June and October 2014 ICES advice – Commentary on discards (taken verbatim from ICES text)

Covers: North Sea, Celtic Sea and West of Scotland, Baltic Sea

REGION	ICES COMMENT
	COD
ECOREGION: North Sea **STOCK: Cod in Subarea IV (North Sea), Division VIId (Eastern Channel), and IIIa West (Skagerrak)**	**Figures** Cod discards relative to total catch - declined from record high in 2007 to just above historical average in 2010-2013 (from 49% to 21-28% weight of cod discarded from the total cod catch). **Considerations** In February 2008 Scotland implemented a national scheme known as the 'Conservation Credits Scheme'. The principle of this two-part scheme involves additional time at sea in return for the adoption of measures which aim at reducing mortality on cod and leading to a reduction in discard numbers. One measure was real-time closures. In 2010 there were165 closures, and from July 2010 the area of each closure increased (from 50 square nautical miles to 225 square nautical miles). During 2011 there were 185 of these larger closures, while there were 173 in 2012. ICES notes that from the initial year of operation (2008) cod discarding rates in Scotland have decreased from 62% in 2008 to 24% (by weight) in 2011 and 2012, but have increased again to 31% in 2013. International discard rates in the period where unallocated catch is estimated (1993 –2005) are considered not comparable to the later period because of the potential for fish to become undeclared landings instead of discards. There is clear indication, however, that the discard rate for age 2 fish has been increasing since the early 1980s.
ECOREGION: Celtic Sea and West of Scotland **STOCK: Cod in Division VIIa (Irish Sea)**	**Figures** Discard estimates are available from 2007 for most of the main fleets. The observed discard rates are highly variable between trips and gears, leading to concerns about the accuracy of the total raised estimates. Consequently, the raised discard estimates are highly variable between years. Total catches in 2013 were 324 t. Landings are estimated at 206 t (48% Nephrops trawls, 34% other trawls, 11% beam trawls, and 7% other gears).
ECOREGION: Celtic Sea and West of Scotland **STOCK: Cod in Divisions VIIe-k (Celtic Sea Cod)**	**Figures** Discards in 2013 are known to take place but cannotbe fully quantified (in the order of 9%).
ECOREGION: Celtic Sea and West of Scotland **STOCK: Cod in Division VIa (West**	**Figures** Discards reported to ICES (all fleets combined) are roughly four times greater than landings. Total catch in 2013 was 1501 t, where 20% are reported landings adjusted for misreporting and 80% are discards. Landings were 299 t (TR1 88%; TR2 4%; others 8%). Discards were 1202 t (TR1 72% and TR2 28%). Discard estimates are based primarily on sampling by Marine Scotland Science

of Scotland)	(MSS; covering around 16 trips). A parallel sampling programme organized by the Scottish Fishermen's Federation (SFF; covering around 34 trips). indicates lower discard rates (although not yet raised to fleet level), which may indicate more selective fishing practices. The inclusion of the SFF data may improve the accuracy and precision of discard estimates used in the assessment although this process is currently hindered by methodological issues.
ECOREGION: Baltic Sea **STOCK: Cod in Subdivisions 25-32 and 22-24**	**Considerations** To decrease discards, a "Bacoma" codend with a 120 mm mesh was introduced by the International Baltic Sea Fisheries Commission (IBSFC) in 2001 in parallel to an increase in diamond mesh size to 130 mm in traditional codends. The expected effect of introducing the "Bacoma" 120 mm exit window was nullified by compensatory measures in the industry. This was to some extent explained by the mismatch between the selectivity of the 120 mm "Bacoma" trawl and the minimum landing size. In October 2003, the regulation was changed to a 110 mm "Bacoma" window. This was expected to enhance compliance and to be in better accordance with the minimum landing size, which was changed from 35 to 38 cm in the same year. As of 1 January 2010 the "Bacoma" 120 mm was reintroduced along with an extended "Bacoma" window (5.5 m) to further decrease discarding, and the minimum landing size was kept at 38 cm. The increase in minimum landing size from 35 to 38 cm has increased discard rates. The recent increase in flatfish abundance interferes with the selectivity of the "Bacoma" codend, and discarding of unwanted flatfishes and undersized cod (due to clogging of the net by flatfishes) may have increased in 2011 and 2012 (cases reported for Sweden and Germany). The discards by trawlers increased in 2013 in Subdivision 24, consistently observed in sampling programmes of all countries involved. The fact that only 65% of the 2013 TAC was taken was due to reduced catches of cod for trawlers from the summer months onwards. **25-32:** There are indications that discards in general have increased recently, particularly of older age groups, which is probably due to cod being in a more poor condition and having slower growth. The amount of fish above the minimum landing size (38 cm) has recently diminished and the amount of fish below the minimum landing size has increased in the population (Figure 8.3.3.2). This has likely been a consequence of decreased growth. Age groups that were previously above the minimum landing size are now below it. This can partially explain the fact that the quotas are not filled and may also contribute to the increased discarding.
HADDOCK	
ECOREGION: North Sea **STOCK: Haddock in Subarea IV (North Sea) and Division IIIa West (Skagerrak)** **Now also includes Haddock in Division VIa (West of Scotland)**	**Figures** Discards are highly variable without obvious long-term trend but appear to have been declining in recent years. Discard rates in 2012 and 2013 are the lowest observed in the time-series and appear to be linked to low recruitment. The estimates of discards in the West of Scotland for 2013 are based primarily on sampling by Marine Scotland Science (MSS; covering round 16 trips), which indicates high discarding in the Scottish TR2 Nephrops fleet (both as a percentage of TR2 catches and as a percentage of total discards). A parallel sampling programme organized by the Scottish Fishermen's Federation (SFF; covering around 34 trips) indicates much lower discard rates, which may indicate more selective fishing practices. SFF sampling covers more vessels, but attempts to include the SFF estimates in the data used for ICES assessments are currently hindered by methodological issues. It was also noted that the SFF discard rates mentioned above had not been raised to the fleet level. These issues are to be addressed in time for next year's assessments.

New advice in Nov 2014	**Considerations** Any measure to reduce discarding and to improve the fishing pattern should be actively encouraged. In February 2008 Scotland implemented a national scheme known as the "Conservation Credits Scheme". The principle of this two-part scheme involves additional time at sea in return for the adoption of measures which aim to reduce mortality on cod and lead to a reduction in discard numbers (real-time closures and technical measures). In 2010 there were 165 closures, and from July 2010 the area of each closure increased (from 50 square nautical miles to 225 square nautical miles). During 2011 there were 185 of these larger closures, while there were 173 in 2012 and 166 in 2013. The effects of this regulation on the behaviour of the fleet and on the haddock stock have been investigated, but do not show a consistent pattern. **In VI** The introduction of closed-circuit TV (CCTV, 20% of landings in 2013) and fully documented fisheries (FDF) programmes starting in 2010 in Scotland, Denmark, Germany, the Netherlands, and England is expected to have contributed to the reduction of cod mortality. Under this scheme, UK vessels are not permitted to discard any cod, while Danish and German vessels are still permitted to discard undersized cod. For all vessels taking part, all cod caught are counted against the quota. Vessels carrying CCTV systems may preferentially target haddock to prevent exhausting the cod quota and having to tie up. The uptake of the Scottish haddock quota in 2012 and 2013 was very close to 100%, which contrasts with historical underutilization of the quota and supports the hypothesis of increased targeting combined with a quota that was predicted to be restrictive. **New advice in Nov 2014** Discards are highly variable without obvious long-term trend but appear to have been declining in recent years. Discard rates in 2012 and 2013 are the lowest observed in the time-series and appear to be linked to low recruitment. The estimates of discards in the West of Scotland for 2013 are based primarily on sampling by Marine Scotland Science which indicates high discarding in the Scottish TR2 Nephrops fleet (both as a percentage of TR2 catches and as a percentage of total discards). A parallel sampling programme organized by the Scottish Fishermen's Federation (SFF; covering around 34 trips) indicates much lower discard rates, which may indicate more selective fishing practices. SFF sampling covers more vessels, but attempts to include the SFF estimates in the data used for ICES assessments are currently hindered by methodological issues. It was also noted that the SFFdiscard rates mentioned above had not been raised to the fleet level. These issues are to be addressed in time for next year's assessments.
ECOREGION: Celtic Sea and West of Scotland **STOCK: Haddock in Division VIb (Rockall)**	**Figures** Total catches (2013) = 1967 t, of which 826 t were landings (85% trawl and 15% longline) and 1143 t discards (58% by weight and 87% by numbers). **Considerations** Haddock in Division VIb are caught in a directed fishery and as a bycatch in demersal trawl and longline fisheries. Haddock are mostly taken in fisheries deploying otter trawls, but also by pair trawlers and longliners. In recent years, discards have been significantly reduced prior to 2013 as a result of the small number of young haddock in the population. Discards significantly increased in 2013 and are expected to remain high in 2014 as a consequence of the strong 2012 year class. Further technical measures to reduce bycatch discarding of the recruiting year classes should be considered. These might include increasing the mesh size in the square mesh panels and/or increasing the mesh size in gadoid fisheries catching haddock, as well as considerations on minimum landing size.

ECOREGION: Celtic Sea and West of Scotland **STOCK: Haddock in Division VIIa (Irish Sea)**	**Figures** Total catch (2013) = 537 t, where 254 t were estimated landings (75% otter trawls, 14% Scottish seines, 8% mid-water trawl, and 3% other gear-types) and 283 t discards. The discard rates for Nephrops fleets (TR2 70–99 mm mesh size) in 2011 were 99–100% for one-year-olds, 63–94% for two-year-olds, and 3–21% for three-year-olds by number. **Considerations** Further technical measures should be introduced to reduce discards. An increase in mesh size to reduce discarding will be beneficial to this stock and could increase future yield. Reduced selectivity on younger ages would reduce discarding and promote stock increase when strong year classes occur. Some fleets are using 70–99 mm mesh to target Nephrops, 90 mm mesh in mixed fisheries, and 100+ mm to target gadoids and other species. Recent gear trials have shown that square mesh panels can significantly reduce discards of undersized haddock (BIM, 2009). Discarding at younger ages is a serious problem for this stock. **Management considerations** The relative recruitment estimate for age 1, in 2014, is the highest in the series. In recent years there has been a decline in the estimated catches because of a restrictive TAC for cod in Division VIIa and a reduction in discards as a result of both the mandatory use of highly selective gears in the UK and Irish fleet and low levels of recruitment. Current TAC management measures are not considered responsive enough to the dynamic nature of changes in stock abundance. The observed high recruitment in 2014 suggests that there will be an increase in stock abundance in the coming years; basing catch advice on recent catches will restrict fishing opportunities. Technical measures including, grids, separator trawls, quad rigs, and eliminator trawls have been introduced by the TR2 fleets in recent years. All of these devices have been shown to significantly reduce haddock catch rates and subsequent discards.
ECOREGION: Celtic Sea and West of Scotland **STOCK: Haddock in Divisions VIIb-k**	**Figures** Total catch (2013) = 15.3 kt, of which 88% were estimated landings (73% otter trawls; 10% seines; 4% beam trawls, and 13% others) and 12% discards. **Considerations** Further technical measures to reduce bycatch discarding of the 2013 year class should be considered. These might include increasing the mesh size in the square mesh panels and/or increasing the mesh size in gadoid fisheries catching haddock. The stock size and catches have fluctuated strongly with an increasing trend over time despite fishing mortalities well above the FMSY. The size of the stock is determined to a large extent by recruitment, which is erratic. The strong 2013 cohort will be around the MLS of 30 cm in 2015. Restrictive quotas in recent years have led to increased high grading of marketable fish. Management should focus on improving the selection of haddock in the mixed fishery and deterring high grading due to restrictive quotas. UK industry reported that in the first half of 2014, high catch rates of haddock were becoming a problem in most fisheries (trawl, beam trawl, and gillnets) due to the restricted TAC not covering bycatch for many vessels. This is supported by records from UK observers who have commented on high catch rates of small haddock in Divisions VIIe, VIIf, and VIIh in the first half of 2014. Uncertainties in the assessment and forecast. Highgrading was higher in the last three years because of restrictive quota. This is not expected to persist because of the strong decline in the stock (the 2014 TAC is unlikely to be restrictive). This was addressed in the catch options for 2015; it was considered more appropriate to use the average of the discard pattern of the whole time-series, rather than the average of the last three years, as done previously.

HAKE	
ECOREGION: **Highly migratory** **STOCK:** **Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa,b,d (Northern stock)**	**Figures** Total catch in 2013 is unknown. ICES estimates of landings = 76.7 kt (19% trawl, 23% gillnet, 26% longline, and 32% unspecified gears). Discards (2013) were 15.8 kt; 75% of the known discards are included in the assessment. Additional discards are known to occur in other fleets but the data are not available. **Considerations** Hake is caught in mixed fisheries together with megrim, anglerfish, and Nephrops; the composition of species in the fishery is dependent on the area fished and the gear used. Discards of juvenile hake can be substantial in some areas and fleets. Overall, stock discards have increased substantially in the last five years and the increase is general for all fleets. An important increase in catches has occurred in the northern part of the distribution area (Division IIIa, and Subareas IV and VI) in recent years. Several changes in fishing technology have taken place in the fishery in recent years, including increased mesh sizes in several gears, introduction of the high vertical opening trawls in the mid-1990s, and introduction of selective gears in the Nephrops trawl fishery of the Bay of Biscay (square mesh panel). Discards of juvenile hake can be substantial in some areas and fleets. The spawning-stock biomass and the long-term yield can be substantially improved by reducing mortality of small fish. This could be achieved by measures that reduce unwanted bycatch through shifting the selection pattern towards larger fish. TACs have been ineffective in regulating the fishery in recent years as landings greatly exceeded the TACs. Discards of large individuals have increased in recent years because of quota restrictions in certain fleets.
ECOREGION: **Highly migratory** **STOCK:** **European hake in Atlantic Iberian waters** **ICES divisions VIIIc, IX and X (Southern stock)**	**Figures** Total catch (2013) as estimated by ICES = 16.4 kt, where 13.54 kt were landings (4.46 kt trawlers, 5.74 kt other fleets, and 3.33 kt unallocated) and 2.87 kt discards (17% of the total catch). **Considerations** The minimum landing size for southern hake is 27 cm. There is no match between minimum landing size and the trawl mesh size currently enforced. This results in high discard rates.
MEGRIM	
CelticSea and West of Scotland **STOCK Megrim (Lepidorhombus whiffiagonis) in Divisions VIIb–k and VIIIa,b,d**	**Figures** Total catch (2013): 19.95 kt where 79% estimated landings (70% trawl approximately 30% not provided), partial 21% discards by weight. Discarding of smaller megrim even above the minimum landing size (MLS) of 20 cm is substantial. Improving the selection pattern should benefit the stock and result in a higher long-term yield
ECOREGION Bay of Biscay and Atlantic Iberian waters **STOCK Megrim (Lepidorhombus whiffiagonis) in Divisions VIIIc and IXa**	**Figures** For the main fleet, discard levels are estimated to be in the range of 10–45% (in numbers). Discards are included in the assessment since the benchmark conducted in 2014. The inclusion of discards has led to only a slight upwards revision of the recruitment estimates, not altering the overall perception of stock trends

ECOREGION Bay of Biscay and Atlantic Iberian waters STOCK Four-spot megrim (Lepidorhombus boscii) in Divisions VIIIc and IXa	**Figures** For the main fleet, discards are in the range of 39–63% (in numbers), and the majority of these are age 1–3. Discards are included in the assessment since the benchmark conducted in 2014. The inclusion of discards has led to an upwards revision of the recruitment and fishing mortality estimates, but has not altered the overall perception of stock trends.
NEPHROPS - ECOREGION: North Sea STOCK: Nephrops in Division IV North Sea	
FU 6 Farn Deeps	Total dead removals (2013) = 3431 t, of which 87% were landings (almost entirely taken in demersal trawl fisheries, either a directed Nephrops or a mixed Nephrops/demersal fishery) and 13% dead discards in weight. 26.1% by number. The total discard rate is assumed to be 26.61% of the catches (in number, average of the last three years (2011–2013)); discard survival is assumed to be 15% (ICES, 2013).
FU 7 Fladen Ground	Total catch (2013) = 2959 t, where 2959 t were ICES landings taken in demersal trawl fisheries, either in a directed Nephrops or a mixed Nephrops/demersal fishery (93% TR2, 7% TR1 gears). Observer trips recorded no Nephrops discards in 2013.
FU 8 Firth of Forth	The Nephrops fishery in the Firth of Forth is dominated by UK (Scotland) vessels, with low landings reported by other UK nations. Nephrops discard rates are higher than in a number of other areas but the rates have declined to 25% by number and 14% by weight (average 2011–2013). Total catch (2013) = 1802 t, where 1501 t were ICES landings almost entirely taken in demersal trawl fisheries, either a directed Nephrops or a mixed Nephrops/demersal fishery (96% TR2, 4% creel gears), and 301 t are discards in weight.
FU 9 Moray Firth	Total catch (2013) = 665 t, where 655 t were ICES landings almost entirely taken in demersal trawl fisheries, either in a directed Nephrops or a mixed Nephrops/demersal fishery (94% TR2, 5% TR1, 1% creel gears), and 10 t are discards in weight
NEPHROPS – ECOREGION North Sea STOCK: Nephrops in Division IIIa	
FU 3 & 4 Skagerrak–Kattegat	Total discard ratio is assumed to be 67.2% of the catches (by number, average of last three years, 2011–2013), discard survival is assumed to be 25%.
NEPHROPS - ECOREGION Celtic Sea and West of Scotland STOCK Nephrops in Division VIa	
FU 11 North Minch	**Figures** The total discard rate is assumed to be 14.2% of the catches (in number, average of the last three years, 2011–2013); discard survival is assumed to be 25%. The minimum landing size for Nephrops in Division VIa is 20 mm carapace length. Discarding of both undersize and poor quality Nephrops sometimes takes place in this FU. Discard rates have been variable but generally lower than 20%. The mean sizes in the length compositions of larger individuals (>35 mm CL) are relatively stable but the mean weight in landings has fluctuated markedly over the last five years, although 2013 is a particularly high year. To dampen this variability, the time-series average (1999–2013) was used as input for the mean weight in landings for the catch forecasts.
FU12 South Minch	**Figures** Total discard rate is assumed to be 7.4% of the catches (in number, average of the last three years, 2011–2013). Discard survival is assumed to be 25%. The minimum landing size for Nephrops in Division VIa is 20 mm carapace length.

	Discarding of both undersize and poor quality Nephrops sometimes takes place in this FU. Discard rates have been variable but generally lower than 20%. The mean sizes in the length compositions of smaller individuals (< 35 mm CL) has increased consistently suggesting low recruitment in recent years. The mean weight in landings increased markedly in 2011, with some decrease over the last two years. The time-series average (1999–2013) was used as input for the mean weight in landings for the catch forecasts.
FU 13 **Firth of Clyde and Sound of Jura**	**Figures** Total discard rate is assumed to be 20.2% of the catches (in number, average of the last three years, 2011–2013); discard survival is assumed to be 25%. The minimum landing size for Nephrops in Division VIa is 20 mm carapace length. Discarding of both undersized and poor quality individuals takes place in Clyde
NEPHROPS – ECOREGION IRISH SEA & CELTIC SEA Nephrops in area VII	
FU 15 **Irish Sea West**	**Figures** The proportion of discarded Nephrops is substantial. On average over the last three years, around 28% in numbers (or 17% in weight) of the Nephrops caught are estimated to have been discarded. **Considerations** The Nephrops trawl fishery takes bycatches of other species, especially plaice, but also whiting and cod. In response to the long-term management plan for cod (EC 1342/2008), Northern Ireland and Ireland have introduced more species selective gears primarily to reduce bycatch of cod, but the devices thus far introduced are also known to reduce discards of other species. Despite this, selectivity of this fishery needs to be further improved to reduce bycatches of juvenile whiting in particular.
FU 17 **Arran Grounds**	**Figures** Total discards of Nephrops and other organisms by the Nephrops trawl fleet is around 47% of the total catch by weight. The main discards are small Nephrops. The main fish species discarded are dogfish, haddock, whiting, and megrim. The proportion of discarded Nephrops is substantial. On average over the last three years, around 17% (in numbers) or 10% (in weight) of the Nephrops caught are estimated to have been discarded.
Ireland **South West** **FU 19**	**Figures** Nephrops fisheries in this area are fairly mixed, landing also megrim, anglerfish, haddock, and other demersal species. Around 44% of the total catch by weight is discarded. The main discarded fish species are haddock and boarfish. The proportion of discarded Nephrops in this FU is high relative to other areas. This is because the vessels tend to be small with limited space and crew so the on-board tailing of the catch is not as prevalent as in other FUs around Ireland.
ECOREGION: Bay of Biscay and Atlantic Iberian waters **STOCK Nephrops in Divisions VIIIa,b (Bay of Biscay, FUs 23–24)**	**Figures** Small-sized Nephrops are subject to high fishing mortality and discards of Nephrops are substantial in this fishery (50–65%). In 2006, the minimum landing size (MLS) was increased. Because this was not followed by an improvement of the selection pattern, this has led to a record-high discard rate. The spawning biomass and the long-term yield can be substantially improved. This can be achieved by improving the selection pattern.
PLAICE	
ECOREGION: North Sea **STOCK: Plaice in Division IV (North Sea)**	**Figures** Plaice is predominantly targeted by beam trawlers in the central part of the North Sea with a minimum mesh size of 100–120 mm, depending on the area. In addition, plaice is caught in a mixed fishery which targets sole in the southern North Sea with a minimum mesh size of 80 mm. The catches of this latter fishery include plaice under the minimum landing size of 27 cm, which results in high

	discard rates. The total fleet discard ratio has gradually decreased since 2000. Total catch in 2013 was 118,135 t, where 78,905 t were estimated landings (58% beam trawl, 26% otter trawl, and 16% other gears) and 38 700 t were discards. Although discards form a substantial part of total plaice catches, for which estimates are less certain than for landings, the assessment at present includes 13 years of discard data obtained from sampling programmes in several countries (covering 68% of the landings in 2013) and is considered to be robust and consistent between years. **Considerations** Discard data are now available from Denmark (beam trawls, otter trawls, Scottish and Danish seines, gillnets, and longliners); the United Kingdom (for beam trawls up to 2007); Germany (beam trawls, otter trawls, and gillnets); Belgium (beam trawls); and the Netherlands (beam trawls, otter trawls, and seines). Since 2009, estimates of discards by the Netherlands are derived from a self-sampling programme by the industry, coordinated by fishery scientists. Mid-2011 the programme was redesigned, to allow for better comparison between self-sampling and observer estimates through paired measurements. From 2011 onwards, Dutch discard estimates are derived exclusively from the self-sampling programme, while observer estimates are used for validation of the self-sampling data. Preliminary analyses suggest that the self-sampling estimates are as reliable as those from the observer programme. Data from "matched trips" (self-sampling and observer estimates from the same vessel trip) are routinely analysed for comparison.
ECOREGION: Celtic Seas and West of Scotland **STOCK: Plaice in Division VIIa (Irish Sea)**	**Figures** Catch (2013) = 1049 t (32% landings, 68% discards). ICES estimates of landings = 309 t (52% beam trawl, 46% otter trawl, and 2% other gear types). ICES estimates of discards = 740 t (46% beam trawl, 52% otter trawl, and 1% other gear types). **Considerations** The high level of discarding in this fishery is a consequence of the mesh sizes used in the Nephrops trawl TR2 (70–99 mm) and beam trawl BT2 (80–99 mm) fleets. These gears catch large numbers of fish below the MLS of 27 cm. The options for technical measures to reduce small plaice catches while retaining the main target species, Nephrops and sole, are limited. Spatiotemporal changes in the fishery may help avoid areas or periods with high small plaice bycatch. Technical measures in force are minimum mesh sizes and minimum landing size (27 cm). The TAC is not a constraint; from 1998 onwards landings have been consistently below the TAC. Considering the high level of discarding observed in this stock, gear selectivity regulations have had little effect. The closures of cod spawning grounds that have been in force since 2000 are unlikely to have had a significant impact on catches by the plaice fishery. In 2000, the closure covered the western and eastern Irish Sea. Since then, the closure has been mainly in the western part, whereas the majority of the plaice fishery has taken place in the eastern part of the Irish Sea.
ECOREGION: North Sea **STOCK: Plaice in Division VIId (English Channel)**	**Figures** Plaice is mainly caught in 80 mm beam-trawl (Belgian and English) fisheries for sole or in mixed demersal fisheries using otter trawls (mainly French). There is also a directed fishery during parts of the year by inshore trawlers and netters. Fisheries operating on the spawning aggregation in the beginning of the year catch plaice that originate from the North Sea, Divisions VIId and VIIe components. Since the 80 mm mesh size does not match the minimum landing size for plaice (27 cm), a large number of undersized plaice are discarded. Total catch unknown, official landings of plaice in Division VIId (2013) = 4161 t,

	including plaice from IV and VIIe in the beginning of the year (39% beam trawl, 30% otter trawl, 16% trammel nets, and 15% other gears). Discards are known to take place but are not fully quantified. (In the last 3 years discards were in the order of 30-40%).
ECOREGION: North Sea **STOCK: Plaice in Division VIIe (Western Channel)**	**Figures** Total catch (2013) = 580 t, where 1350 t were estimated landings (55% beam trawl, 37% otter trawl, 5% fixed nets, and 2% other gear). In addition, 176 t landed from Division VIId are included in the assessment, reflecting the 15% 1st quarter migration correction (all Division VIId gears). Discards (2013) 17% by weight. Plaice are taken as a bycatch in the beam trawl fishery that mainly targets sole and anglerfish, and as part of a mixed demersal fishery by otter trawlers. The main fishery is south and west of Start Point. Although plaice are taken throughout the year, the larger landings in the most recent years have been between May and November. Discarding appears to be generally higher in quarters 1 and 2, but is low compared to other plaice stocks (about 20%).
ECOREGION: Celtic Sea/West of Scotland STOCK Plaice in Divisions VIIh–k (Southwest of Ireland)	**Figures** Discard rates are high; in 2013 55% of the plaice (by number) caught in Divisions VIIjk were discarded (39% byweight). Total catch (2013) is unknown, landings estimates (Divisions VIIh–k, 2013) = 182 t (70% otter trawl, 21% beam trawl, 9% other/unknown gear types). Discards in Division VIIh are unknown. Discards in Divisions VIIjk are in the order of 30% of the catch (average 2007–2013).
ECOREGION: Celtic Sea and west of Scotland **STOCK: Plaice in Division VIIf and g (Celtic Sea)**	**Figures** The mixed plaice and sole fishery is dominated by beam trawls and otter trawls, with bycatch of both commercial and non-commercial species. The main fishery occurs in the spawning area off the north Cornish coast, at depths greater than 40 m, approximately 20 to 25 miles offshore. Although plaice are taken throughout the year, the bulk of landings occur during February–March following the peak of spawning, and again in September. There is a high rate of discarding in both beam and otter trawl fisheries. Recent discard rates are very high, more than double the landings in 2011–2013. **Considerations** The high level of discarding indicated in this mixed fishery would suggest a mismatch between the mesh size employed and the size of the fish landed. Increases in the mesh size of the gear will result in fewer discards and increased yield from the fishery. The use of larger-mesh gear and spatial temporal measures to avoid small plaice should be encouraged in this fishery in instances where mixed -fishery issues allow for it.
SOLE	
ECOREGION: North Sea **STOCK: Sole in Division VIId (Eastern Channel)**	Discards were assumed to be negligible prior to this assessment, but preliminary information indicates discards in the region of 10% (2011-2013).
ECOREGION: North Sea **STOCK: Sole in IV (North Sea)**	Discards (in the order of 20%) are known to take place but cannot be fully quantified.
ECOREGION: North Sea **STOCK: Sole in VII f, g (Celtic Sea)**	Although discard rates of sole are low in beam trawl fisheries (about 2–5% in weight), discard rates of other (commercial and non-commercial) species can be considerable. Beam trawling, especially when using chain-mat gear, is known to have a significant impact on the benthic communities, although less so on soft substrates and in areas which have been historically exploited by this fishing method. Benthic drop-out panels have been shown to release around 75% of benthic invertebrates from the catches.

ECOREGION: North Sea **STOCK: Sole in VIIa (Irish Sea)**	Discards = 9 t (6% by weight). Although discard rates of sole are low in these fisheries, discard rates of other (commercial and non-commercial) species can be considerable. Beam trawling, especially when using chain-mat gear, is known to have a significant impact on the benthic communities, although less so on soft substrates.
ECOREGION: North Sea **STOCK: Sole in Division VIIe**	Discards are considered negligible. Discard rates of non-commercial species and commercial species of unmarketable size are substantial. Some beam trawlers are experimenting with benthic drop-out panels that release about 75% of benthic invertebrates from the catches. Full square mesh codends are being tested in order to reduce the capture of benthos further and improve the selection profile of gadoids.
WHITING	
ECOREGION: Celtic Sea and West of Scotland **STOCK: Whiting in Divisions VIIb-k**	Discard rates are very high (mainly ages 1 and 2) due to the low market value of this species. Square mesh panels were introduced in 2012 in the Celtic Sea, aimed particularly at reducing bycatches and discards of whiting and haddock. These measures are expected to have reduced whiting discards but were not accompanied by specific monitoring programmes. Further technical measures are under consideration in 2014.
ECOREGION: Celtic Sea and West of Scotland **STOCK: Whiting in Division VIa (West of Scotland)**	An analytic TSA assessment indicates an increasing mismatch between the survey catchability and the fishery. This may lead to unknown underestimation of stock size. The majority of catches have been discarded in recent years. Discard information is imprecise compared to landings data due to lower sampling levels. The mean weights-at-age in the catch have also been quite variable in recent years because of low and patchy sampling levels.
ECOREGION: Celtic Sea and West of Scotland **STOCK: Whiting in Division VIIa (Irish Sea)**	**Figures** After a period of incomplete discard information between 2003 and 2006 discard estimates are available for the main fleets and sampling coverage has improved. Discards in recent years have been high and variable relative to landings; mainly between 1000-2000t with landings generally less than 100 t. Survey and catch data are consistent with a high total mortality and low stock size since the early 2000s.Total catch in 2013 was 1.0kt, where 0.03kt were estimated as landings, 0.96kt discards (94% Nephrops trawls, 2% finfish trawls, 2% beam trawls and 2% other gears). **Considerations** The majority of the catch was below minimum landing size of 27 cm. High rates of discarding of juvenile whiting in the Irish Sea led to the mandatory use of 80mm square mesh panels in Nephrops trawl fleets (TR2) in the early 1990s. Further technical measures including, grids, separator trawls, quad rigs and eliminator trawls have been introduced by the TR2 fleets in recent years. All of these devices have been shown to significantly reduce whiting catch rates and subsequent discards. Given the continued high discards and low TAC this stock could become a major 'choke species' for the VIIa Nephrops fishery in the context of the landing obligation.
ECOREGION: North Sea **STOCK: Whiting in Subarea IIIa (Skagerrak – Kattegat)**	Discard information available since 2003, average discard proportion 2011-2013 from the majority of the main fleets 85 % (covering 68% in 2012 and 81% in 2013 of the landings).

ECOREGION: North Sea **STOCK: Whiting in Subarea IV (North Sea) and Division VIId (Eastern Channel)**	The minimum mesh size was increased for demersal whitefish vessels to 120 mm in the northern North Sea in 2002 and this may have contributed to the substantial decrease in catches. Landing compositions from this area, in 2006 to 2009, indicate improved survival of older ages. In addition, the total number of discarded fish appears to have been reduced since 2003, from around 60% in 2003 to around 33% in 2012 and 22% in 2013. Because of the restrictive TACs, discard rates increased in 2010 and 2011, although they are estimated to have decreased again in 2012 and 2013. More selective gears were introduced in the Nephrops (TR2) fleet in 2012 which may also have contributed to a decline in discard rates.

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