



Discards monitoring in the Gillnet Sole Fishery

Authors: Floor Quirijns, Bram Couperus and Edwin van Helmond (IMARES, part of Wageningen UR)

The Gillnet Sole Fishery Study Group started discards monitoring. Data were supposed to be collected in three different ways:

1. Self-sampling
2. Catch monitoring by means of onboard cameras (CCTV)
3. Monitoring under the Data Collection Regulation

Self-sampling

In September and October 2011, two fishermen sampled their catch during in total ten fishing trips (see the protocol – in Dutch – in Annex 1). The trips were carried out in ICES rectangles 33F3 and 33F4.

In each fishing session, the fishers counted discards by species in three 100 meter-segments: in the beginning, middle and end of the net. The numbers of discards by species were registered on EU logbook forms, where also total landings by trip were registered. The EU logbook forms were sent to IMARES, where the data were processed.

The results of the analyses are presented in Table 1, Figure 1 and Annex 2. The discards presented in Table 1 are total number by species by trip. In Figure 1 and Annex 2, discards are converted to numbers by hour and 1000 meters of net. For conversion, information on total net length, sampled net length and soaking time were required. In one trip, the soaking time was missing and therefor estimated based on start and end time of the trip and fishing location.

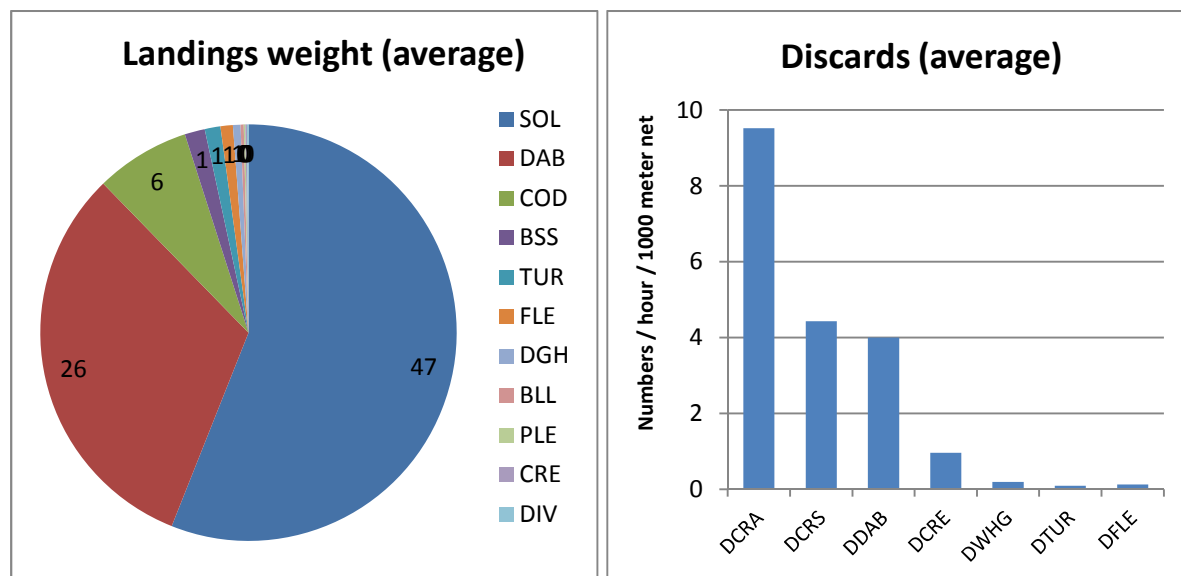
There is a lot of variation in catch composition and in discard rates between the ten sampled trips. Even more variation is expected if sampling would be carried out throughout the fishing season by more vessels over a larger area. In this specific sample of trips, the most abundant discarded species are Green shore crab (*Carcinus maenas*, *Strandkrab*), Flying crab (*Liocarcinus holsatus*, *Zwemkrab*) and Dab (*Limanda limanda*, *Schar*). These species were caught in 80% of the trips or more. Other species, discarded in $\leq 50\%$ of the trips, are Edible crab (*Cancer pagurus*, *Noordzeekrab*), Whiting (*Merlangius merlangus*, *Wijting*), Turbot (*Scophthalmus maximus*, *Tarbot*) and Flounder (*Platichthys flesus*, *Bot*). (See Table 1 and Figure 1.)



Table 1. Total landings by trip and amount of discards by species. The discard values are converted from sampled numbers to total numbers by trip. The conversion factor equals total net length divided by the sampled net length.

Ship	Date	Landings (kg) Total	Discards by species (numbers)						
			Green shore crab	Flying crab	Edible crab	Dab	Whiting	Turbot	Flounder
Ship 1	9/24/2011	30	0	67	0	100	0	0	0
Ship 2	9/24/2011	52	0	0	90	60	0	0	0
Ship 2	9/25/2011	82	450	510	0	90	0	0	0
Ship 2	10/2/2011	78	480	0	390	210	30	0	0
Ship 2	10/3/2011	67	510	210	60	270	30	0	0
Ship 2	10/14/2011	143	1110	510	30	510	0	15	0
Ship 2	10/15/2011	103	690	360	30	720	0	0	0
Ship 2	10/16/2011	25	1080	270	0	150	0	0	0
Ship 2	10/22/2011	180	510	450	0	240	60	0	40
Ship 2	10/23/2011	70	240	180	0	90	0	0	0
TOTAL	n=10	830	5070	2557	600	2440	120	15	40

Figure 1. Average landings composition (left) and average amount of discards by species (right). Based on 10 fishing trips in September and October 2011. Landings species: SOL=sole, DAB=dab, COD=cod, BSS=sea bass, TUR=turbot, FLE=flounder, DGH=dogfish, BLL=brill, PLE=plaice, CRE=edible crab, DIV=various. Discards species: DCRA=green shore crab, DCRS=flying crab, DDAB=dab, DCRE=edible crab, DWHG=whiting, DTUR=turbot, DFLE=flounder).

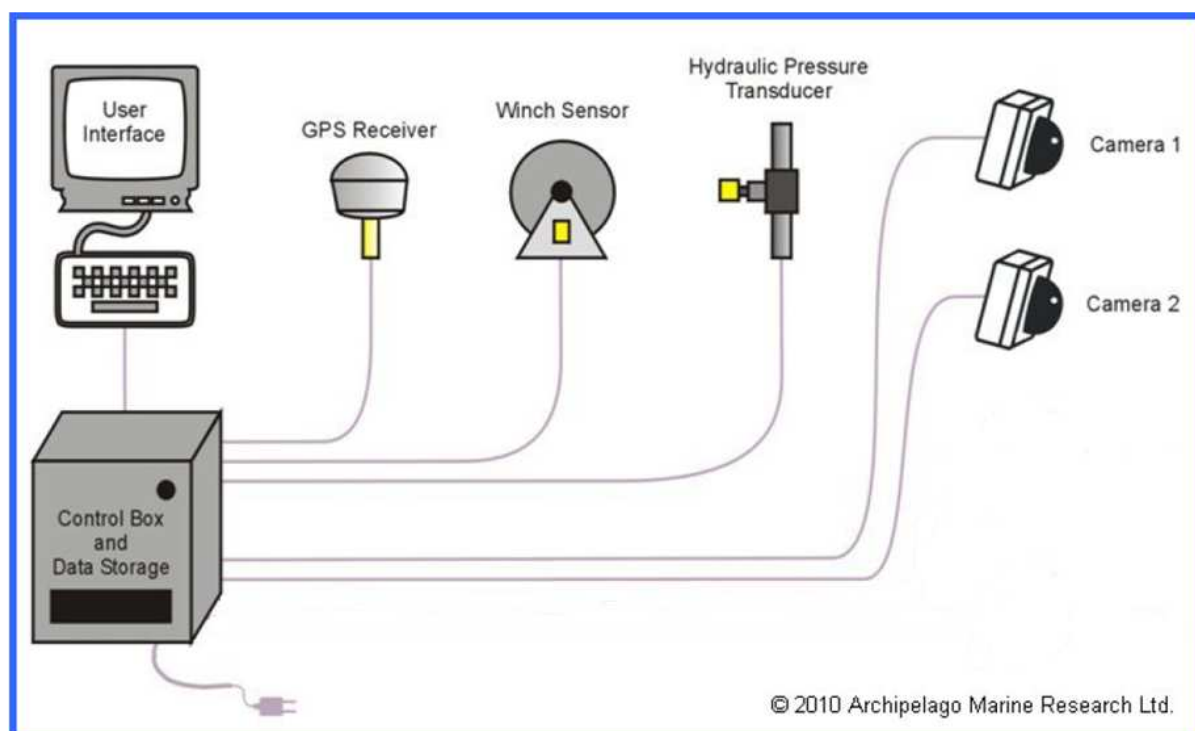




Onboard cameras

On several Dutch vessels an Electronic Monitoring (EM) system is installed. This EM system consists of a GPS, hydraulic pressure sensor and an photoelectric winch sensor. The vessels are also equipped with two waterproof dome Closed Circuit TeleVision (CCTV) cameras (Figure 2). One camera provides a view on the area where the net comes out of the water during hauling. Another camera is aimed right behind the hauling device where the fish is handled. The sensors and cameras are connected to a control box. Once the system is powered by the skipper data from the sensors are stored. Storage of CCTV data is activated immediately after the skippers starts the hydraulic system.

Figure 2. Schematic overview of Closed Circuit TeleVision (CCTV).



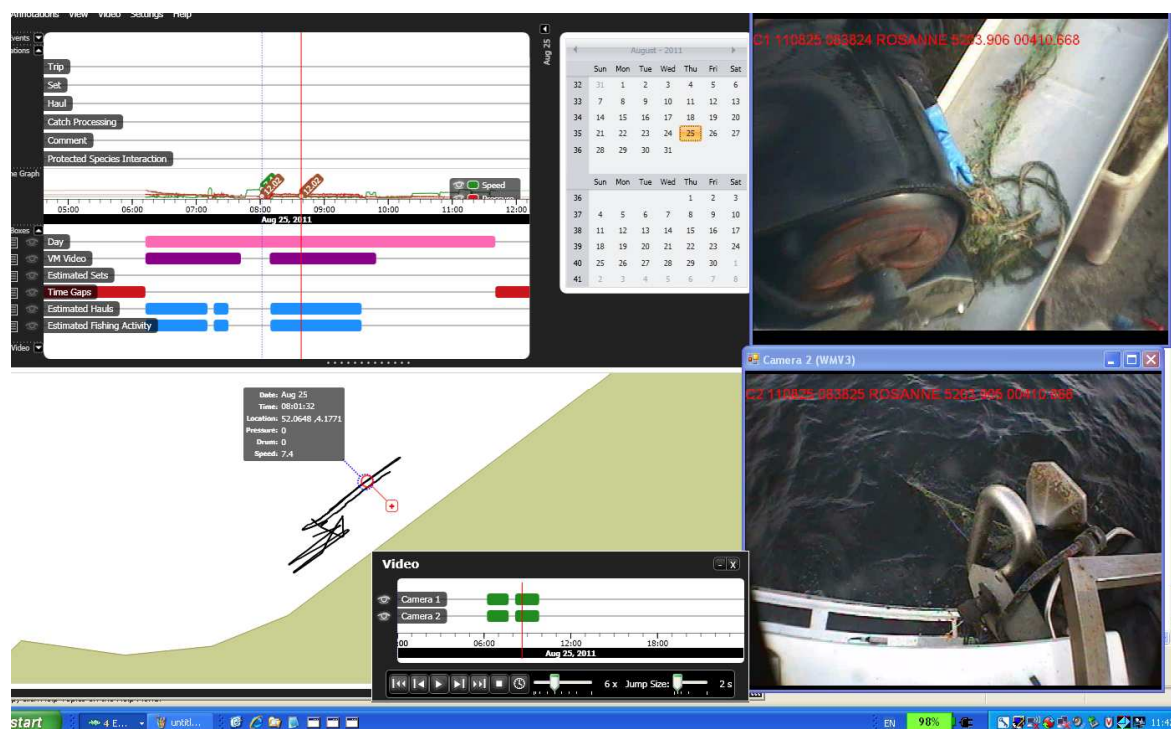
In the Dutch gill net fishery, the EM system was installed on one vessel from 10 December 2010 onwards. At the start of the project it was agreed to monitor trammel net fishery for Cod and Turbot & Brill (approximate season end November – April) and to remove the system by the 1st of May. However, the skipper offered to keep the system running until the end of the year to collect data on Sole and Sea bass fishery as well.

Eventually, data were collected from six Sole fishing days out of the 46 days he spent fishing for Sole (i.e. 13% of his Sole targeting trips were monitored). Three days in Spring were sampled (April 3, 8 and 11) and three days in Summer (July 27 and August 18 and 25). The gear used during the Sole targeted trips was a Sole net of 6000 – 10000m, with mesh sizes ranging from 92 to 120 mm.

In a quick scan of the footage from the six days the numbers by species were counted. Flatfish were grouped and not counted by species: in the Spring footage all flatfish were grouped except Turbot and Brill and in the Summer footage also Sole was counted separately. No distinction was made between marketable and undersized specimen.



Figure 3. Printscreen from the software used to analyse EM data.



Catch data, in numbers, were estimated from the footage of the six gillnet fishing trips. The results are presented in Annex 3. Due to technical limitations of the EM system, presented numbers are most likely an underestimation of the total catch. Accompanying landings data, in weight, are retrieved from logbook data which summarise landings by trip.

At present there is no funding to continue EM on gill net cutters in 2012. The system that is currently running will be removed at the end of December 2011.

Data Collection Framework

No observer trips in the Dutch Sole Gillnet Fishing have taken place under the EU data collection framework (DCF). Under the DCF The Netherlands are obliged to sample ten gill net fishing trips. It is not specified which type of gill net fishing trips should be sampled, i.e. no target species is specified. In 2011 observers only went on board gill net trips in which Cod was targeted.

It is recommended that in 2012 also gill net trips in which Sole and Sea bass are targeted are included in the ten DCF sampling trips. From these trips, catch composition and length frequencies by species can be obtained.



Considerations

The results presented in this document give some insight in catch composition and amount of discards in the Dutch Sole Gillnet Fishery. In order to give a more definitive description, more fishermen should sample their catches throughout the fishing season. Preferably fishermen covering the total fishing area should join the self-sampling scheme.

For verification of results from a self-sampling scheme, another data source is required. For the Dutch Sole Gillnet Fishery this data source can either be the onboard cameras (CCTV) or observer trips under the DCF. Therefore it is important that in following years the fishery will be monitored by means of at least one of these two ways.

The vessels in the Dutch Gillnet Fishery are relatively small. This complicates having observers onboard.

In each of the catch sampling schemes described in this document, no distinction was made between dead or alive discards. It is impossible to give an indication of the proportion of discards that survive the fishery. So far, IMARES has the impression that practically all discards are dead.



Annex 1. Protocol self-sampling

A. Meeldijk, B. Couperus en M. Kraan - september 2011

Aanleiding

Een vereiste in het kader van het voeren van het MSC-label is dat de discards bemonsterd wordt teneinde een inschatting te hebben van soorten, voorkomen en omvang per soort van de discards.

Uitgangspunten

De bemonstering mag niet de voortgang van het werk belemmeren. Het protocol moet eenduidig zijn en ook onder uitzonderlijke omstandigheden uit te voeren zijn. Aangezien er in de nettenvisserij op tong veel bijvangst om praktische redenen niet uit het net wordt gehaald, zijn lengtemetingen niet haalbaar. Dit betekent dat voor het berekenen van bijvangstgewichten, gebruik gemaakt moet worden van lengte- en gewicht gegevens van waarnemersreizen. Er zal in de zelfbemonstering dus ook geen onderscheid gemaakt worden tussen maatse en ondermaatse vis. Wellicht kan voor de resterende tijd in 2011, nog gebruik gemaakt worden van waarnemersreizen die al worden uitgevoerd in het kader van de DCR. In ieder geval zal voor het seizoen in 2012 een waarnemersprogramma opgezet worden, waarbij zoveel mogelijk aansluiting gezocht wordt bij / gebruik gemaakt wordt van bestaande waarnemingsreizen in de staandwantvloot.

Aangezien de variatie in de (bij)vangst voorafgaand aan de bemonstering nog niet bekend is, kan er geen vereiste bemonsteringsgraad worden berekend. Een reële bemonsteringsgraad in lopende bijvangstprojecten in het kader van de DCR en EU verordening 812/2004 (bijvangst zeezoogdieren) is 5 tot 10 procent van de vloot activiteit. Een bemonsteringsgraad in deze orde van grote kan bereikt worden, wanneer alle vissende leden van de kenniskring deelnemen in de bemonstering, er van uitgaande dat er binnen deze groep enige uitval zal zijn.

Beschrijving

Het voorstel is om gedurende elk getij dat wordt bevist, van drie stukken net van 100m alle bijvangst te tellen. Indien de bijvangst erg groot is, worden 3 stukken van 50m bemonsterd. De aantallen per soort worden ingevuld in een formulier (zie bijlage). De 3 bemonsterde stukken van 100m (50m) bevinden zich aan het begin, in het midden en aan het eind van een uitgezette reeks. Wanneer een schipper meer dan een reeks heeft uitgezet, wordt aan de schipper overgelaten welke bemonsterd wordt. De keuze tussen wel of niet bemonsteren moet dan wel gemaakt worden voordat gehaald wordt om te voorkomen dat altijd het stuk met de laagste bijvangst gekozen wordt.

Waarnemersreizen

Op dit moment is nog niet bekend wat het protocol is tijdens de waarnemersreizen die zullen worden uitgevoerd. Tijdens deze reizen zullen in elk geval lengtemetingen uitgevoerd moeten worden. Tijdens de waarnemersreizen zal ook getoetst moeten worden of het protocol in ander opzichten voldoet: dekkingsgraad ten opzichte van de vloot, soortsaamenstelling in het formulier, levert 3x100m voldoende gegevens op? Etc.



Protocol zelfbemonstering staand want vloot vissend op tong in het kader van MSC

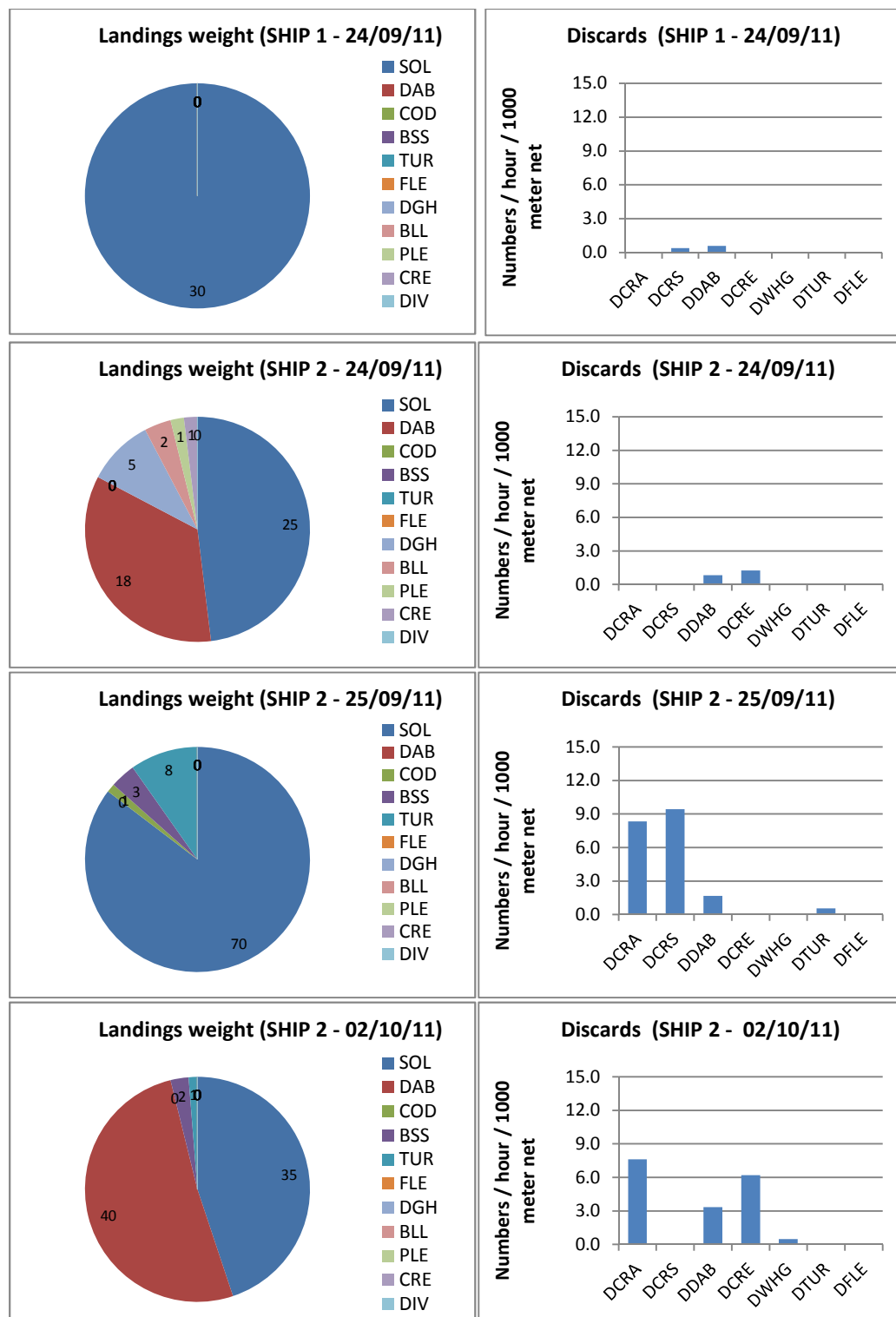
- In de maand september (2011) alle vis-sessies bemonsteren.
- Naast het invullen van de vangst op het logboek, dienen nu ook de discards genoteerd te worden.
- Discards moeten onderscheiden kunnen worden van aan te landen soorten. Dit doen we door voor de soortnaam een **D** op te schrijven. (zie voor de meeste soorten lijst onderaan)
- Discards zijn al die vissen en krabben die de visser normaal overboord zou gooien of in zijn net zou laten zitten, dus ondermaatse commerciële vissen, krabben en vis die wel gevangen is maar niet aangeland wordt.
- Per vis-sessie worden **3 stukken net van 100m** bemonsterd, 1 aan het begin, 1 in het midden en het laatste stuk van het net. Bij het binnenhalen van het net wordt dus meteen bemonsterd.
- Als er zeer veel discards in zitten (bijvoorbeeld omdat er 'in de schar gelopen' is) kan volstaan worden met 3x50 m net te tellen. Als er niet zoveel discards zijn dan 3x100 m net. Dit besluit wordt genomen tijdens het tellen in het eerste stuk net. GEEF DIT DAN AAN MET '50m' BIJ OPMERKINGEN IN HET LOGBOEK. Als dat er niet staat gaan we uit van 100m net.
- De discards moeten niet in kilo's opgeschreven worden maar **in aantallen**. Tel het aantal stuks in het net, turf ze per soort en noteer het totaal aantal stuks op het logboek.
- LET OP: alle interacties met bruinvis moeten ook opgeschreven worden!

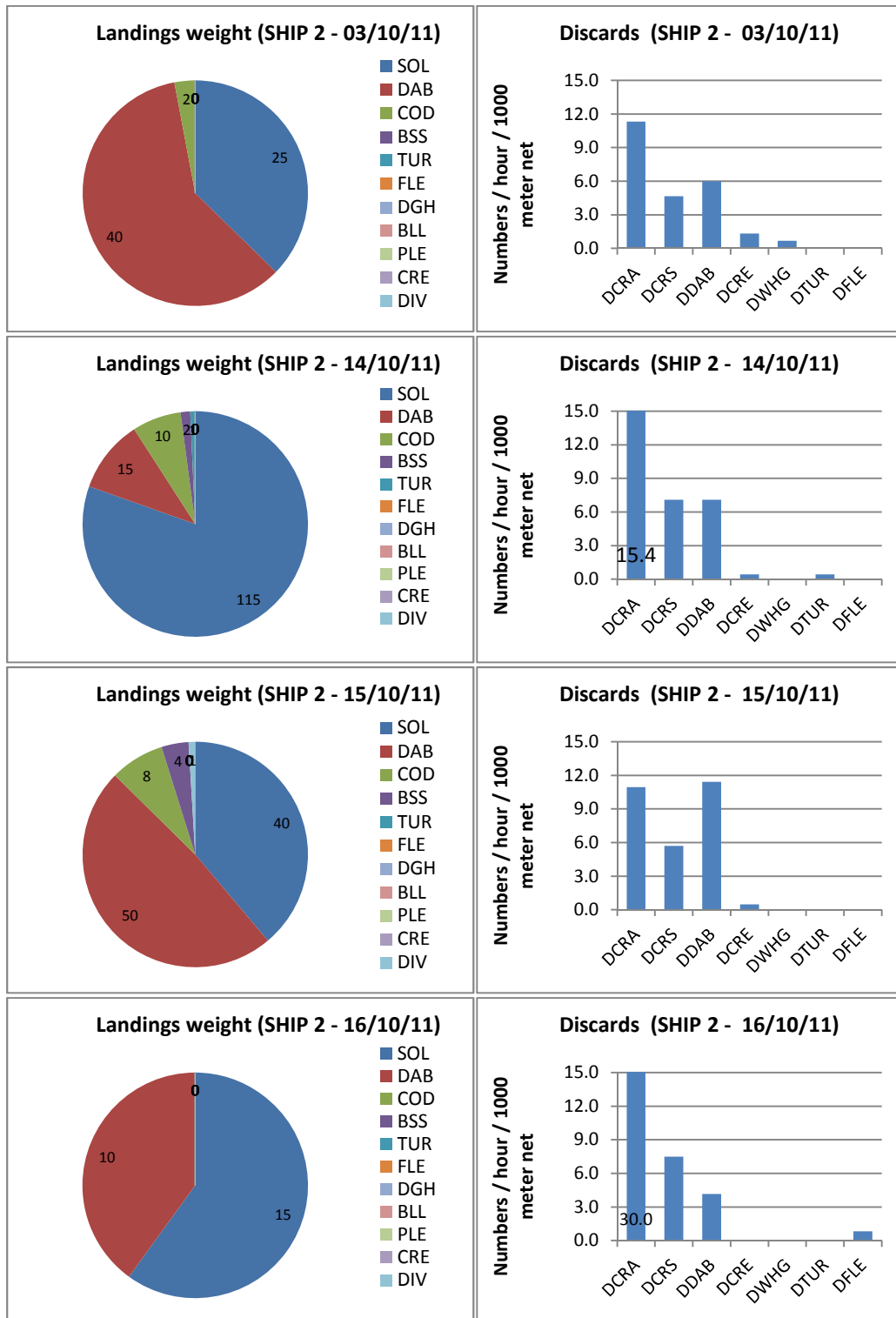
Vis / benthos soort	Code vissoort	Discards
Makreel	MAC	DMAC
Tarbot	TUR	DTUR
Bot	FLE	DFLE
Griet	BLL	DBLL
Tong	SOL	DSOL
Kabeljauw	COD	DCOD
Wijting	WHG	DWHG
Schol	PLE	DPLE
Schar	DAB	DDAB
Zwemkrab	CRS	DCRS
Strandkrab	CRA	DCRA
Noordzeekrab	CRE	DCRE
Bruinvis	PHO	PHO

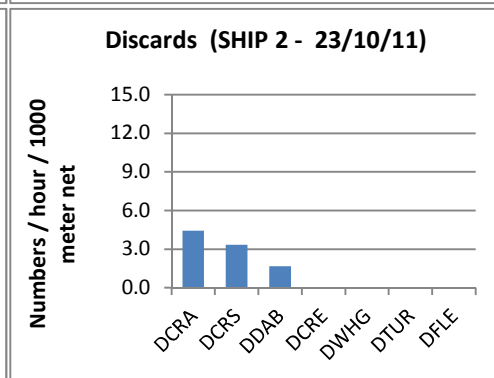
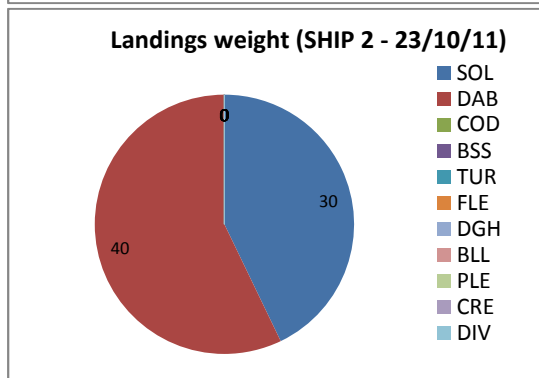
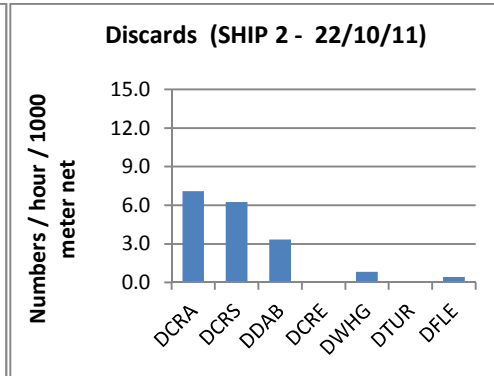
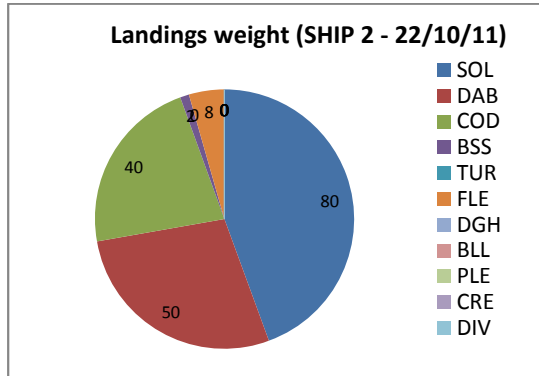


Annex 2. Self-sampling data by trip

Landings and discards data from three Gillnet fishing trips in September. The upper panels show registered landings (in kg) and their composition (SOL=sole, TUR=turbot, BSS=sea bass, COD=cod, DAB=dab, PLE=plaice, CRE=edible crab, BLL=brill, DGH=dogfish). The lower panels show the estimated number of discards by species (DTUR=turbot, DDAB=dab, DCRE=edible crab, DCRA=green shore crab, DCRS=flying crab).



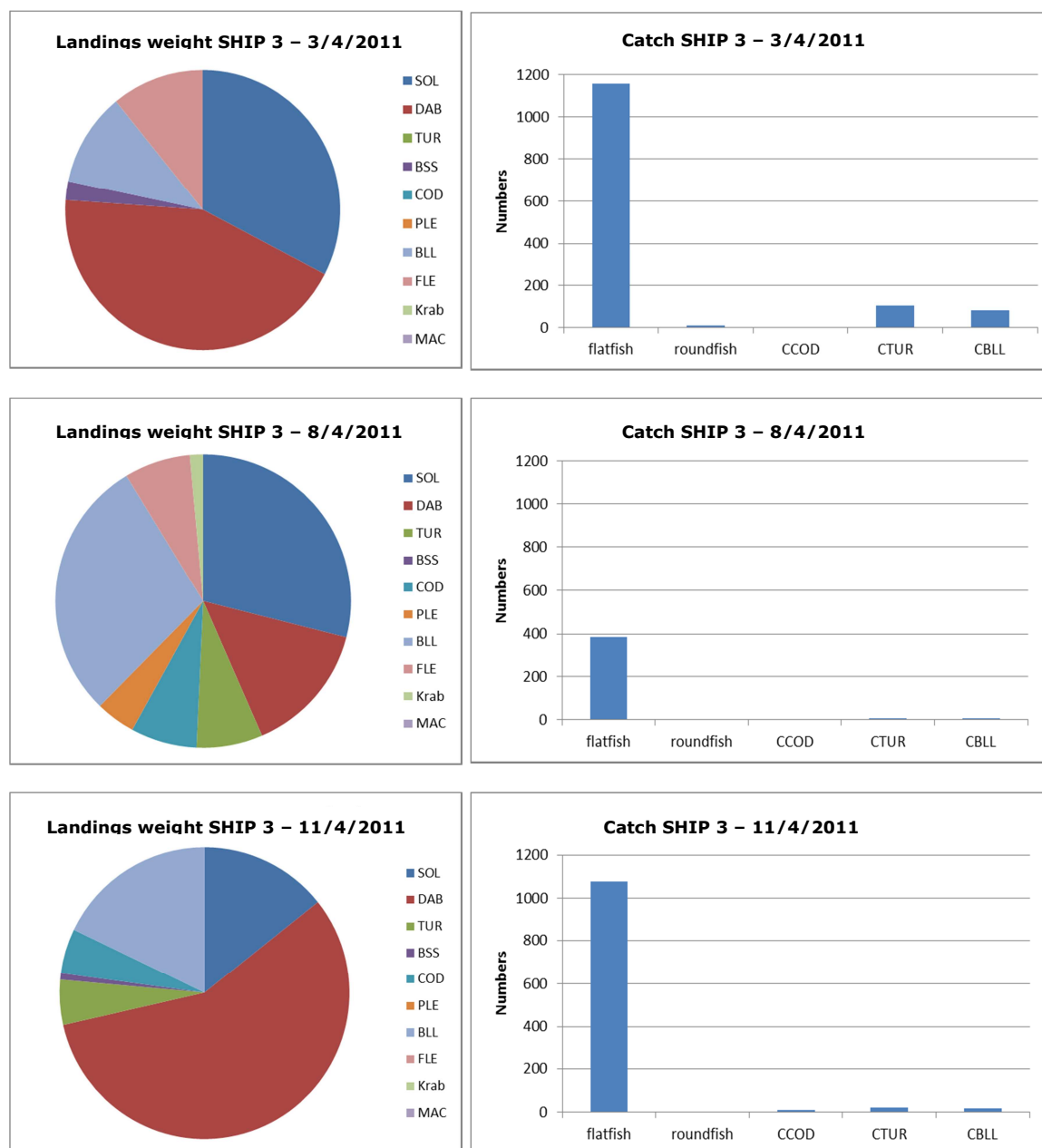






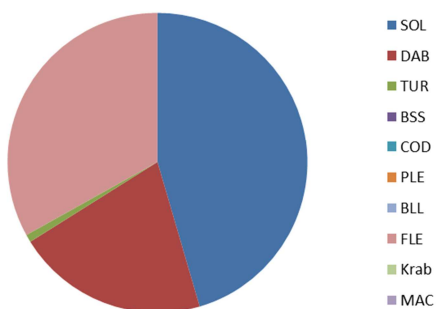
Annex 3. EM data by trip

Landings and discards data from six Gillnet fishing trips in April, July and August. The left panels show registered landings (in kg) and their composition (SOL=sole, DAB=dab, TUR=turbot, BSS=sea bass, COD=cod, PLE=plaice, BLL=brill, FLE=flounder, Krab= edible crab, MAC=mackerel). Source: EU logbooks. The right panels show the estimated number of total catch by species by trip (CCOD=total catch of COD, CTUR=total catch of Turbot, CBLL=total catch of brill, CSOL=total catch of sole). During trip 03/04/11, 08/04/11 and 11/04/11 sole was grouped with the other flatfish. The flatfish group may contain Turbot, Brill or Sole because the fish could not always be identified as such.

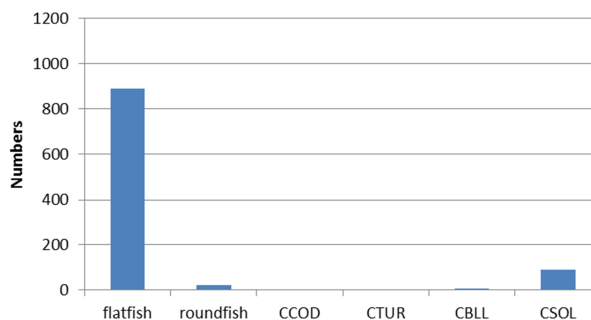




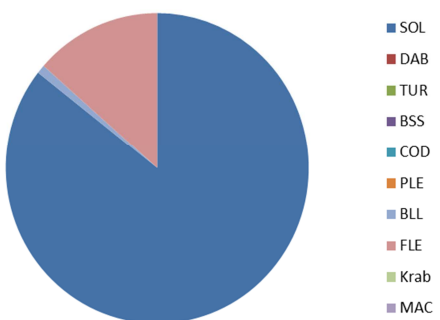
Landings weight SHIP 3 – 27/7/2011



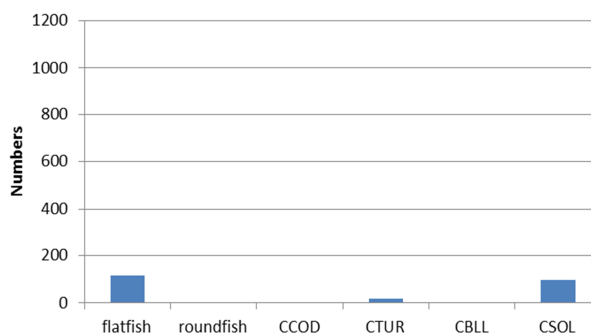
Catch SHIP 3 – 27/7/2011



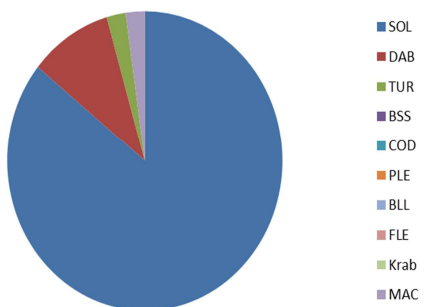
Landings weight SHIP 3 – 18/8/2011



Catch SHIP 3 – 18/8/2011



Landings weight SHIP 3 – 25/8/2011



Catch SHIP 3 – 25/8/2011

