Manual for harbour sampling of fish for human consumption conducted by DTU Aqua

Revised 10/06 - 2020

Background

In 2015 a new random selection system was introduced in the harbour sampling program in Denmark. Before 2015 the harbour sampling was conducted as quota sampling where a known harbour was called beforehand and the relevant species was sampled until the wanted numbers of boxes/fish per sorting size was obtained per quarter. This system could have the disadvantage that a large amount of fish was measured on the same day / from same vessel as the effort was the numbers of boxses and not the numbers of harbour visits. The system is based on the outcome from ICES working group WKPICS2.

Sampling design

The new system is trying to obtain a minimum of 80% of all landings by weight, values and trips of the relevant stocks (area X species) are covered in the sampling program. All stocks Denmark is obliged to sample according to the EU commission implementing decision (2016/1701) of 19 August 2016, from human consumption landings, have been listed by area (table 1).

Table 1. Species list Denmark are obliged to sample by area.

Stock	Speices (Danish name)	Sample area
Cod 2224	TOR	22-24
Cod 2532	TOR	25-32
Cod 21	TOR	21
Cod IV + IIIAN	TOR	IV+IIIA
Ple 2123	RSP	21-23
Ple 2432	RSP	24-32
Ple IV+ 3AN	RSP	IV+IIIA
Dab 2232	ISG	22-32
Dab IV + IIIA	ISG	IV+IIIA
Tur IV	PGH	**only** IV
Sai IV +IIIA	MSJ	IV+IIIA
Lin IV + IIIA	LNG	IV+IIIA
Hke IV+IIIA	KLM	IV+IIIA
Had IV+ IIIA	KUL	IV+ IIIA
Wit IV+ IIIA	SKI	IV+ IIIA
Ang IV	HAT	**only** IV
Lem IV + IIIA	RTG	IV + IIIA
Sol IV	TNG	**IS NOT SAMPLED ANYMORE**
Hav IV	Havkat	**IV**
Ell Baltic	ELL	**22-32**

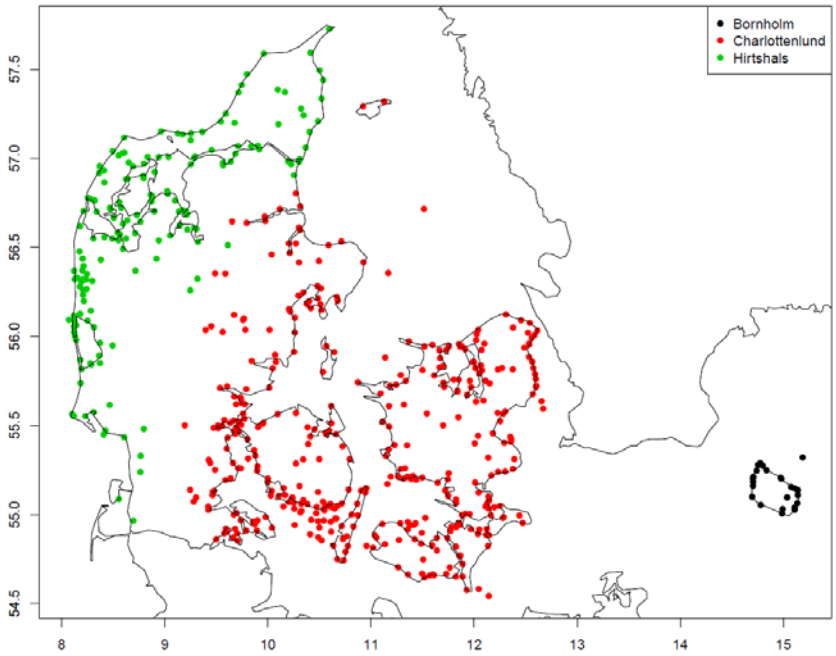
Flounders in 22-32 and sole in IIIa and 22 are also selected for sampling. However, duo to the relatively low landing levels a separate sampling program has been introduced for these stocks were the landing fraction is sampled in the observer program.

All harbours have been listed and the harbours were 80% of the landings in weight, value and trips by stock were selected for sampling. A forth parameter was included before the harbours

were ranked, the cost of sampling in the selected harbour. Then the harbours were ranked after importance, were all 4 parameters had equal weight and divided in large and small harbours with a different effort depending on the harbour size. The 6 largest harbours (by quarter) received 4 visits per quarter and the small only 1 visit per quarter (this was changed from 2019 – before it was 3 visits by quarter and the 5 largest harbours). Each harbour is considered as a separate draw list. A sampling event list was conducted were all harbours had a preselected time for sampling and the time period for the harbour sampling event was for logistic reasons chosen to be a 14 days period. Not all stocks have been selected for each harbour and when a sampling event is conducted, in a given harbor, all stocks selected for that specific harbour is to be sampled if they are landed on the given day. For each species the minimum numbers of sorting boxes is sampled (1 boxes per sorting group, if present). If not all sorting sizes, within a given species, are present, or if not all species on the list have been landed on the given sampling day, there will not be sampled the following day, but first at the next planned sampled event to the harbour.

Dou to logistics the harbours have been divided in 3 areas according to the location of staff. One is in the northern Denmark (Hirtshals), one on Sjælland (Lyngby) and one on the Island Bornholm.

Figure 1. Harbours divided by areas.



As this system is not taken into account how important a given stock is, all stocks are sampled at equal level if present at the harbour, this gave a rather large sampling effort for all flatfish species (more fish per box) and a lower number of round fish. It was therefore introduced that only 2 flatfish per cm needed to be aged and weighted per box per visit.

Furthermore, stocks with a none analytic assessment (DLS stocks) was having an increased sampling effort by the new system as well. Therefore, a further differentiation was introduced were DLS stocks were only sampled in the large harbours 1 every quarter (table 2).

Table 2. Overview of assessment type.

Stock	DLS	Analytic
ANG-4	x	
CAT-4	x	
COD-21		x
COD-2224		x
COD-2532		x
COD-43AN		x
DAB-2232	x	
DAB-43A	x	
GUG-4	x	
HAD-43A		x
HER-2232		x
HER-3A		x
HKE-43A		x
LEM-43A	x	
LIN-43A	x	
PLE-2123		x
PLE-2432	x	
PLE-43AN		x
SAI-43A		x
TUR-4	x	
WHG-3A	x	
WIT-43A	x	

Presently, we have no system for selection of the boxes in the harbour.

Sampling plan for 2020

Each harbour has a sampling plan by quarter. A full list of numbers of sampling event by harbour can be found in annex 4.

Quarter	3	HUNDESTED

Date	stock	Area.	Sort. 1	Sort. 2	Sort. 3	Sort. 4	Sort. 5	IND SAMLER
Uge 34-35	VEST TORSK	22-24	1 ks.	1 ks.	1 ks.	1 ks.	1 ks.	Frank
TOTALT INDSAMLET			0	0	0	0	0	
Uge 34-35	ØST TORSK	25-32	1 ks.	1 ks.	1 ks.	1 ks.	1 ks.	Frank
TOTALT INDSAMLET			0	0	0	0	0	
Uge 34-35	KATTEGAT TORSK	21	1 ks.	1 ks.	1 ks.	1 ks.	1 ks.	Frank
TOTALT INDSAMLET			0	0	0	0	0	
Uge 34-35	RØDSPÆTTE	24-32	1 ks.	1 ks.	1 ks.	1 ks.		Frank
TOTALT INDSAMLET			0	0	0	0		

Example of sampling plan for Hundested harbour.

Processing of human consumption fish in the harbours

- Round fish: Length distribution is measured for all fish within the sorting group by cm per box. Individual weights for all fish and if possible both otoliths for every fish.
- Exception: As small cod and hake (commercial size sorting 3 and 4 for hake and size sorting 5, 6 and BMS are relatively alike in size structure a full box is not needed for sampling but 2 fish / cm / box is sampled.
- Flatfish Length distribution for all fish within the sorting group by cm. 2 fish by cm for individual weight measurements and for otoliths (both otoliths if possible). The flatfish processed for weight and age needs to by punched in as “ej rep” – not representive.
- All plaice and sole needs to be sexed since 2017

An illustration of how a length measurement needs to be conducted can be found in annex 1 and how otoliths needs to be stored in annex 2.

Human consumption Flounder and Sole collected in the observer program

Biological information from these two stocks is to be collected in the “at sea observer program”.

- Sole from area 20-21-22 has to be collected with 1 fish per cm per station (including human consumption sizes)

- Flounder from area 22-26 has likewise to be collected with 1 fish per cm group per station (including human consumption sizes).
- The fish needs to be punched in, on station level with all other information on that station (see observer manual).

Information needed from the vessels

For every sorting box sampled information is needed on:

Information	Eksempel
Sampling number:	26
Vessel length	12-24 m
Gear	Bundtrawl
Vessel ID.:	E 1279
Evt. makkerfartøjsnr.:	
Date for landing:	15. januar 2002
Landing harbour:	Hvide Sande
Gear code:	OTB
Mesh size	120 mm
Area:	IVb
ICES square:	38F5
Target species:	TOR

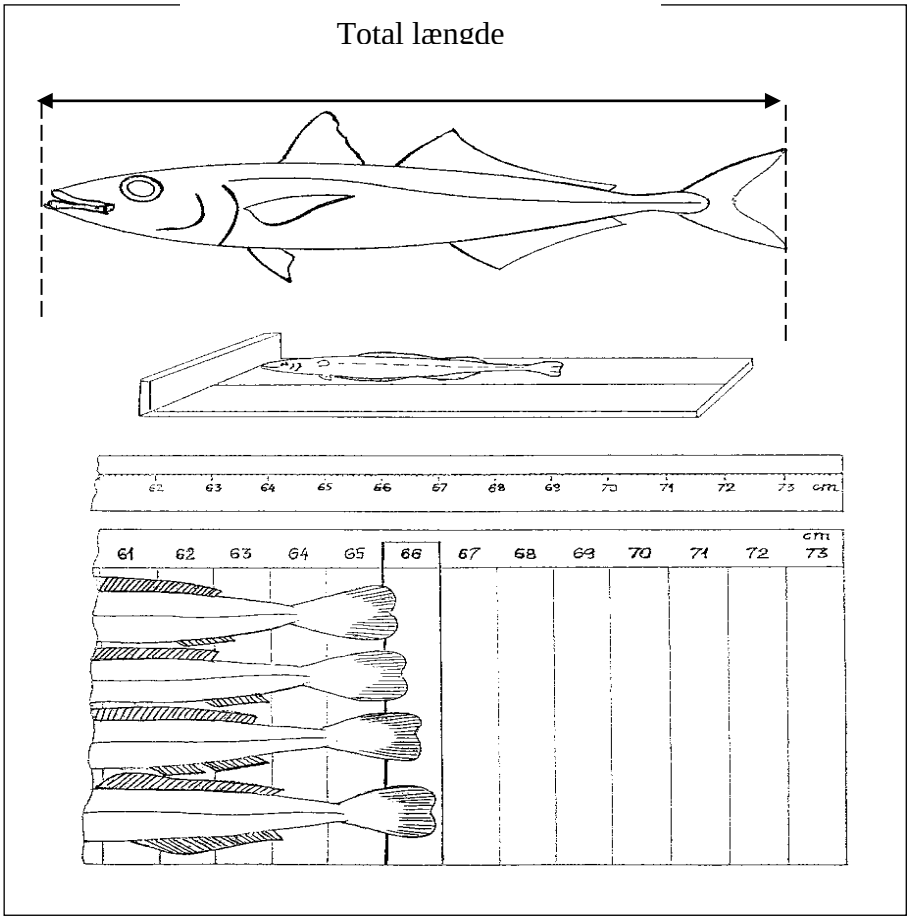
It is very important we have the correct information. If this information is uncertain the box should be discarded and another box with the relevant information present selected instead.

Special attention has to be on:

- Fishing area
- Gear type
- Catch date
- Logbook number

The template for the data information needed at the harbour visit is found in annex 3.

Annex 1. Length Measurements



Annex 2. Otoliths

It is important that the otoliths have correct labels, and fish number 16 needs to match fish 16 in the otolith tray. For round fish a tray with 18 holes are used. Remember to add information with vessel ID, date, species, Sorting group and number No. 1-18 (No. 19-36, No. 37-54, etc.). The information needs to go on the left side

Fartøj nr: Dato: Art: Sort: Nr. 1-18:	1	2	3	4	5	6	7	8	9
	10	11	12	13	14	15	16	17	18

For flatfish we use the black otolith trays with 50 holes. Same information needs to be attached.

Fartøj nr: Dato: Art: Sort: Nr. 1-50:	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35	36	37	38	39	40
	41	42	43	44	45	46	47	48	49	50

Annex 3. Template for sampling information at harbour sampling

STATION, LANDING – AUKTION

Togt: _____ Tur: _____ Station nr.: _____ Log nr.: _____
Journal nr.

Indsamlingsdato: __-__-__ Indsamlingshavn:_____
Landingsdato: __-__-__ Landingshavn:_____
Fangst fra farvand: ____ ICES sqr.: ____-_
Kutter nr.: ____

Fiskeritype (kon/ind.): _ _
Redskabs type: ___ (OBLIGATORISK***) Maskevidde: ___ mm helmaske

Indsamlet fra: 1 kendt skib ☐ Flere skibe ☐

Indsamler: ___ Analyseret af: ___

Art	Kategori (KON) (IND)	Sortering 1-2-3 etc.	Behandling (RH. etc.)	Køn	Antal fisk i Målepr.	Antal Enkeltf.	Trin 0		Ejrep./Rep.	Bemærkninger
							Opvejet vægt målepr.Kg (evt. enkeltfisk)	Købsvægt kg	Opvejet vægt enkeltfisk kg	

Ved Industriprøver:
Ankomstvægt:_____,____kg

Bemærkninger:

Annex 4. Numbers of sampling event per harbour site and stock in 2019

kvartal	havn	nati	geri	stock	art	fvd	to	anta	u25landing	pct_l	Ass	am_pr_
1	Hvide sande	DNK	2	COD-2224	TOR	22,23,24	462	1025		17.7	X	4
1	Hvide sande	DNK	2	DAB-2232	ISG	22,23,24,25	55	910		26.6	DLS	1
1	Hvide sande	DNK	2	PLE-2123	RSP	21,22,23	357	1254		28.2	X	4
1	Thyborøn	DNK	3	COD-2224	TOR	22,23,24	191	20	u25landinger	7.3	X	4
1	Gilleleje	DNK	4	COD-21	TOR	21	26	179		70.3	X	4
1	Gilleleje	DNK	4	HER-3A	SIL	20,21	584	35		100.0	X	4
1	Nexø	DNK	5	COD-2532	TOR	25,26	90	208		30.4	X	4
1	Nexø	DNK	5	PLE-2432	RSP	24,25	13	170		18.3	DLS	1
1	Fåborg	DNK	6	COD-2224	TOR	22,23,24	109	388		4.2	X	4
1	Fåborg	DNK	6	DAB-2232	ISG	22,23,24,25	13	359		6.2	DLS	1
1	Fåborg	DNK	6	PLE-2123	RSP	21,22,23	270	449		21.3	X	4
1	Bagenkop	DNK	7	COD-2224	TOR	22,23,24	455	564		17.5	X	4
1	Bagenkop	DNK	7	DAB-2232	ISG	22,23,24,25	91	550		43.9	DLS	1
1	Bagenkop	DNK	7	PLE-2123	RSP	21,22,23	432	643		34.1	X	4
1	Klintholm ha	DNK	8	COD-2224	TOR	22,23,24	191	106		7.3	X	1
1	Klintholm ha	DNK	8	HER-2232	SIL	22,23,24,25,26,27,2	830	34		13.0	X	1
1	Klintholm ha	DNK	8	PLE-2432	RSP	24,25	18	79		25.1	DLS	1
1	Strandby (no	DNK	10	COD-21	TOR	21	7	387		18.5	X	1
1	Skagen	DNK	12	HER-2232	SIL	22,23,24,25,26,27,2	1970	5	u25landinger	30.9	X	1
1	Tejn	DNK	13	COD-2532	TOR	25,26	30	58		10.0	X	1
1	Tejn	DNK	13	PLE-2432	RSP	24,25	21	55		30.3	DLS	1
1	Grenå	DNK	14	HER-2232	SIL	22,23,24,25,26,27,2	2528	14	u25landinger	39.6	X	1
1	Rønne	DNK	15	PLE-2432	RSP	24,25	10	95		14.1	DLS	1
1	Sassnitz	DEU	16	COD-2224	TOR	22,23,24	390	17	u25landinger	15.0	X	1
1	Kolobrzeg	POL	17	COD-2224	TOR	22,23,24	287	16	u25landinger	11.0	X	1
1	Darlowo	POL	18	COD-2532	TOR	25,26	55	3	u25landinger	18.6	X	1
1	Wladyzlowo	POL	19	COD-2532	TOR	25,26	67	3	u25landinger	22.5	X	1
1	Heiligenhafe	DEU	20	DAB-2232	ISG	22,23,24,25	20	12	u25landinger	9.5	DLS	1

2. quarter

kvartal	havn	nati	geri	stock	art	fvd	to	anta	u25landing	pct_l	Ass	am_pr_
2	Hvide sande	DNK	3	COD-2224	TOR	22,23,24	68	630		22.4	X	4
2	Hvide sande	DNK	3	DAB-2232	ISG	22,23,24,25	25	720		20.5	DLS	1
2	Hvide sande	DNK	3	PLE-2123	RSP	21,22,23	118	877		24.8	X	4
2	Nexø	DNK	5	COD-2532	TOR	25,26	148	209		21.3	X	4
2	Nexø	DNK	5	HER-2232	SIL	22,23,24,25,26,27,2	105	17	u25landinger	46.1	X	4
2	Gilleleje	DNK	6	COD-21	TOR	21	9	366		71.5	X	4
2	Gilleleje	DNK	6	PLE-2123	RSP	21,22,23	41	839		8.6	X	4
2	Bagenkop	DNK	7	COD-2224	TOR	22,23,24	16	280		5.4	X	4
2	Bagenkop	DNK	7	DAB-2232	ISG	22,23,24,25	45	500		37.5	DLS	1
2	Bagenkop	DNK	7	PLE-2123	RSP	21,22,23	171	518		36.0	X	4
2	Strandby (no	DNK	8	COD-21	TOR	21	2	265		15.8	X	1
2	Strandby (no	DNK	8	HER-3A	SIL	20,21	0	18	u25landinger	40.0	X	1
2	Klintholm ha	DNK	9	COD-2224	TOR	22,23,24	28	101		9.2	X	1
2	Klintholm ha	DNK	9	DAB-2232	ISG	22,23,24,25	7	58		6.1	DLS	1
2	Klintholm ha	DNK	9	PLE-2432	RSP	24,25	62	105		54.7	DLS	1
2	Rønne	DNK	10	COD-2224	TOR	22,23,24	38	290		12.6	X	1
2	Langø	DNK	11	COD-2224	TOR	22,23,24	37	153		12.0	X	1
2	Langø	DNK	11	DAB-2232	ISG	22,23,24,25	7	83		6.2	DLS	1
2	Langø	DNK	11	PLE-2123	RSP	21,22,23	30	151		6.3	X	1
2	Simrishamn	SWE	12	HER-2232	SIL	22,23,24,25,26,27,2	100	19	u25landinger	43.8	X	1
2	Vedbæk	DNK	13	COD-2224	TOR	22,23,24	15	153		4.8	X	1
2	Vedbæk	DNK	13	PLE-2123	RSP	21,22,23	18	178		3.8	X	1
2	Schaprode	DEU	15	COD-2224	TOR	22,23,24	41	11	u25landinger	13.6	X	1
2	Schaprode	DEU	15	PLE-2432	RSP	24,25	43	11	u25landinger	38.1	DLS	1
2	Wladyzlowo	POL	16	COD-2532	TOR	25,26	192	11	u25landinger	27.8	X	1
2	Skagen	DNK	17	HER-3A	SIL	20,21	0	4	u25landinger	43.3	X	1
2	Kolobrzeg	POL	18	COD-2532	TOR	25,26	154	8	u25landinger	22.3	X	1
2	Darlowo	POL	19	COD-2532	TOR	25,26	154	8	u25landinger	22.2	X	1
2	Årøsund	DNK	20	PLE-2123	RSP	21,22,23	16	63		3.3	X	1
2	Heiligenhafe	DEU	21	DAB-2232	ISG	22,23,24,25	13	4	u25landinger	11.1	DLS	1

3. quarter

kvartal	havn	nati	geri	stock	art	fvd	to	ant	u25landing	pct_	Ass	am_pr_
3	Hanstholm	DNK	1	HER-3A	SIL	20,21	462	4	u25landinger	40.8	X	4
3	Hvide sande	DNK	4	COD-2224	TOR	22,23,24	41	314		21.7	X	4
3	Hvide sande	DNK	4	DAB-2232	ISG	22,23,24,25	7	326		11.8	DLS	1
3	Hvide sande	DNK	4	PLE-2123	RSP	21,22,23	79	478		22.9	X	4
3	Strandby (no	DNK	5	COD-21	TOR	21	2	204		43.5	X	4
3	Klintholm ha	DNK	6	DAB-2232	ISG	22,23,24,25	14	77		23.2	DLS	1
3	Klintholm ha	DNK	6	PLE-2432	RSP	24,25	114	120		60.8	DLS	1
3	Gilleleje	DNK	7	COD-21	TOR	21	1	226		31.5	X	4
3	Gilleleje	DNK	7	PLE-2123	RSP	21,22,23	33	703		9.4	X	4
3	Skagen	DNK	8	COD-21	TOR	21	0	68		8.0	X	1
3	Skagen	DNK	8	HER-3A	SIL	20,21	528	11	u25landinger	46.6	X	1
3	Rønne	DNK	9	COD-2224	TOR	22,23,24	14	145		7.5	X	1
3	Rønne	DNK	9	COD-2532	TOR	25,26	17	21	u25landinger	40.0	X	1
3	Bagenkop	DNK	10	DAB-2232	ISG	22,23,24,25	20	210		33.1	DLS	1
3	Bagenkop	DNK	10	PLE-2123	RSP	21,22,23	126	255		36.5	X	1
3	Vedbæk	DNK	11	COD-2224	TOR	22,23,24	32	161		17.2	X	1
3	Vedbæk	DNK	11	PLE-2123	RSP	21,22,23	21	160		6.2	X	1
3	Nexø	DNK	12	HER-2232	SIL	22,23,24,25,26,27,2	25	9	u25landinger	15.8	X	1
3	Simrishamn	SWE	13	HER-2232	SIL	22,23,24,25,26,27,2	126	4	u25landinger	79.6	X	1
3	Skudehavner	DNK	14	COD-2224	TOR	22,23,24	13	110		7.2	X	1
3	Sletten	DNK	16	COD-2224	TOR	22,23,24	18	97		9.4	X	1
3	Schaprode	DEU	17	DAB-2232	ISG	22,23,24,25	14	11	u25landinger	23.2	DLS	1
3	Schaprode	DEU	17	PLE-2432	RSP	24,25	52	11	u25landinger	27.5	DLS	1
3	Grenå	DNK	18	PLE-2123	RSP	21,22,23	13	301		3.9	X	1
3	Dragør	DNK	19	COD-2224	TOR	22,23,24	26	80		13.7	X	1
3	Darlowo	POL	20	COD-2532	TOR	25,26	18	1	u25landinger	44.2	X	1
3	Langø	DNK	21	COD-2224	TOR	22,23,24	12	66		6.4	X	1
3	Spodsbjerg	DNK	22	PLE-2123	RSP	21,22,23	11	101		3.3	X	1

4. quarter

kvartal	havn	nati	geri	stock	art	fvd	to	ant	u25landing	pct_	Ass	am_pr_
4	Gilleleje	DNK	3	COD-21	TOR	21	2	171		18.1	X	4
4	Gilleleje	DNK	3	HER-2232	SIL	22,23,24,25,26,27,2	445	18	u25landinger	16.1	X	4
4	Gilleleje	DNK	3	HER-3A	SIL	20,21	253	16	u25landinger	99.0	X	4
4	Gilleleje	DNK	3	PLE-2123	RSP	21,22,23	31	413		9.1	X	4
4	Strandby (no	DNK	5	COD-21	TOR	21	6	330		70.9	X	4
4	Strandby (no	DNK	5	PLE-2123	RSP	21,22,23	18	473		5.3	X	4
4	Bagenkop	DNK	6	COD-2224	TOR	22,23,24	29	161		9.3	X	4
4	Bagenkop	DNK	6	DAB-2232	ISG	22,23,24,25	32	242		63.2	DLS	1
4	Bagenkop	DNK	6	PLE-2123	RSP	21,22,23	129	278		37.9	X	4
4	Rønne	DNK	7	PLE-2432	RSP	24,25	100	167		39.7	DLS	1
4	Hvide sande	DNK	8	COD-2224	TOR	22,23,24	18	53		5.8	X	1
4	Dragør	DNK	9	COD-2224	TOR	22,23,24	108	306		34.0	X	1
4	Vedbæk	DNK	10	COD-2224	TOR	22,23,24	51	162		16.2	X	1
4	Nexø	DNK	11	COD-2532	TOR	25,26	0	12	u25landinger	100.0	X	1
4	Fåborg	DNK	12	DAB-2232	ISG	22,23,24,25	2	107		3.8	DLS	1
4	Fåborg	DNK	12	PLE-2123	RSP	21,22,23	23	124		6.8	X	1
4	Simrishamn	SWE	14	HER-2232	SIL	22,23,24,25,26,27,2	838	27		30.4	X	1
4	Klintholm ha	DNK	15	DAB-2232	ISG	22,23,24,25	3	40		5.0	DLS	1
4	Klintholm ha	DNK	15	PLE-2432	RSP	24,25	50	46		20.0	DLS	1
4	Mukran	DEU	16	HER-2232	SIL	22,23,24,25,26,27,2	1096	1	u25landinger	39.8	X	1
4	Skudehavner	DNK	17	COD-2224	TOR	22,23,24	30	153		9.6	X	1
4	Spodsbjerg	DNK	18	COD-2224	TOR	22,23,24	13	127		4.1	X	1
4	Spodsbjerg	DNK	18	DAB-2232	ISG	22,23,24,25	3	109		6.5	DLS	1
4	Spodsbjerg	DNK	18	PLE-2123	RSP	21,22,23	19	148		5.7	X	1
4	Grenå	DNK	19	PLE-2123	RSP	21,22,23	29	194		8.7	X	1
4	Sletten	DNK	20	COD-2224	TOR	22,23,24	15	99		4.8	X	1
4	Kolobrzeg	POL	21	PLE-2432	RSP	24,25	32	4	u25landinger	12.9	DLS	1
4	Schaprode	DEU	22	DAB-2232	ISG	22,23,24,25	2	6	u25landinger	3.3	DLS	1
4	Schaprode	DEU	22	PLE-2432	RSP	24,25	30	6	u25landinger	12.0	DLS	1
4	Bønnerup	DNK	23	PLE-2123	RSP	21,22,23	22	86		6.5	X	1

Reference

ICES working group WKPICS2