emergency it is important that you

- Do up all the zips
- Tighten the belt. Upon falling into the water WAIT for about one minute to allow your breathing to calm
- Tighten the suits traps
- Put up your hood and turn your back to the waves
- Stay as still as possible

Clothing In the event of an abandon ship situation put on as many layers of warm clothing (preferably wool) as you find with an anorak or oil skin as an outer layer. It is vital that you should keep your abandonment suit close to you at all times, it is likely to be the difference between life and death.

If it becomes necessary to abandon ship into the water, extra clothing will reduce the effects of cold shock, which may otherwise provide to be disabling or even fatal. A waterproof layer can prevent such severe loss of body heat. Entering the water slowly rather than very suddenly will also lessen the changes of developing cold shock. Once in the water body heat will be lost very quickly. Methods of conservation of body heat include:

- Keeping your head out of the water
- Refraining from swimming unless you are sure you will reach the shore
- Refraining from removing any clothing

Even if abandoning the craft into a life raft extra layers of clothing will conserve body heat until the rescue takes place.

Personal Locator Beacons (PLB). All Fisheries Assessment Technicians have been provided with PLBs and should be trained in their use. They may prove invaluable in the event of a Man Overboard situation.

Non-slip boots have been provided to the Fisheries Assessment Technicians and should be worn when working on the open deck, whether at sea or in harbour, in all hatches or elsewhere, wherever there is a risk of water, oil, diesel or fish-oils on the decks, when working in the vicinity of wires or winches, or when lifting heavy loads.

Extra safety precautions can be taken if it is believed prudent to so, so long as such measures do not increase safety risks in other respects.

SEA SAFETY GEAR AT FEAS

The following is an inventory of the sea safety gear to be used by FEAS technicians whilst in the field:

EPIRBs (Electronic Position Indicator Radio Beacon): LDT 126 distress beacon (24081). Powerful transmission on 121.5 MHz, lightweight distress beacon powered by a replaceable battery pack

COSALT ELITE twin chambered inflatable lifejackets with full splash hood and crutch straps (275 Newton with automatic inflation, approved by the Marine safety Agency)
Inflated by 60g disposable carbon dioxide cylinders, firing pins allow for automatic inflation on immersion

CREWSAVER crewfit lifejackets
Inflated by 30g disposable carbon dioxide cylinders, firing pins allow for automatic inflation on immersion

WESSEX suits – non insulated immersion suits – complies fully with the solas and department of transport (Marine Safety Agency) regulations for an immersion suit

X4 MULLION suits: a superior multi-purpose flotation suit,

Steel toe-capped wellingtons – waterproof, protective and ridged soled

Protective Clothing / Gear
The following is an inventory of the protective gear to be used by FEAS technicians whilst in the field: -

- White laboratory coats
- Plastic aprons
- Oilskin smocks and bibbed trousers
- White hats whilst working in fish processors
- Rigger boots can be ordered for individuals if required

It is the responsibility of every individual to read up on all aspects of safety at sea, on the pier side etc. and be well versed in donning their safety gear – there is no point in having very efficient safety equipment if people are unaware as to how to use them properly!

CONTRACTORS
All FEAS sea going contractors are issued with a PLB which is registered to them. All other PPE must be supplied by the contractor.

WHOS AT SEA

We have launched a new safety data base which will automatically update details of 'who's at sea' This will be activated by samplers sending a text to a dedicated number and the details will then be uploaded on to a database on the Marine Institute Website. In case of emergency there will be numerous people who will have access to this data base and can help co-ordinate emergency services if necessary.
This will be used for all personnel who are going to sea on Commercial vessels and who will be carrying Personal Locator Beacons.

Samplers Text Formats

A valid sampler trip departure is the following format:

Vessel Name/Departure Port/Fishing Grounds/Estimated Days at Sea

For example (valid trip departure text):

myboat/galway/aran/10

This departure text from a sampler will mean:
Vessel: Myboat
Departure Port: galway
Fishing Grounds: Aran
Estimated Days at Sea: 10

You will receive a confirmation text, if you do not receive this text try again as sometimes there are network issues. If you do not get through after a number of attempts then send the details on to Helen who can manually upload you.

Upon return of the fishing trip the sampler will need to text: return

All text messages will need to be sent to: **0044 7797801718**

Can you all send this text message on departure using the above format taking care of spacing etc. No other additional text or spaces should be added to this message or else it will come back as an error. The best thing to do would be to save it as a draft in your text messages.

5.

APPENDICES

APPENDIX 1

DEMERSAL SAMPLING

SHEETS

Fisheries Science Services, Marine Institute **Page No.**

Discard Cruise Report

SAMPLER .....

Vessel *Name* .....

LOA (m) ..... *Kw* .....

Reg No. .....

Gear .....

ICES Division(s) .....

Cruise Code FAT/ /13 / .....

Ports *Dept:* ..... *Arrive:* .....

Dates / / 13 to / / 13

Times *Dept:* ..... hrs *Arrive.* ..... hrs

The Cruise

Fishing Grounds : _____

Average Duration of tows : _____ hrs General Weather Conditions : _____

Gear Damage (if any) : _____

Additional Information : _____

The Landings

Landings composition (main species and presentation) : _____

The Discards

Fish Discard composition (main species) : _____

Non - fish discards composition (main species) : _____

Discard Policy : _____

Samples *(required to keep track of data sheets and age samples)*

Total number of Hauls _____

Number of Hauls sampled _____

_____ boxes of discards was/were collected + delivered to _____

(if none please state reason below in comments)

Please tick box if included in discard sample

☐ Cod ☐ Had ☐ Whg ☐ Meg

☐ B.Sole ☐ L. Pisc ☐ L. Bud ☐ Plaice

Data Sheets *(count of number of pages)*

Discard Cruise Report ..... Haul Sheets ..... Aged Discard Sheets .....

Retained Catch Tally Sheets ..... Measured Only Sheets .....

Comments

General Information : _____

Skippers Name and Address (*for posting skippers report*)

(2) HAUL SHEET

Page No.

CRUISE CODE _____ / _____ / ____ / ____

HAUL Number																			
GEAR CODE																			
MESH SIZE (COD END) MM																			
SUCCESS CODE																			
ICES DIVISION*																			
FISHING GROUND*																			
TIME SHOT 24 Hr CLK	:				:				:				:				:		
DEPTH SHOT METRES																			
LAT SHOT* NORTH	°		´		°		´		°		´		°		´		°		´
LONG SHOT* WEST	°		´		°		´		°		´		°		´		°		´
SHOOT DATE	/	/			/	/			/	/			/	/			/	/	
TIME HAULED 24 Hr CLK	:				:				:				:				:		
DEPTH HAULED METRES																			
LAT HAULED* NORTH	°		´		°		´		°		´		°		´		°		´
LONG HAULED* WEST	°		´		°		´		°		´		°		´		°		´
HAUL DATE*	/	/			/	/			/	/			/	/			/	/	
Bird Bycatch (tick √)	Yes		NO		Yes		NO		Yes		NO		Yes		NO		Yes		NO
Mammal Bycatch (tick √)	Yes		NO		Yes		NO		Yes		NO		Yes		NO		Yes		NO
Reptile Bycatch (tick √)	Yes		NO		Yes		NO		Yes		NO		Yes		NO		Yes		NO
Decomposed carcass (tick √)	Yes		NO		Yes		NO		Yes		NO		Yes		NO		Yes		NO
WIND DIRECTION & FORCE																			
SEA STATE/ SWELL DIR/ SWELL																			
GROUND TYPE																			
BULK CATCH UNITS*																			
TOTAL LANDINGS UNITS*																			
DISCARDS SAMPLED UNITS*																			
LANDINGS SAMPLED UNITS*																			

***NOTES:**
ICES division : Where most of haul was carried out, eg. VIIa. Fishing ground: Where most of the haul was carried out. Please complete only where haul took place in a 'recognised' fishing ground.
Haul date : At time of hauling (midnight is written as 00.00). Latitude and longitude written as follows : 51 53.30' N and 006 29.50' W
Define units : Box or Kgs (Note unless otherwise stated we assume 1 Box = 40 kg)
Useful Conversion : Fathoms x 1.82 = Metres

Please use back of this page for additional comments

Bycatch = Any organism that comes in contact with the gear during fishing operation either collected on deck or falling out during hauling.
NB: If "YES" selected in Bird/Cetacean/Reptile or Decomposed Carcass field the specific details must be filled overleaf

Haul Success Codes

Code	Description
1	Successful- Fish Measured
2	Foul Haul- Fish Measured
3	Successful– No Fish Measured
4	Foul Haul– No Fish Measured

	Haul		Haul		Haul		Haul		Haul	
BYCATCH *										
Bird Bycatch observed (list species below)	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed
Mammal (list species below)	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed
Reptile Bycatch (list species below)	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed

Decomposing Carcas	**Mammal**	**Bird**	**Reptile**	**Mammal**	**Bird**	**Reptile**	**Mammal**	**Bird**	**Reptile**	**Mammal**	**Bird**	**Reptile**	**Mammal**	**Bird**	**Reptile**
Observed (tick √)	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
Number															
Species (Describe below if necessary)															

Comments

Bycatch = Any organism thts comes in contact with the gear during fishing operation either collected on deck or falling out during hauling.

3 RETAINED CATCH TALLY SHEET

Page No.

CRUISE CODE		Units	BOX		KGs		Other (specify)	

			Haul:				Haul:				Haul:				Haul:			
Species	Retention Code	Grade	Condition G/R	CF	QTY	Total	CF	QTY	Total		CF	QTY	Total		CF	QTY	Total	
TOTAL																		

Comments:

Retention code: (L) - landings; (OL) - obligation landings ;

Landings- wanted landings ie landings as per current fishing regulations

Obligation Landings- landings arising as a result of the Landings Obligation regulation ie quota species fish that may be above and or below the MCRS

Grade-as described in manual

Fish Grade Description

Ungraded, Small, Medium, Large, Small Medium, Large Medium

Nephrops Grade Description

0-5, 5-10, 10-15, 15-20, 20-30, 30-40, 40-50, 50-60, Tails, Females

Common Raising Factors. (See manual for complete list)

Angler (Bud\Pisc)	1.22	Ling	1.17
Angler (Tails Only)	3	Megrim	1.06
Black sole	1.04	Nephrops Tailed	3
Cod	1.17	Plaice	1.07
Haddock	1.17	Ray	1.15
Hake	1.11	Saithe	1.19
John Dory	1.125	Whiting	1.18
Lemon sole	1.05	Witch	1.05

(4 & 5) MEASURED ONLY SHEET

Page No.

CRUISE CODE			Haul No.					Grade	
Quantity*		Units		Presentation		Type		% NFD	

Have you measured all the fish of a particular species for this haul? (Please Tick)

Yes ☐ No ☐

Len.	Species:	Tot.	Len.	Species:	Tot.	Len.	Species:	Tot.
0			0			0		
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
0			0			0		
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
0			0			Len.	Species:	
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
0			0			Len.	Species:	
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
0			0			Len.	Species:	
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
0			0			Breakdown of Non Fish Discards		%
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					

*Example

Quantity	1	Units	Box	Presentation	G	Type	Discards	Grade	u

PRESENTATION refers to the state of the fish, ie. gutted (G) or round (R); TYPE refers to the source of the sample, ie. Discard (D), Landing (L); UNITs - Boxes or KGs

Please tick "yes" if all of the fish of a particular species were measured for the haul.

1/2 cm: Sprat, Herring, Boarfish   Sex: Elasmobranchs and Megrim   Identify Monk :

Cruise Code FAT /___ / ___ / ___ (6) **AGED DISCARDS SHEET** | Page No.

SPECIES | SAMPLED BY | SAMPLING PLACE | AGE READER

ICES Div.	
Gear	
Quarter	
Date	

CHECK LIST

L	No	L	No	L	No
1		1		1	
2		2		2	
3		3		3	
4		4		4	
5		5		5	
6		6		6	
7		7		7	
8		8		8	
9		9		9	
0		0		0	
1		1		1	
2		2		2	
3		3		3	
4		4		4	
5		5		5	
6		6		6	
7		7		7	
8		8		8	
9		9		9	
0		0		0	

Index No.	Len.	Wt	Age	Sex	Mat	Index No.	Len.	Wt	Age	Sex	Mat	Index No.	Len.	Wt	Age	Sex	Mat	Index No.	Len.	Wt	Age	Sex	Mat
1						26						51						76					
2						27						52						77					
3						28						53						78					
4						29						54						79					
5						30						55						80					
6						31						56						81					
7						32						57						82					
8						33						58						83					
9						34						59						84					
10						35						60						85					
11						36						61						86					
12						37						62						87					
13						38						63						88					
14						39						64						89					
15						40						65						90					
16						41						66						91					
17						42						67						92					
18						43						68						93					
19						44						69						94					
20						45						70						95					
21						46						71						96					
22						47						72						97					
23						48						73						98					
24						49						74						99					
25						50						75						100					

COMMENTS:

FSS: FAT 6

Fisheries Assessment Technicians Quarterly Discards Otoliths Taken

ICES Division ☐ **Gear Type** ☐ **Quarter** / **Sampler Initials** ☐

Length	**Whiting**	Total	**Haddock**	Total	**Cod**	Total	**Plaice**	Total	**B.Sole**	Total	**Megrim**	Total
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												

REQUIRED :- 5 OTOLITHS PER LENGTH GROUP,
FOR EACH ICES DIVISION, PER GEAR TYPE, PER QUARTER

FSS;FAT 7 (A)

Fisheries Assessment Technicians Quarterly Discards Otoliths Taken

ICES Division ☐ **Gear Type** ☐ **Quarter** ☐/ **Sampler Initials** ☐

Length	Hake	Total	L.bud	Total	L.pisc	Total		Total		Total		Total
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												

REQUIRED :- 5 OTOLITHS PER LENGTH GROUP,
FOR EACH ICES DIVISION, PER GEAR TYPE, PER QUARTER

FSS,FAT 7(B)

APPENDIX 2

EQUIPMENT CHECKLIST

WORK RELATED	PERSONAL
Small measuring board	Rucksack
1 M measuring board	Sleeping bag
Oilskins (top and bottoms)	Pillow & Pillow case
Wellingtons	Sheet
Heavy duty gloves	Flip flops
Household gloves	Flashlamp
Sampling equipment i.e. knives etc….	Alarm clock
Clipboard	Plastic bags
Data sheets	Toilet roll
PLB	Cool drinks
fish box (no holes)	Crackers / Fruit
Immersion suit	Towel
Life Jacket	
Protective sleeves	Book
Stationery	Layers of clothes
Survival suit	Tracksuit bottoms
Wellingtons (steel toe-capped)	Hat
I.D. book and laminated i.d.sheets	
Calculator	

APPENDIX 3

Code of Practice: Catch Sampling At Sea.

This applies to all FSS staff and contractors seeking to carry out sampling trips on board commercial vessels.

- All at sea samplers, including Marine Institute staff, and contract staff must complete the mandatory sea survival and safety awareness on board ship training courses prior to carrying out any discard trips on commercial vessels.

- The sampler must always seek permission from the owner/skipper of the vessel in advance of any trip.

- The sampler will ensure that the sampling protocols to be carried out on the trip are clearly explained to the skipper prior to going to sea and will ensure that all parties understand the types of data to be recorded.

- Sampler will record a minimum of 75% of the valid hauls. The sampler must agree the hauls to be sampled with the skipper.

- Estimates of marketable fish from each haul must be obtained from consultation with the skipper or his representative. Under no circumstances should the sampler estimate the marketable component of the catch without prior consultation.

- Before departing, the sampler should inform Helen McCormick or the assigned sampling co-ordinator of the date and time of departure, predicted date and time of return, and the vessel details.

- The sampler will ensure that he/she has all the mandatory personal protective equipment (PPE) on board with him/her and will ensure that the appropriate PPE is worn at all times.

- The sampler will familiarise him/herself with the vessel and ensure that they are aware of any off limits areas, and must comply with the ships health and safety regulations whilst on board. When onboard he/she should familiarise themselves with the layout of the vessel, location of lifeboats and read any standing instructions or safety manuals which are on board. They should also adhere to any safety instruction from the crew.

- The sampler must inform the skipper if any potential health and safety risks are identified whilst on board.

- A safe working space will be agreed between the skipper and the sampler, to ensure the safety of the sampler and also to minimise any possible impacts on the daily operations of the vessel.

- A personal copy of FEAS catch sampling protocols must be left onboard following completion of the trip

APPENDIX 4

Set Net Catch Sampling.

Set Net Fishing

The set net fishery is comprised of three types of net: Gill net, Tangle net and Trammel net. Each net is made by suspending a monofilament mesh netting between the leaded foot rope and the float fitted head rope. Gill nets and tangle nets have one mesh panel with a mesh size and hanging ratios that depends on the target fishery. They both capture fish according to their name – the gill net entraps the fish by gilling it, the fish swims through and gets caught at the gills. This makes the gill net quiet selective as the mesh size will determine the minimum size of fish gilled. In the tangle net the fish simply become entangled in the mesh. The trammel net has two panels one of a large outer mesh and the other of a smaller inner mesh size that is rigged to hang loose. The trammel net captures fish by the fish driving the small mesh through the larger mesh and essentially "bagging" themselves. For the trammel net the inner and outer mesh size/depth must be recorded. As there is only one gill net and tangle net mesh details are recorded in the "inner" recording field on datasheet.

Soak time for the sets nets depend on the target species. Typically a gill net set for cod is hauled after 24hrs while tangle nets set for spiny lobster (also commonly called Crayfish) are typically set for a week.

Sampling at sea.

As with all discard sampling it is important to sample in a way that collects the best data but minimises the disruption caused by the observer presence on the natural work flow of the boat and crew. Most vessels operating in the set net fishery are small (10-15m) therefore the first task is to find a safe point on the vessel where one can work, it is best to ask the crew where the best position is.

To facilitate the objective acquisition of data please ask the crew to retain all catch (landings and discards) as they haul the net. This will alter their usual practice somewhat but after explaining that you need this to get the best data they should understand.

On retaining the entire catch categorise the catch as described below:

Name	Description	Datasheet to be used
Seal Damage Discards	Fish damaged by seals unfit for market. (See below for seal damage description)	• Record bulk Seal Damage Discards in **"Haul Sheet"** • Record the lengths and/or count in **"Measured Only Sheet – Damage Discards"** Be sure to record the type - tick Seal Damage.
Invertebrate Damage Discards	Fish damaged by invertebrates i.e. Skinners (amphipods) or crabs. For amphipod damage the fish looks like it has been eaten from the inside out, often with skin only remaining. With crab damage the fish typically looks picked/pecked to pieces.	• Record bulk Invertebrate Damage Discards in **"Haul Sheet"** • Record the lengths and/or count in **"Measured Only Sheet – Damage Discards"** Be sure to record the type - tick Invertebrate Damage
Total Landings	All fish/shellfish going to market. (See bottom of table for Lobster/Spiny Lobster specific data)	• Record species specific tally on the **"Retained Catch Tally Sheet"** • Record the lengths in "**Measured Only Sheet – Landings"**
Discards	Fish unfit for market for any other reason other than seal or invertebrate damage (i.e. under size, non commercial etc…)	• Record the lengths of fin/shellfish and breakdown of non fish discards in **"Measured Only Sheet – Discards"**
Lobsters & Spiny Lobsters (aka Crayfish)	All lobsters/crayfish in the catch must be collected and recorded according to the data required in the datasheet.	• Record the length, sex, etc in **"Lobster /Spiny Lobster Measured Only Sheet"**

Obviously the sum total of all five components listed above is the entire catch and is entered as "Bulk Catch" on the datasheet.

Please note Seal Damage is damage attributable to large predators the most likely of which are seals or conger. This damage is characterised by:

* Removal of part or the entire visceral cavity
* Removal of all or part of the body incl. the visceral cavity
* large V shaped bites
* removal of fish skin.

Photo examples of Seal and Invertebrate damage available below.

Collection of data

Haul Sheet

It is important that all the required data are collected for each haul. Be sure to fill in all the relevant boxes in the Haul Sheet. The first data required are the gear parameters it is important to collect this at the haul level as the metrics may change from haul to haul. Please be careful on recording the correct Shoot Time/Date and the Haul Time/Date as these are used to calculate the soak time. The Lat & Long of each end of the string should also be recorded accurately.

The Bird/Mammal/Reptile/Decomposed Bycatch is defined as:
Any Bird/Mammal/Reptile/Decomposed organism that comes in contact with the gear during fishing operation either collected on deck or falling out during hauling. If one of these is observed and "YES" is selected in the Bird/Cetacean/Reptile or Decomposed Carcass field the specific details must be filled overleaf on the Haul Sheet

As with all discard trips record the Bulk Catch and Total Landings. Also record the Seal and Invertebrate Damage Discard components as described above. If zero seal and/or invertebrate damage is observed please enter “0” in the relevant box on the Haul Sheet. The collection of this data should be made easier by the fact that the crew will keep all the catch for you from a string.

Retained Catch Tally Sheet

Record all fish and shellfish retained for market in this sheet. For crustaceans record the appropriate unit: Box and/or kg for crabs Unit number for lobster and Spiny lobster (i.e. 6 lobster and 4 Spiny lobster). It is important to record all fish and/or shellfish brought to market in this sheet.

Measured Only Data Sheet

For set net discard trips we use three different Measured Only Datasheets as follows:

Measured Only Sheet – Landings	Recording length by species of all landed fish and/or shellfish
Measured Only Sheet – Discards	Recording the measurements by species of the discard component.
Measured Only Sheet – Damage Discards	Recording the measurements and/or numbers of the damage discard component by type – Seal damage and/or invertebrate damage.

Record measured only data for fish following normal discard sampling protocols for both landings and discards.

A count of numbers per species in the seal and invertebrate damage discards component will suffice as accurate measurement can be difficult. For crustaceans please measure according to the protocol specific to that species. For the discard component measurements are required from both finfish and commercial shellfish. During these specific trips, shellfish such as spider crab, edible crab, velvet crab, lobster, and Spiny lobster recorded in the “Non Fish Discards will also need to be measured.

To aid sampling a fourth datasheet is included for Measured Only - Lobster/Spiny lobster. Please measure and sex the entire Lobster/Spiny lobster catch and record whether retained or discarded. If discarded: note reason for discarding i.e. below the minimum landing size and/or v-notched. Also be sure to record the shell condition for both species and egg stages for lobster. Lobster egg stages are described on the datasheet.

Measurement and Sexing of crustaceans

Lobster: Using callipers measure the carapace length (CL) to the nearest millimetre below of all lobsters caught - from behind the eye to the end of the thorax (see Figure 1).

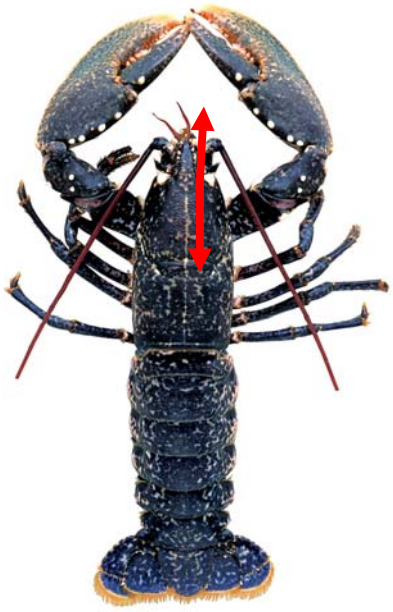


Fig1. Lobster measurement of carapace length

Sexual Dimorphism in Lobsters

Lobsters are easily sexed by looking at the pleopods on the first segment of the abdomen. The male's first pleopods are hard well defined structures while the female lobster has a more delicate feathery pleopod.

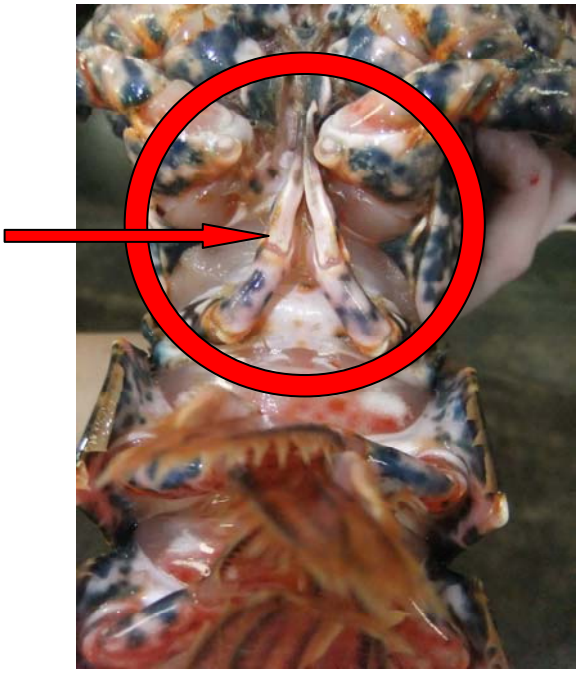


Fig 2. Male lobster with defined pleopods on first segment.

Fig 3. Pleopods are more delicate and smaller in females.

Spider Crab: Using callipers measure the carapace length (CL) to the nearest millimetre below– the distance between the point where the frontal spines of the rostrum join and the posterior edge of the carapace (see Figure 4)

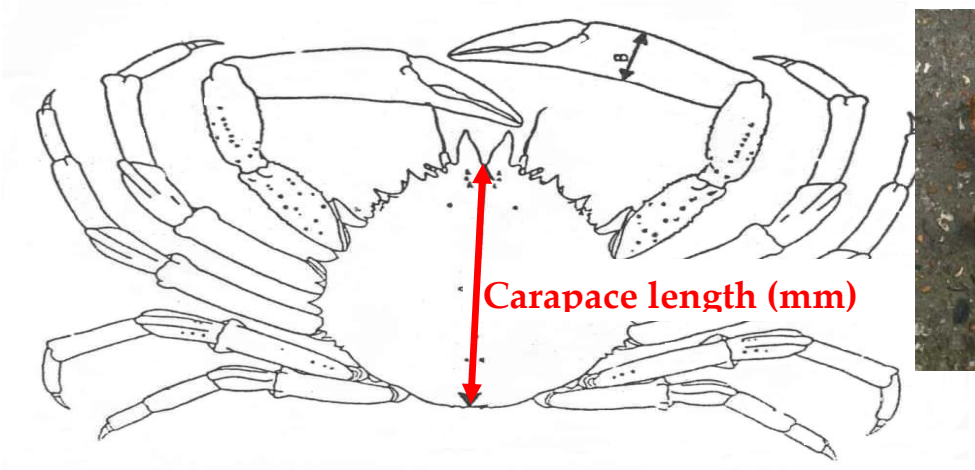


Fig. 4. Spider Crab measurement of carapace length

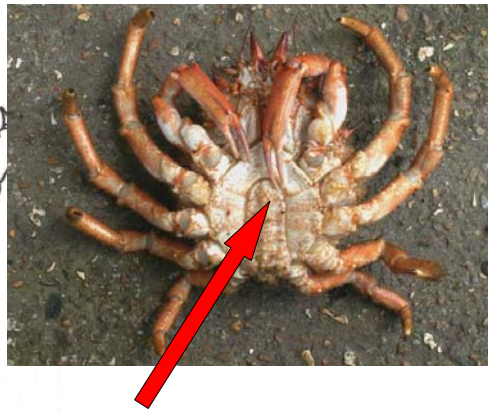


Fig.5. Male spider crab - narrow abdomen (Female abdomen is broader & rounder similar to edible crab below)

Edible Crab: Using callipers, ruler or measuring board measure the carapace width (CW) of each crab sampled, to the nearest millimetre below– the widest point across the carapace (see Figure 6).

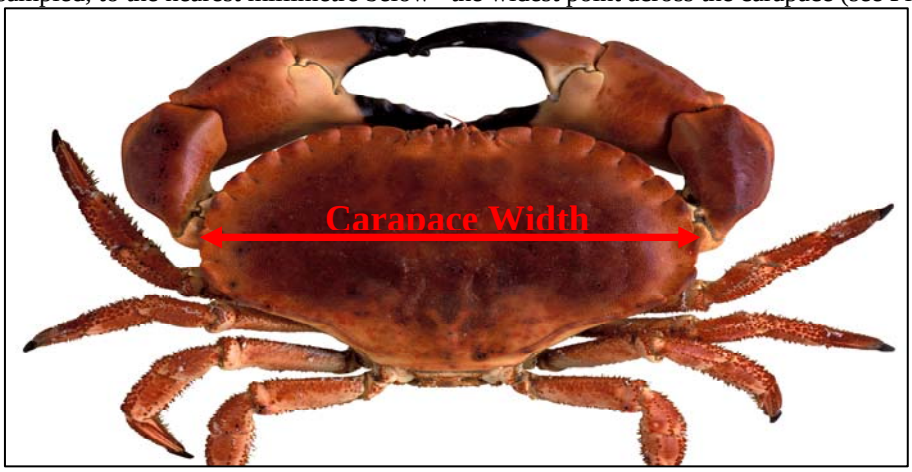


Fig 6. Edible Crab measurement of carapace width.

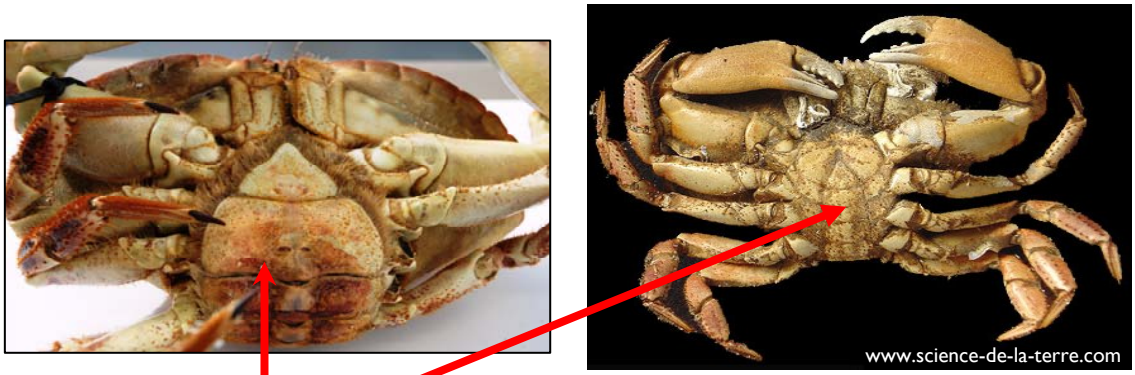


Fig 7. Female (left) and Male (right) brown crab – ventral view.
Abdomen in females is broad where as in males the abdomen is narrower.

Spiny Lobster: Using callipers measure the carapace length (CL) to the nearest millimetre below of all spiny lobster caught– from the tip of the rostrum to the end of the thorax (see Figure 8).

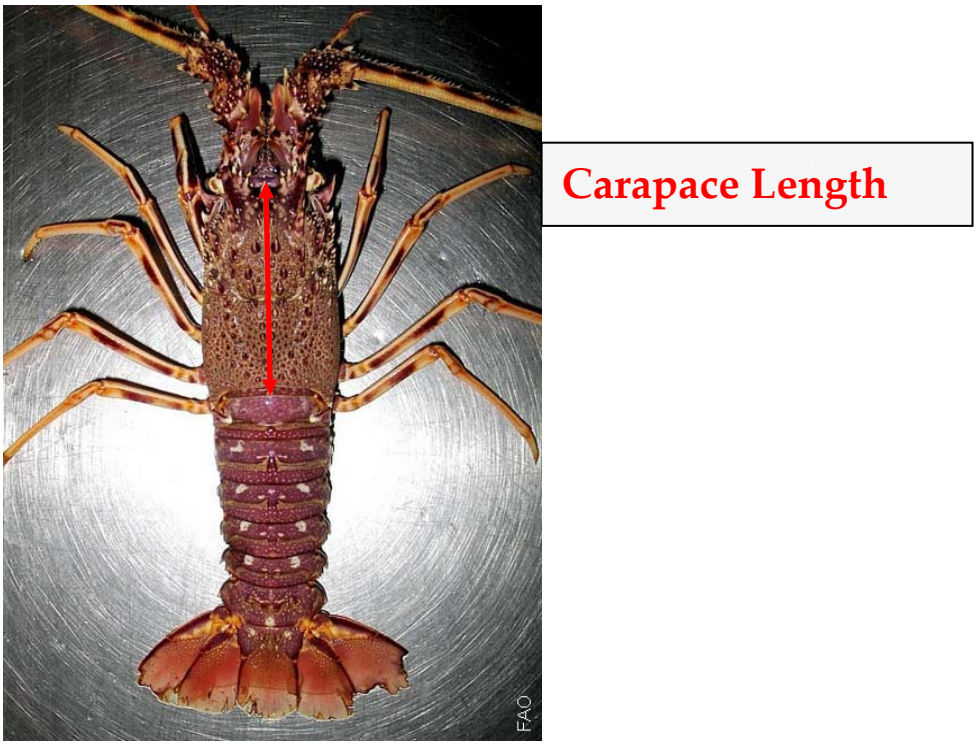


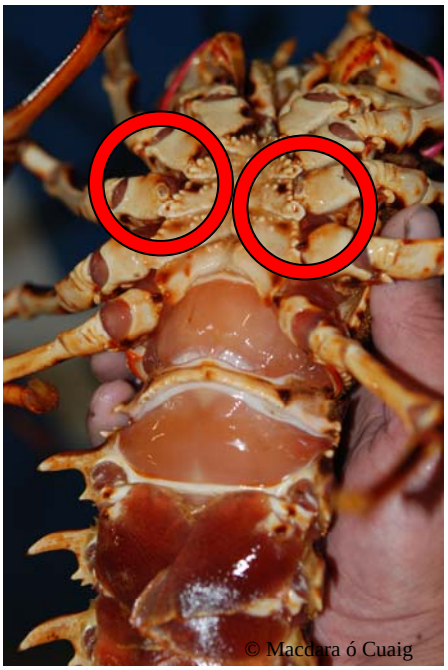
Fig.8 Spiny lobster measurement of carapace length

Sexual Dimorphism in Spiny lobster.

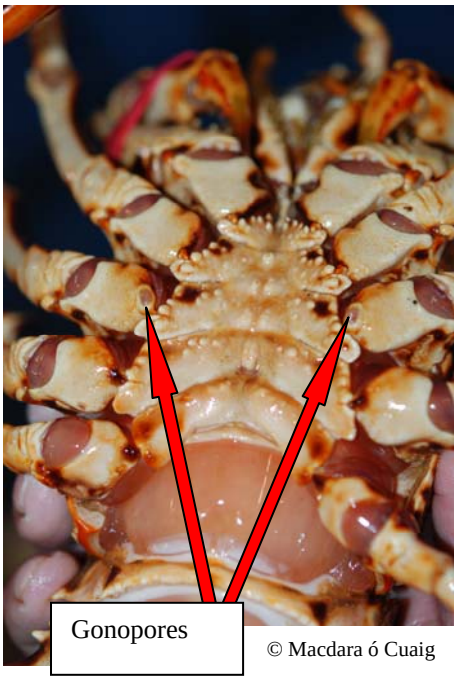
Males and females of all ages can be distinguished by the position of the two round genital openings or gonpores. In females, they are at the bases of the third pair of peripods while in males they are at the base of the fifth (last) pereiopods, furthest from the head and the closest to the abdomen. Mature females have enlarged pleopods. See Overleaf for photos.

Spiny Lobster
Palinurus elephas

FEMALE



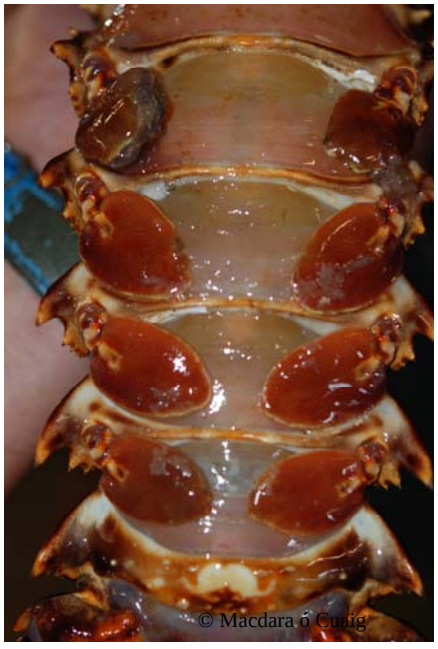
Gonopores at the bases of the third pair of peripods.



Mature Female with enlarged pleopods

MALE

Gonopores at the bases of the fifth pair of peripods.



Male with typical small pleopods.

Photo Examples of Seal and Invertebrate Damage in Set Net Fisheries

I. *(a)* *(b)* *(c)*

(d) (e) (f)

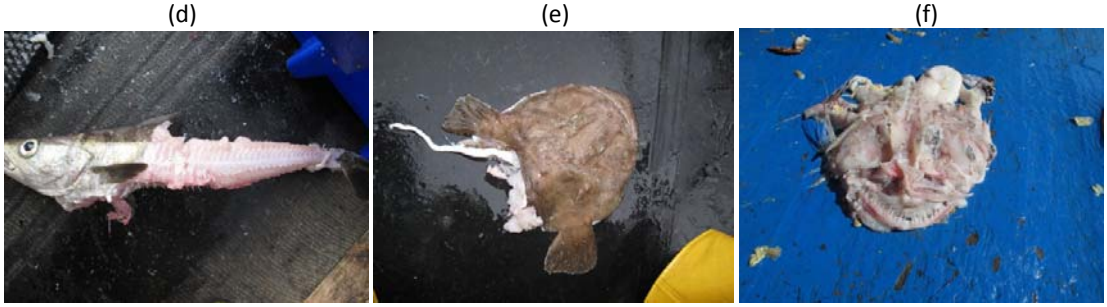


Figure 1: (a) to (f) Examples of Seal Damage

(g) (h) (i)

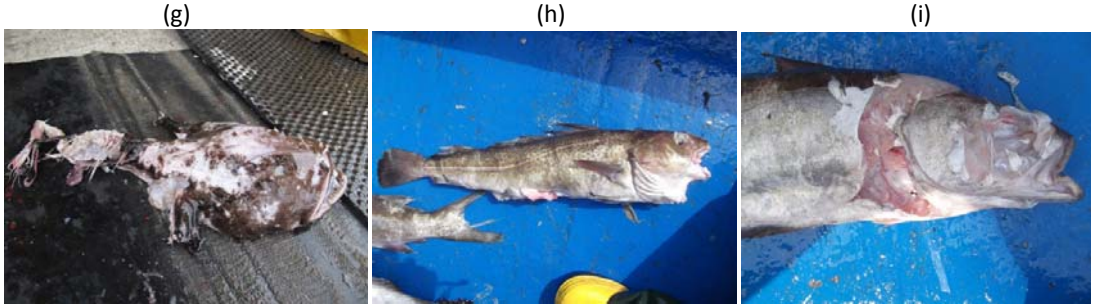


Figure 2: (g) to (i) Examples of fish damaged by other means, i.e. Invertebrate Damage
All Damage photos courtesy of BIM.

APPPENDIX 5
SET NET SAMPLING SHEETS

Fisheries Science Services, Marine Institute **Page No.**

Discard Cruise Report

SAMPLER .....

Cruise Code FAT/ / / / .....

Vessel *Name* .....

LOA (m) ..... *Kw* .....

Reg No. .....

Ports *Dept:* ..... *Arrive:* .....

Gear .....

Dates / / to / /

ICES Division(s) .....

Times *Dept:* ..... hrs *Arrive.* ..... hrs

The Cruise

Fishing Grounds : _____

Average Soak Duration : _____ hrs General Weather Conditions : _____

Gear Damage (if any) : _____

Additional Information : _____

The Landings

Landings composition (main species and presentation) : _____

The Discards

Fish Discard composition (main species) : _____

Non - fish discards composition (main species) : _____

Discard Policy : _____

Samples *(required to keep track of data sheets and age samples)*

Total number of Hauls _____

Number of Hauls sampled _____

_____ boxes of discards was/were collected + delivered to _____

(if none please state reason below in comments)

Please tick box if included in discard sample

☐ Cod ☐ Had ☐ Whg ☐ Meg

☐ B.Sole ☐ L. Pisc ☐ L. Bud ☐ Plaice

Data Sheets *(count of number of pages)*

Discard Cruise Report ..... Haul Sheets ..... Aged Discard Sheets .....

Retained Catch Tally Sheets ..... Measured Only Sheets .....

Comments

General Information : _____

CRUISE CODE	_____ / _____ / _____ / _____	Set Net Discard Datasheet	(2)HAUL SHEET	PAGE NO.	

HAUL NUMBER					
GEAR CODE					
PANEL LENGTH					
NUMBER PANELS PER STRING					
MESH SIZE MM	Inner / Outer	Inner / Outer	Inner / Outer	Inner / Outer	Inner / Outer
NUMBER OF MESHES DEEP	Inner / Outer	Inner / Outer	Inner / Outer	Inner / Outer	Inner / Outer
SUCCESS CODE					
ICES DIVISION*					
FISHING GROUND*					
TIME SHOT 24 Hr CLK	:	:	:	:	:
SHOOT DATE	/ /	/ /	/ /	/ /	/ /
DEPTH SHOT METRES					
LAT Buoy 1 NORTH	° ´	° ´	° ´	° ´	° ´
LONG Buoy 1 WEST	° ´	° ´	° ´	° ´	° ´
TIME HAULED 24 Hr CLK	:	:	:	:	:
HAUL DATE*	/ /	/ /	/ /	/ /	/ /
DEPTH HAULED METRES					
LAT Buoy 2 NORTH	° ´	° ´	° ´	° ´	° ´
LONG Buoy 2 WEST	° ´	° ´	° ´	° ´	° ´
Bird Bycatch (tick √)	Yes / NO	Yes / NO	Yes / NO	Yes / NO	Yes / NO
Mammal Bycatch (tick √)	Yes / NO	Yes / NO	Yes / NO	Yes / NO	Yes / NO
Reptile Bycatch (tick √)	Yes / NO	Yes / NO	Yes / NO	Yes / NO	Yes / NO
Decomposed carcass (tick √)	Yes / NO	Yes / NO	Yes / NO	Yes / NO	Yes / NO
WIND DIRECTION & FORCE					
SEA STATE/ SWELL DIR/ SWELL					
GROUND TYPE					
BULK CATCH UNITS*					
SEAL DAMAGE DISCARDS UNITS*					
INVERTEBRATE DAMAGED DIS. UNITS*					
TOTAL LANDINGS UNITS*					
DISCARDS SAMPLED (Total sampled regardless of type) UNITS*					
LANDINGS SAMPLED UNITS*					

*NOTES: ICES division : Where most of haul was carried out, eg. VIIa. Fishing ground: Where most of the haul was carried out. Please complete only where haul took place in a 'recognised' fishing grour
Haul date : At time of hauling (midnight is written as 00.00). Latitude and longitude written as follows : 51 53.30' N and 006 29.50' W
Define units : Box or Kgs (Note unless otherwise stated we assume 1 Box = 40 kg) Useful Conversion : Fathoms x 1.82 = Metres

Please use back of this page for additional comments

Seal Damage = Damage characterised by * removal of part or the entire visceral cavity * large V shaped bites
*** removal of all or part of the body incl. the visceral cavity * removal of fish skin.**

Bycatch = Any organism that comes in contact with the gear during fishing operation either collected on deck or falling out during hauling.
NB: If "YES" selected in Bird/Cetacean/Reptile or Decomposed Carcass field the specific details must be filled overleaf.

Haul Success Codes

Code	Description
1	Successful - Fish Measured
2	Foul Haul - Fish Measured
3	Successful – No Fish Measured
4	Foul Haul – No Fish Measured
5	Group 1 Species

FSS: FAT 2

	Haul		Haul		Haul		Haul		Haul	
BYCATCH *										
Bird Bycatch observed (list species below)	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed
Mammal (list species below)	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed
Reptile Bycatch (list species below)	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed	No. Released Live	No. Killed

Decomposing Carcas	**Mammal**	**Bird**	**Reptile**	**Mammal**	**Bird**	**Reptile**	**Mammal**	**Bird**	**Reptile**	**Mammal**	**Bird**	**Reptile**	**Mammal**	**Bird**	**Reptile**
Observed (tick √)	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N	Y N
Number															
Species (Describe below if necessary)															

Comments

Bycatch = Any organism thts comes in contact with the gear during fishing operation either collected on deck or falling out during hauling.

(3) RETAINED CATCH TALLY SHEET

Page No.

CRUISE CODE		Units	BOX		KGs		Other (specify)	

			Haul:			Haul:			Haul:			Haul:			Haul:		
Species	Grade	Condition G/R	CF	QTY	Total	CF	QTY	Total	CF	QTY	Total	CF	QTY	Total	CF	QTY	Total
TOTAL																	

Comments:

Grade
Small=S
Medium=M
Large=L

Condition is Round, Gutted, Whole, Tails, Claws etc

Common Raising Factors. (See manual for complete list)

Angler (Bud\Pisc)	1.23	Ling	1.12
Angler (Tails Only)	3	Megrim	1.05
Black sole	1.05	Nephrops Tailed	3
Cod	1.18	Plaice	1.05
Haddock	1.18	Ray	1.15
Hake	1.12	Saithe	1.18
John Dory	1.125	Whiting	1.12
Lemon sole	1.04	Witch	1.05

(4 & 5) MEASURED ONLY SHEET-Discards

Page no.

CRUISE CODE			Haul No.						
Quantity*		Units		Presentation		Type	D	% NFD	

Len.	Species:	Tot.	Len.	Species:	Tot.	Len.	Species:	Tot.
0			0			0		
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
0			0			0		
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
0			0			Len.	Species:	
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
0			0			Len.	Species:	
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
0			0			Len.	Species:	
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
0			0			Breakdown of Non Fish Discards		%
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					

*Example

Quantity	1	Units	Box	Presentation	G	Type	Discards	Grade	u

PRESENTATION refers to the state of the fish, ie. gutted (G) or round (R); TYPE refers to the source of the sample, ie. Discard (D), Landing (L); UNITs - Boxes or KGs

FSS: FAT 4 & 5

(4 & 5) MEASURED ONLY SHEET-Landings

Page no.

CRUISE CODE ____ **Haul No.** ____

Quantity* ____ **Units** ____ **Presentation** ____ **Type** L **Grade** ____

Len.	Species:	Tot.	Len.	Species:	Tot.	Len.	Species:	Tot.
0			0			0		
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
0			0			0		
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
0			0			Len.	Species:	
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
0			0			Len.	Species:	
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
0			0			Len.	Species:	
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
0			0					
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					

***Example**

Quantity	1	Units	Box	Presentation	G	Type	Discards	Grade	u

PRESENTATION refers to the state of the fish, ie. gutted (G) or round (R); TYPE refers to the source of the sample, ie. Discard (D), Landing (L); UNITs - Boxes or KGs

FSS: FAT 4 & 5

Cruise Code	/ / /	Date	/ /	Please √ appropriate box	Page No.	

		Species		Carapace Length	Sex		Eggs			Retained		Below MLS		V notch		Tagged		Carapace Damaged				Shell Condition		
	Haul	[redacted]	[redacted]	mm	F	M	Yes	No	Stage*	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	No. limbs missing	No. claws missing	Clean (no settlement on shell)	Minor Fouling (some organisms settled)	Heavy Fouling (>30% settelment)
e.g.	1	√		116	√		√		3	√								√		2	1	√		
e.g.	1		√	127		√					√		√	√					√				√	

*Lobster Egg	Stage 1 = Eggs all black	Stage 3 = Eyed eggs (black spot visible)	H= Hatched (remnants of eggs left post spawning)
	Stage 2 = Some eggs have light half	Stage 4 = Eggs are brown	

(4 & 5) MEASURED ONLY SHEET-Damage Discards

Page No.

CRUISE CODE		Haul No.		Type	Seal Damage		
Quantity*		Units		Presentation		Invertebrate Damage	

Len.	Species:	Tot.	Len.	Species:	Tot.	Len.	Count of damaged fish	Tot.
0			0					
1			1				e.g. Cod heads	7
2			2				Cod Tails	3
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
0			0					
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
0			0			Len.	Species:	
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
0			0			Len.	Species:	
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					
0			0			Len.	Species:	
1			1					
2			2					
3			3					
4			4					
5			5					
6			6					
7			7					
8			8					
9			9					

Comments				

*Example

Quantity	1	Units	Box	Presentation	G	Type	Discards	Grade	U

PRESENTATION refers to the state of the fish, ie. gutted (G) or round (R); TYPE refers to the source of the sample, ie. Discard (D), Landing (L); UNITs - Boxes or KGs

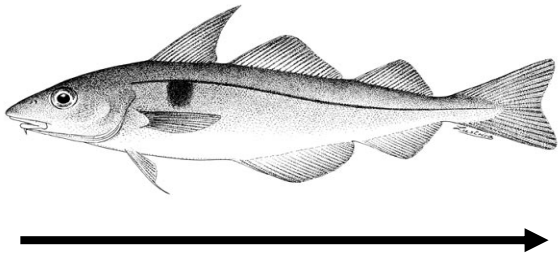
FSS: FAT 4 & 5

APPENDIX 6

Measurement protocol for Fish, Skates, Rays, Squid, *Nephrops* (Prawns) and Brown Crab.

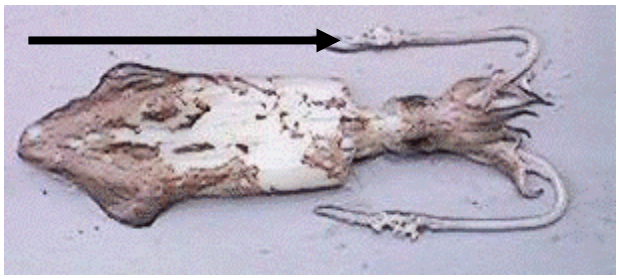
Demersal, Rays, Skate and Pelagic: Total Length

- Measurements are taken from the tip of the nose to the end of the tail.
- **Demersal Fish, Rays and Skates** : total length to the nearest cm below, i.e. 31.2 cm is recorded as 31cm, 35.7 is recorded as 35cm
- **Pelagic Fish**: Total length to the nearest cm below, except for **Herring, Sprat and Boarfish** which are to the nearest ½ cm below, i.e. sprat 15.4cm is recorded as 15cm, sprat 16.7cm is recorded as 16.5cm



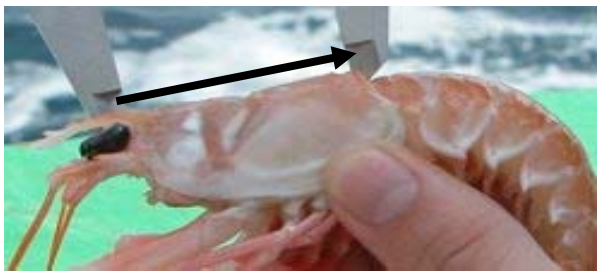
Squid: Mantle length

- Measurements are taken along the length of the mantle and are recorded to the nearest cm below



***Nephrops;* Carapace Length. Brown Crab: Carapace Width**

- ***Nephrops***: Measurements are taken from the back of the eye socket to the back of the carapace using the calipers, measurements are noted to the nearest mm below. i.e 31.7 mm is recorded as 31mm



- **Brown Crab**: Measurements taken across the widest part of the shell to the nearest mm below

APPENDIX 7

MEASUREMENT PROTOCOL FOR DEEPWATER SPECIES

Due to the great variety of body shapes of deep - water fish species and the fragility of their tails and fins some species are not measured to total length.
The majority of species encountered during the deepwater surveys are measured to the centimetre below using total length as the length qualifier **(TL)** (see diagram directly above). There are however some exceptions. Listed below are the species groupings that are not measured using total length complete with details of the length measurement collected for each.

Smoothheads and Searsids (Alepocephalidae and Searsidae)

SL - Standard Length. Measurement taken from the tip of snout/anterior point of head to the end of the fleshy caudal peduncle. Not to be confused with TL which includes the caudal fin rays. All smoothheads and searsids are measured to the nearest whole cm below.

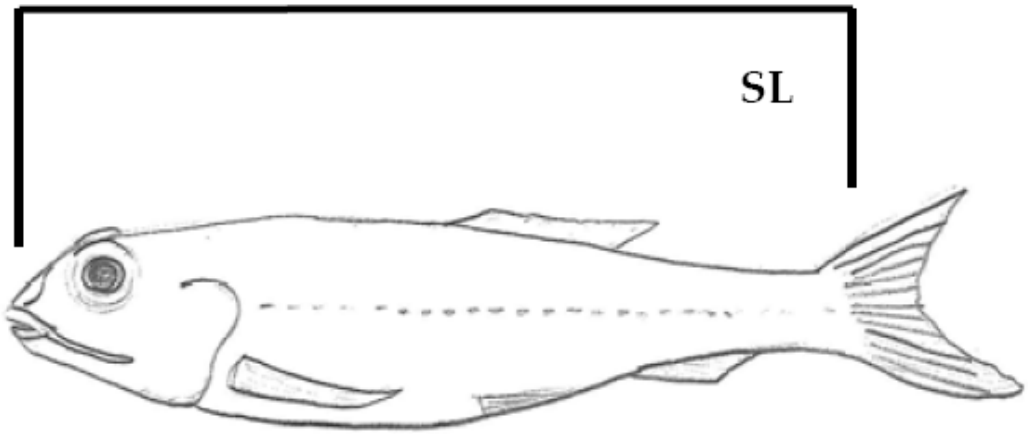


Figure 3.3.1. Measurement of Searsids and Alepocephalidae fishes

Grenadiers (Macrouridae) - PAFL – Pre Anal Fin Length

Measurement taken from the tip of the snout to the first anal fin ray. (See diagram below). All grenadiers are measured to the nearest 0.5 cm below.

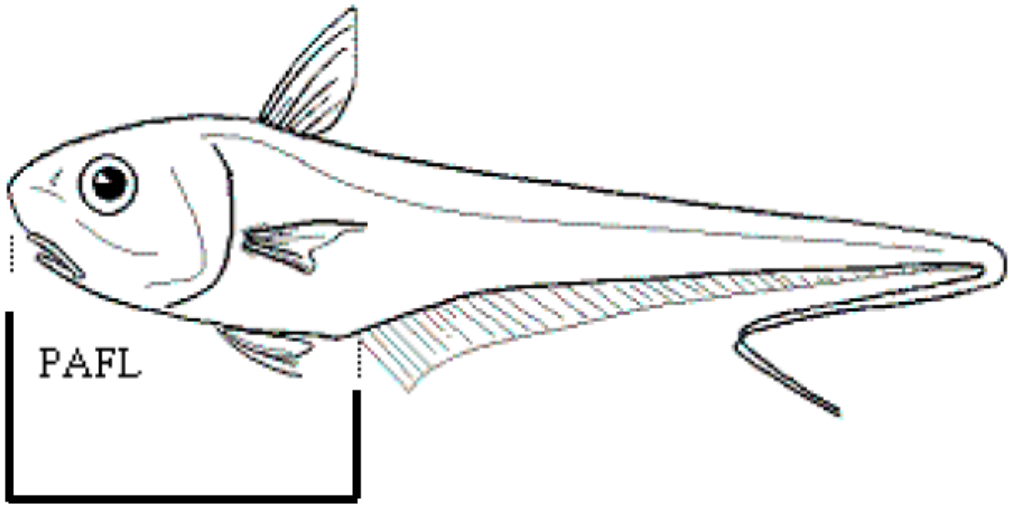


Figure 3.3.2. Measurement of grenadiers (Macrourid fish)

Chimaeridae (Rabbitfish) – PSCFL – Pre Supra Caudal Fin Length

Applies to all **Rabbitfish** except Rhinochimaeridae. (See diagram below). Measured from the tip of the snout to the point just before the start of the supra caudal fin.

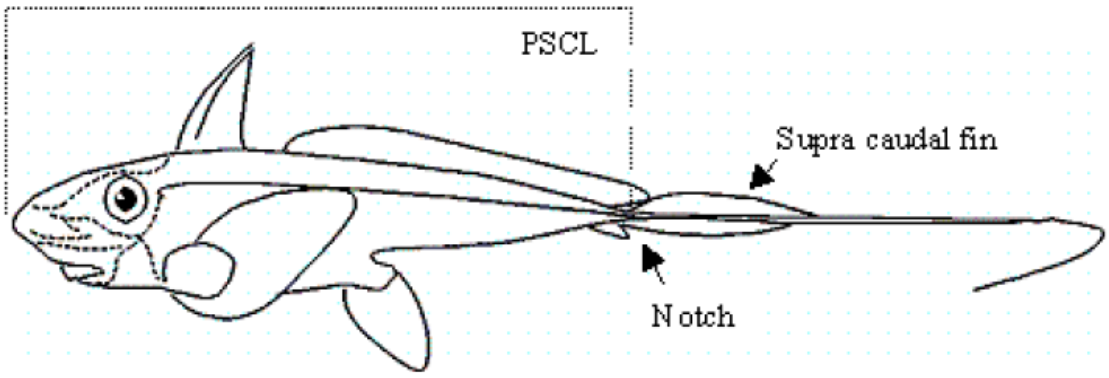


Figure 3.3.3. Measurement of rabbitfish (except Rhinochimarids)

APPENDIX 8

Sexing Elasmobranchs (Sharks, Rays & Skates)

All elasmobranchs, unlike bony fish, practice internal fertilization when reproducing. Therefore they occur as either male or female. Female sharks have no obvious external reproductive structures, whilst males have two extensions of the pelvic fin known as claspers. These claspers are used by males during reproduction to internally fertilise the female sharks.

Male shark with claspers clearly visible extending behind the pelvic fins. See footnote regarding juveniles.

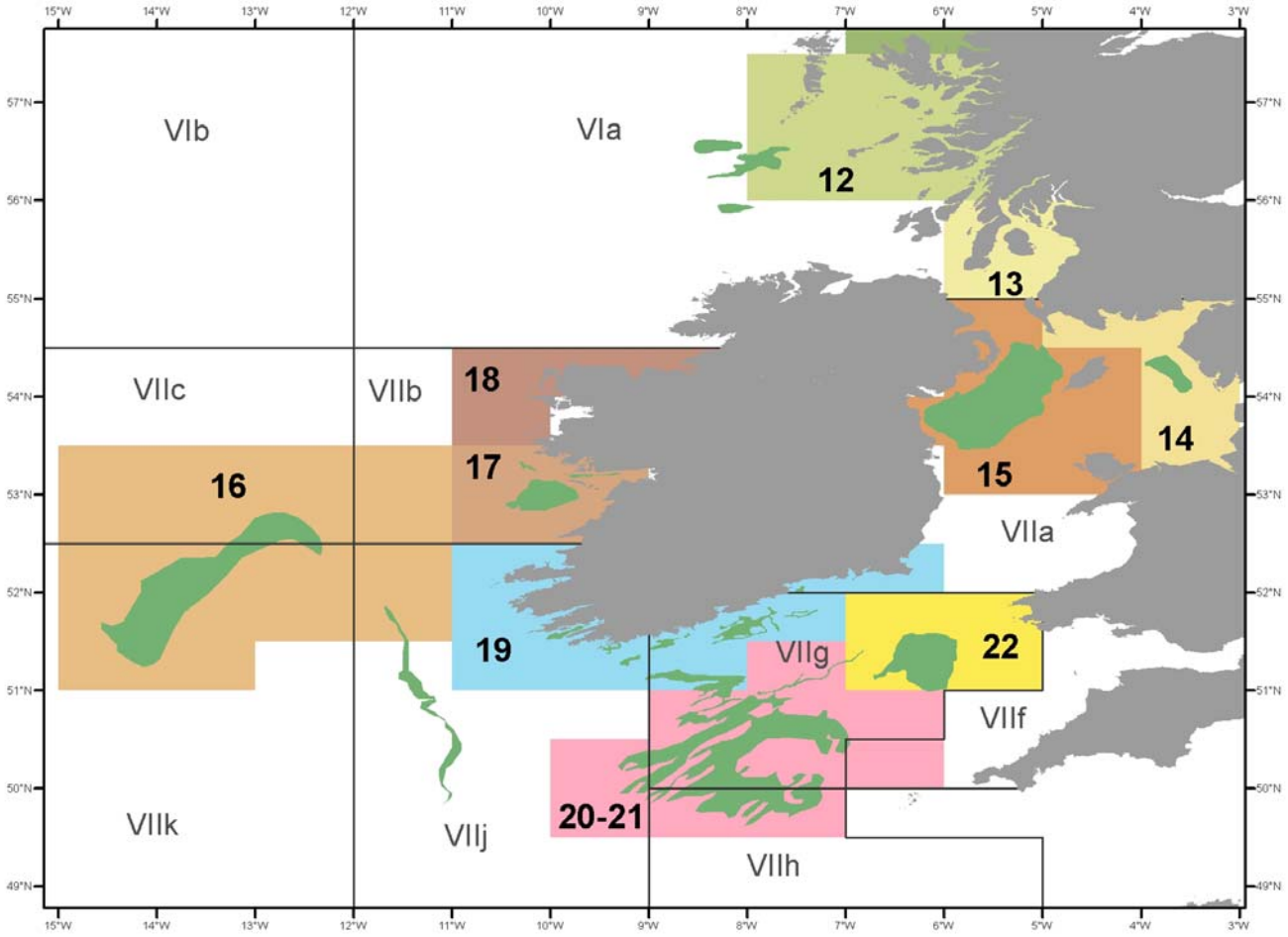
Female shark with lack of obvious external reproductive structures.

Care needs to be taken when sexing juvenile elasmobranchs as the claspers will be very small and easily missed, particularly with very small dogfish where it is necessary to gently part the pelvic fins to check for the presence of small claspers.

Sexing Megrim

APPENDIX 9

Map of Functional Units for *Nephrops* fishing grounds



6

THE LANDINGS OBLIGATION

The landing obligation for demersal fisheries will be introduced on a phased basis from 1 January 2016 for species that define the fisheries, and from 1 January 2019 at the latest for all other species, in:-

- Fisheries for Norway lobster (*Nephrops*)
- Fisheries for hake
- Fisheries for cod, haddock, whiting and saithe
- Fisheries for common sole and plaice
- Other fisheries for species subject to catch limits.

Unlike pelagic species, which became subject to the Landing Obligation in January 2015, the CFP allows for a degree of phasing-in for demersal stocks between 2016 and 2019, by which time all species subject to TAC limits (or minimum size limits in the case of the Mediterranean) will be incorporated. Note that the landing obligation will not apply to other non-TAC species in Western Waters. Once a stock falls under the landing obligation, all catches must be landed and counted against quota. Catches of fish below minimum size (now known as Minimum Conservation Reference Size – MCRS) cannot be sold for direct human consumption, but may be sold for other purposes such as bait or fish meal but are still deducted from quota. Here the intention is to discourage the catches of such fish in the first instance through improved selectivity or avoidance.

In recognition that all catches must be landed, quotas will be "topped-up" taking into account previous levels of discards. How this "top-up" or "uplift" will be calculated is still being discussed, but ultimately quotas will still need to adhere to MSY catch advice.

The Landing Obligation is implemented through discard plans developed through joint recommendations which have been agreed by groups of Member States from the same region or sea basin. While the species and fisheries covered must be identified in the Demersal discard plans, the plans may also include a number of other aspects:

- specific provisions on fisheries or species covered by the landing obligation;
- specification of exemptions to the landing obligation if fisheries or species meet certain criteria related to high survivability;
- provisions for *de minimis* exemptions;
- provisions on documentation of catches, and;
- the fixing of minimum conservation reference sizes (MCRS).

The process for deciding which fisheries and stocks to be introduced in 2016 has been much more complex than experienced with pelagic fisheries. For the demersal fisheries in North Western Waters, the joint recommendation has been developed by all member states with an interest in demersal fisheries in the area: Ireland, France, Spain, UK, the Netherlands and Belgium. This has involved a series of consultations and meetings between senior civil servants with responsibility for fisheries policy: the Director Generals North Western Waters (NWW) Group, which in turn has been supported by a technical group comprised of senior administrators and scientists from each of the member states. In addition, the CFP also requires that the Member States groups must also consult the Advisory Councils, in this case the NWW Advisory Council, so that the views of key constituent stakeholders could be taken into consideration in the development of the demersal discard plan. At a national level, stakeholder consultations are undertaken through the Discard Implementation Group which comprises of the main Producer Organisations, the processing sector, fish selling cooperatives, DAFM, SFPA, BIM and the MI.

Within the Western Waters Region, the Member States Group (NWW High Level Group) has opted to include *Nephrops*, haddock, whiting, black sole, and hake in 2016. However, the obligation to land any of these is dependent on area and fishery. The group defined fisheries based on certain thresholds which have been based on historic track record of landings during the reference period 2013/2014. For example, if individual vessels landings comprised more than 30% *Nephrops* in 2013/2014, then they will be obliged to land all catches of *Nephrops* in all areas from 2016 and beyond. Similarly, if vessel landings comprised of more than 25% cod, haddock, whiting and saithe during the reference period, then they will be obliged to land whiting when operating in the Celtic Sea. In the Irish Sea and West of Scotland, vessels must land all haddock if their landings of cod, haddock, whiting and saithe exceeded 10% in the reference period. In practice, almost all vessels fall into one individual category and within these, over 90% of the fleet will meet the required thresholds. DAFM are in the process of notifying individual operators of which category they belong to and what their obligations will be in 2016. While hake and black sole

are also included in the plan, these species are not likely to impact on the Irish fleet in 2016 due to the gear and thresholds specified in the draft discard plans (see appendix VII for the specific details on the stocks, fleets and thresholds).

Much of the work of the regional group in developing the demersal discard plan has been focussed around the specific flexibilities and in particular the definition of the fisheries; exemptions on high survivability and de minimis exemptions. The CFP allows for exemptions where "*species for which scientific evidence demonstrates high survival rates, taking into account the characteristics of the gear, of the fishing practices and of the ecosystem*" and allows for continued discarding "*of up to 5 % of total annual catches of all species subject to the landing obligation*", the so called *de minimis* provisions. The *de minimis* provisions are permitted when (i) "*where scientific evidence indicates that increases in selectivity are very difficult to achieve*" or (ii) "to *avoid disproportionate costs of handling unwanted catches, for those fishing gears where unwanted catches per fishing gear do not represent more than a certain percentage, to be established in a plan, of total annual catch of that gear*".

The delegated act for demersal fisheries is currently being drafted by the European Commission and this will be published before the end of 2015. The agreed plan contains a number of elements and flexibilities that are available in various fisheries. These are as follows:

- A maximum of 3% for years one (2016), two (2017) and three (2018) for common sole of the total annual catches of this species by vessels using trammel and gill nets to catch common sole in the Channel (ICES Areas VIId, e, f and g)
- A maximum of 3% for years one (2016), two (2017) and three (2018)) for common sole of the total annual catches of this species by vessels using gear with increased selectivity in the Channel (ICES Areas VIId and e) and the Celtic Sea (VIIf and g)
- A maximum of 7% for years one (2016) and two (2017), and 6% for year three (2018) for whiting of the total annual catches of this species by vessels using bottom trawls < 100 mm to catch whiting in the Channel (ICES Area VIId and e)
- A maximum of 7% for years one (2016) and two (2017), and 6% for year three (2018) for whiting of the total annual catches of this species by vessels using bottom trawls ≥ 100 mm to catch whiting in the Celtic Sea and the Channel (ICES Areas VIIb-j)
- A maximum of 7% for years one (2016) and two (2017), and 6% for year three (2018) for whiting of the total annual catches of this species by vessels using bottom trawls < 100mm to catch whiting in the Celtic Sea (ICES Area VII (excluding VIIa, d and e)
- A maximum of 7% for years one (2016) and two (2017), and 6% for year three (2018) for Norway lobster (*Nephrops*) of the total annual catches of this species by vessels obliged to land Norway lobster (*Nephrops*) in ICES Area VII
- A maximum of 7% for years one (2016) and two (2017), and 6% for year three (2018) for Norway lobster (*Nephrops*) of the total annual catches of this species by vessels obliged to land Norway lobster (*Nephrops*) in ICES Area VIa

In addition, the plan also allows for permitted discarding of *Nephrops* based on high survivability, but this is only applicable to fisheries using pots and creels in area VIa and VII.

In due course, the NWW Group will be submitting further Joint Recommendations for the adaptation of the North Western Waters discard plan. In addition to the inclusion of additional species, the Group may also include further exemptions under high survival and de minimis, specific provisions on Minimum Conservation Reference Size (MCRS) or control measures.

Tables a) – i) outline the fisheries that will be subject to the Landings Obligation in 2017.

a) Fisheries in Union and International waters of ICES subarea VI and division Vb

Fishery	Gear Code	Fishing gear description	Mesh Size	Landing Obligation

Cod (*Gadus morhua*), Haddock (*Melanogrammus aeglefinus*), Whiting (*Merlangius merlangus*) and Saithe (*Pollachius virens*)	OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, OTM, PTM, TB, SX, SV, OT, PT, TX	Trawls & Seines	All	Where total landings per vessel of all species in 2014 and 2015[1] consist of more than 5% of the following gadoids: cod, haddock, whiting and saithe combined, the landing obligation shall apply to **haddock and by-catch of sole, plaice and megrims**.
Norway lobster (*Nephrops norvegicus*)	OTB, SSC, OTT, PTB, SDN, SPR, FPO, TBN, TB, TBS, OTM, PTM, SX, SV, FIX, OT, PT, TX	Trawls, Seines, Pots, Traps & Creels	All	Where the total landings per vessel of all species in 2014 and 2015[2] consist of more than 20% of Norway lobster, the landing obligation shall apply to **Norway lobster and by-catch of haddock**.

[1] Any vessels listed for 2016 remain on such list, whatever the percentage for the period 2014-2015.

[2] Any vessels listed for 2016 remain on such list, whatever the percentage for the period 2014-2015.

b) Fisheries for hake and fisheries for megrims, with TAC for ICES subareas VI and VII and Union and International waters of ICES division Vb

Fishery	Gear Code	Fishing gear description	Mesh Size	Landing Obligation
Hake (*Merluccius merluccius*)	OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, OTM, PTM, TB, SX, SV, OT, PT, TX	Trawls & Seines	All	Where the total landings per vessel of all species in 2014 and 2015[1] consist of more than 20% of hake, the landing obligation shall apply to **hake**.
Hake (*Merluccius merluccius*)	GNS, GN, GND, GNC, GTN, GTR, GEN	All Gill Nets	All	All catches of **hake** shall be subject to the landing obligation.
Hake (*Merluccius merluccius*)	LL, LLS, LLD, LX, LTL, LHP, LHM	All Long lines	All	All catches of **hake** shall be subject to the landing obligation.
Megrims (*Lepidorhombus spp.*)	OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, OTM, PTM, TB, SX, SV, OT, PT, TX	Trawls & Seines	<100 mm	Where the total landings per vessel of all species in 2014 and 2015 consist of more than 20% of megrims, the landing obligation shall apply to **megrims**.

c) Fisheries with TAC covering ICES subarea VII for Norway lobster

Fishery	Gear Code	Fishing gear description	Mesh Size	Landing Obligation
Norway lobster (*Nephrops norvegicus*)	OTB SSC, OTT, PTB, SDN, SPR, FPO, TBN, TB, TBS, OTM, PTM, SX, SV, FIX, OT, PT, TX	Trawls, Seines, Pots, Traps & Creels	All	Where the total landings per vessel of all species in 2014 and 2015[2] consist of more than 20% of Norway lobster, the landing obligation shall apply to **Norway lobster**.

[1] Any vessels listed for 2016 remain on such list, whatever the percentage for the period 2014-2015.

[2] Any vessels listed for 2016 remain on such list, whatever the percentage for the period 2014-2015.

d) Fisheries in ICES division VIIa

Fishery	Gear Code	Fishing gear	Mesh Size	Landing Obligation
Cod (*Gadus morhua*), Haddock (*Melanogrammus aeglefinus*), Whiting (*Merlangius merlangus*) and Saithe (*Pollachius virens*)	OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, OTM, PTM, TB, SX, SV, OT, PT, TX	Trawls & Seines	All	All catches of haddock shall be subject to the landing obligation. Where total landings per vessel of all species in 2014 and 2015[1] consist of more than 10% of the following gadoids: cod, haddock, whiting and saithe combined, the landing obligation shall apply to **haddock**.

e) Fisheries in ICES division VIId

Fishery	Gear Code	Fishing gear	Mesh Size	Landing Obligation
Common Sole (*Solea solea*)	TBB	All Beam trawls	All	All catches of **common sole** are subject to the landing obligation.
Common Sole (*Solea solea*)	OTT, OTB, TBS, TBN, TB, PTB, OT, PT, TX	Trawls	<100 mm	Where the total landings per vessel of all species in 2014 and 2015[2] consist of more than 5% of common sole, the landing obligation shall apply to **common sole**.
Common Sole (*Solea solea*)	GNS, GN, GND, GNC, GTN, GTR, GEN	All Trammel nets & Gill nets	All	All catches of **common sole** shall be subject to the landing obligation.

[1] Any vessels listed for 2016 remain on such list, whatever the percentage for the period 2014-2015.

[2] Any vessels listed for 2016 remain on such list, whatever the percentage for the period 2014-2015.

Fishery	Gear Code	Fishing gear	Mesh Size	Landing Obligation
Cod (*Gadus morhua*), Haddock (*Melanogrammus aeglefinus*), Whiting (*Merlangius merlangus*) and Saithe (*Pollachius virens*)	OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, OTM, PTM, TB, SX, SV, OT, PT, TX	Trawls and Seines	All	Where the total landings per vessel of all species in 2014 and 2015[1] consist of more than 20%[2] of the following gadoids: cod, haddock, whiting and saithe combined, the landing obligation shall apply to **whiting**.

f) Fisheries in ICES division VIIe for common sole

Fishery	Gear Code	Fishing gear	Mesh Size	Landing Obligation
Common Sole (*Solea solea*)	TBB	All Beam trawls	All	Where the total landings per vessel of all species in 2014 and 2015[3] consist of more than 5%[4] of common sole, the landing obligation shall apply to **common sole**.
Common Sole (*Solea solea*)	GNS, GN, GND, GNC, GTN, GTR, GEN	All Trammel nets & Gill nets	All	All catches of **common sole** shall be subject to the landing obligation.

g) Fisheries in ICES divisions VIId and VIIe for pollack

Fishery	Gear Code	Fishing gear	Mesh Size	Landing Obligation
Pollack (*Pollachius pollachius*)	GNS, GN, GND, GNC, GTN, GTR, GEN	All Trammel nets & Gill nets	All	All catches of **pollack** shall be subject to the landing obligation.

[1] Any vessels listed for 2016 remain on such list, whatever the percentage for the period 2014-2015.

[2] 20% only if continuation of whiting *de minimis* exemptions in 2017; 25% otherwise

[3] Any vessels listed for 2016 remain on such list, whatever the percentage for the period 2014-2015.

[4] 5% only if clarification and sufficient resolution between EU institutions on implications of the Sole Recovery Management Plan in VIIe (Council Regulation (EC) No. 509/2007) is achieved especially with regard to inter- annual TAC restraint and Fmsy value used within the management plan; 10% otherwise. The NWW regional group will review the Commission position on this Sole Recovery Management Plan and confirm which catch threshold will be used in 2017.

h) Fisheries in ICES divisions VIIb, VIIc and VIIf – VIIk

Fishery	Gear Code	Fishing gear	Mesh Size	Landing Obligation
Common Sole (*Solea solea*)	TBB	All Beam trawls	All	Where the total landings per vessel of all species in 2014 and 2015[1] consist of more than 5% of common sole, the landing obligation shall apply to **common sole**.
Common Sole (*Solea solea*)	GNS, GN, GND, GNC, GTN, GTR, GEN	All Trammel nets & Gill nets	All	All catches of **common sole** shall be subject to the landing obligation.

i) Fisheries in ICES divisions VIIb, VIIc, VIIe and VIIf – VIIk

Fishery	Gear Code	Fishing gear	Mesh Size	Landing Obligation
Cod (*Gadus morhua*), Haddock (*Melanogrammus aeglefinus*), Whiting (*Merlangius merlangus*) and Saithe (*Pollachius virens*)	OTB, SSC, OTT, PTB, SDN, SPR, TBN, TBS, OTM, PTM, TB, SX, SV, OT, PT, TX	Trawls & Seines	All	Where the total landings per vessel of all species in 2014 and 2015[2] consist of more than 20%[3] of the following gadoids: cod, haddock, whiting and saithe combined, the landing obligation shall apply to **whiting**.

Note: **See Gear Code Acronym Table below**

[1] Any vessels listed for 2016 remain on such list, whatever the percentage for the period 2014-2015.

[2] Any vessels listed for 2016 remain on such list, whatever the percentage for the period 2014-2015.

[3] 20% only if continuation of whiting *de minimis* exemptions in 2017; 25% otherwise

Gear Code Acronym Table

Gear Code	Type of gear
OTB	Bottom Otter Trawl
OTT	Otter Twin Trawls
OT	Otter Trawls (Not Specified)
PTB	Bottom Pair Trawl
PT	Pair Trawls (Not Specified)
TBN	Nephrops Trawl
TBS	Shrimp Trawl
TX	Other Trawls (Not Specified)
SDN	Danish Anchor Seine
SSC	Scottish Seine (Fly Dragging)
SPR	Scottish Pair Seine (Fly Dragging)
TB	Bottom Trawls (Not Specified)
SX	Seine Nets (Not Specified)
SV	Boat or Vessel Seine
TBB	Beam Trawl
GN	Gillnets (Not Specified)
GNS	Gillnets Anchored (Set)
GND	Gillnets (Drift)
GNC	Gillnets (Circling)
GTN	Combined Gillnets-Trammel Nets
GTR	Trammel Net
GEN	Gillnets and Entangling Nets (Not Specified)
LLS	Set Longlines
LLD	Drifting Longlines
LL	Longlines Not Specified
LTL	Trolling Lines
LX	Hooks and Lines (not specified)
LHP	Handlines and Pole Lines (Hand Operated)
LHM	Handlines and Pole Lines (Mechanised)
FPO	Pots
FIX	Traps (Not Specified)