WORKING GROUP ON INTERNATIONAL DEEP PELAGIC ECOSYSTEM SURVEYS (WGIDEEPS)

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Contents

i Executive summary

The Working Group on International Deep Pelagic Ecosystem Surveys (WGIDEEPS) plans, conducts and reports on the international trawl-acoustic surveys on pelagic redfish in the Irminger and Norwegian seas.

The international trawl-acoustic survey (IDEEPS) on pelagic redfish in the Norwegian Sea in July/August 2022 will be conducted by Norway with one research vessel only. The detailed planning of the survey was presented and discussed and has been agreed by all Member Countries of the working group. As only one research vessel is conducting the survey, the entire distribution of pelagic redfish in the Norwegian Sea cannot be covered.

The survey will cover the part of the *Sebastes mentella* stock in the Norwegian Sea between 70°N and 80°N and bounded by the 400 m isobath in the East and the Mohn – Knipovich ridge in the West. The area comprises parts of the Norwegian EEZ, the Svalbard Fisheries Protection Zone and adjacent international waters. The area north of 76.33°N is optional, depending on the available time. The survey is a trawl-acoustic survey, using a Simrad EK80 echosounder and a Gloria 2048 HO pelagic trawl with a multisampler with three codends to resolve the distribution of beaked redfish in the water column. This year the Deep Vision camera system will be included for the first time, to afford counting and length measurements. In later years this should help to avoid the killing more fish than necessary for aging and maturity staging.

It was decided to incorporate the manual of the Norwegian Sea survey into SISP 11 – IDEEPS VI, which currently only contains the information on the survey in the Irminger Sea and adjacent waters.

Also, it was decided that in the future the survey data of IDEEPS should be uploaded to the ICES Acoustic Data Portal instead of DATRAS, because the Acoustic Data Portal is able to handle not only the biological trawl data but also the hydroacoustic data.

ii Expert group information

Expert group name	Working group on International Deep Pelagic Ecosystem Surveys (WGIDEEPS)
Expert group cycle	Multiannual fixed term
Year cycle started	2020
Reporting year in cycle	3/3
Chair(s)	Hannes Höffle, Norway
	Matthias Bernreuther, Germany
Meeting venue(s) and dates	25-27 August 2020, Virtual meeting (4 participants)
	16-19 February 2021, Virtual meeting (6 participants)
	14-16 September 2021, Virtual meeting (5 participants)
	09-11 February 2022, Virtual meeting (5 participants) Autumn 2022, TBD

1 Planning of the international trawl/acoustic survey on redfish in the Norwegian Sea in July/August 2022

1.1 Vessels, timing and survey area

The main objective of this survey is the trawl-acoustic assessment of the pelagic component in the open Norwegian Sea of the Northeast-Arctic stock of beaked redfish (*Sebastes mentella)*. Furthermore, the survey is to collect data in support of integrated ecosystem management in the open Norwegian Sea, as part of the international deep pelagic ecosystem surveys (ICES-WGIDEEPS). As in previous surveys since 2009, Norway will be the only participating country.

The survey area extends from 70°N to 80°N latitudinally and is bounded by the 400 m line along the shelf edge in the East and by the Mohn - Knipovich ridge in the West. The northern part of the survey 76.33°N-80°N is optional depending on the available time and a further extension to either the North or South can be considered. This survey area covers part of the distribution of *Sebastes mentella* in the Norwegian Sea as observed by past scientific surveys and commercial catches. The survey will operate in the Norwegian EEZ and adjacent international waters, as well as the Svalbard Fisheries Protection Zone.

The survey will start and end in Tromsø, on 22nd July and 13th August, respectively. The early days of the survey are reserved for gear testing and training of personnel in the use of the Deep Vision camera system. The vessel used for the survey is R/V G. O. Sars operated by the Institute of Marine Research, Norway (see Annex 3 for further information). Table 1 and Figure 1 in Annex 4 present the preliminary survey track and its turning points, recreating the planned track for the 2019 survey. As the 2022 survey includes several days for gear-testing and training at the beginning, this track will be adapted to the available time frame. The length of the currently planned survey track is 2,812 nautical miles (NM), all of it covered by acoustic registrations.

1.2 Acoustic sampling

The technical specifications for acoustics are provided in Annex 5. Acoustic sampling is conducted with ping interval setting of ~ 1s. This may lead to ocean floor ghost echoes in areas deeper than ~ 750 m, in such cases, this should be adjusted in an ad hoc fashion to remove ghost echoes from the layer containing redfish. This sampling rate also implies that fish echoes will be only recorded at depths of less than ~750 m. Calibration will be performed before this survey (2022109) and before the next (2022110) using a standard calibration sphere, following recommendations from Foote et al. (1987).

The target strength (TS) for *S. mentella* is defined using the following size-dependent relationship: TS = 20logL -69.6. This corresponds to the recommended TS equation with fixed slope from the workshop on the Determination of Acoustic Target Strength of Redfish (WKTAR; ICES 2010). Hydroacoustics will be registered and stored for the entire duration of the cruise down to at least 750 m (or bottom depth if it is less than 750 m). Scrutinizing will be conducted following the protocol described in the report of the workshop on hydro-acoustic scrutinizing in the Norwegian Sea and adopted by the WGRS working group (Planque et al. 2009, ICES 2013). The main steps are summarized below:

Echo integration is performed using LSSS software with Sv thresholding to remove low energy echoes which result from smaller targets in the Deep Scattering Layer (DSL). Integration is done in a series of depth layers selected based on vertical structures visible on the echogram and the information for the nearest trawl catches. In each layer, the threshold is raised to a level where the DSL (or other 'background' layer) can no longer be seen. The s_A is then allocated to fish targets and divided between fish species according to s_A proportions in the nearest trawl hauls (s_A proportions are provided by the 'trawl module' of LSSS based on species quantities and length distribution in the catch). The threshold is then brought back to -80 dB and the additional s_A is allocated to the category 'plankton'.

The following acoustic categories are used: redfish (*S. mentella*), blue whiting, herring, plankton, other, cod, greater argentine, and saithe. The 'plankton' category comprises all small targets (e.g. myctophids, shrimps), including ribbon barracudina (*Arctozenus risso*). The category 'other' comprises all other large targets which are not identified (i.e. other fish species).

Possible sources of error such as ghost bottom echoes or 'noisy pings' are removed either by 'schooling them out' (i.e. by drawing a school object which is removed from the layer analysis) or by adapting the layer contour. The fraction of the layer removed from the analysis is allocated the mean s_A of the analysed fraction. Scrutinized sections are stored to the LSSS database with a resolution of 10 m (vertical) by 1 NM (horizontal).

1.3 Trawl samples

Trawl hauls will be used for species and size composition in conjunction with hydroacoustics. The trawling will be conducted using a Gloria 2048 HO (high opening) trawl. The detailed specifications for trawl rigging are provided in Annex 6. The trawl will be equipped with a multisampler with 3 codends fitted with 24 mm inner net and a Deep Vision camera system between the trawl and the multisampler. The multisampler will be programmed for fixed sampling durations (30') at prespecified depth horizons (i.e. horizontal trawling). Each codend will be analysed separately and be given an individual serial number, i.e. 3 serial numbers per haul. The number of trawls will be between 25 and 30. A SAIV-CTD, inside its dedicated metallic frame, will be attached to the trawl headline to record temperature, salinity and depth at 2 Hz for the duration of trawling. Data will be downloaded and archived at least once a day. A second SAIV will be on board as a backup.

1.4 Biological sampling

The main target for this survey is beaked redfish (*S. mentella*). Up to a representative 100 individuals will be length measured out of each codend (3 per haul) and up to 30 of these will be examined for weight, sex and maturity stage (stages in Annex 7). Otoliths will be taken for aging and stored in envelops without data on the individual beyond species, serial – and individual numbers. The first five individuals will be photographed in a standardised manner (Annex 8). Due to a backlog of genetic samples, fin clips of the 10 first individuals may not be taken on this survey.

Of golden redfish (*Sebastes norvegicus*), all individuals are to be sampled like the 30 individual beaked redfish and also photographed. In addition, fin clips for genetics are to be taken of all individuals and preserved in alcohol.

Up to 30 individuals per station of greenland halibut (*Rheinhardtius hippoglossoides*) are to be sampled fully, with those carrying tags being frozen as individuals, i.e. one individual per bag.

All Elasmobranchs are to be length measured and sexed with full individual samples, including genetics, taken for thorny ray (*Amblyraja radiata*), spinytail skate (*Bathyraja spinicauda*), round ray

(*Rajella fyllae*), Norwegian skate (*Dipturus nidarosiensis*), Arctic skate (*Amblyraja hyperborea*), rabbit fish (*Chimaera monstrosa*), spiny dogfish (*Squalus acanthias*), velvet belly lanternshark (*Etmopterus spinax*) and blackmouth catshark (*Galeus melastomus*). Flapper skate (*Dipturus intermedius*) is to be released if alive or frozen whole if dead or dying. Skate eggs are to be registered and frozen.
For analyses of pollutants and nutrients a maximum of five representative samples, from catches over 2 kg, of abundant mesopelagic species (e.g. glacier lanternfish (*Benthosema glaciale*), pearlside (*Maurolicus muelleri*) and spotted barracudina (*Arctozenus risso*)) shall be preserved for analyses of pollutants and nutrients. These samples shall consist of a minimum of 25 fish or have a minimum weight of 30 g.
All other fish and cephalopod species are to be identified to species level, total catch weight and numbers are to be recorded and up to 30 individuals per species and serial number are to be length measured. Individuals of rare species and those that cannot be identified to species shall be preserved for later identification and educational purposes.

2 ICES Survey Protocols SISP 11 – IDEEPS VI – Update

The working group was informed by ICES Editor Ruth Anderson in December 2021 that the IDEEPS survey protocol is due an update by the end of the current Work Plan, which will end in 2022. The group decided that during this update procedure the Norwegian Sea survey should be included in the current SISP 11 – IDEEPS VI (ICES 2015). So far, SISP 11 only contains the information on the International Deep Pelagic Ecosystem Survey in the Irminger Sea and adjacent waters and the current update process was considered as a good opportunity to incorporate the Norwegian Sea survey in the existing survey protocol.

Since both surveys share the same aims but partially differ in e.g. fishing depths and cruise track planning, it was decided to split the SISP in two parts, one describing the Irminger Sea and adjacent waters survey and the other one describing the Norwegian Sea survey.

To start the process of updating and the publication in TIMES, the group will submit a publication resolution to SCICOM before the end of 2022.

3 Upload of Survey data to ICES Acoustic Data Portal

One of the recurring terms of reference of the working group is the finalisation of the transfer of trawl data from the International Deep Pelagic Ecosystem Surveys, coordinated by this group to ICES DATRAS database. One drawback of the transfer of IDEEPS survey data was identified in the lack of the ability of DATRAS database to accept hydroacoustic data. During the first meeting of the group in 2021 (ICES 2021), Hjalte Parner from the ICES Data Centre presented the ICES Acoustic Data Portal to the working group.

During this year´s online meeting (WGIDEEPS 2022-1), the advantages and disadvantages of ICES DATRAS and the ICES Acoustic Data Portal were discussed and the decision was reached that in the future the data should be uploaded to ICES Acoustic Data Portal instead of DATRAS. The reasoning for this step is that the Acoustic Data Portal is able to handle both biological trawl data and hydroacoustic data. In order to avoid duplication of work, it still needs to be clarified whether the already to DATRAS uploaded data can be transferred to the Acoustic Data Portal.

4 References

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Annex 1: List of participants

Name	Institute	Country (of institute)	Email
Alexey Astakhov	Atlantic Branch of the Russian Federal Research Institute of Fisheries and Oceanography (AtlantNIRO)	Russian Federation	astakhov@atlantniro.ru
Aleksei Rolskii	Polar Branch of the Russian Federal Research Institute of Fisheries and Oceanography (PINRO named after N.M. Knipovich)	Russian Federation	rolskiy@pinro.ru
Matthias Bernreuther (co-chair)	Thünen Institute of Sea Fisheries	Germany	matthias.bernreuther@thuenen.de
Hannes Höffle (co-chair)	Institute of Marine Research	Norway	hannes.hoffle@hi.no
Shale Pettit Rosen (chair-invited)	Institute of Marine Research	Norway	shale.rosen@hi.no

Annex 2: Resolutions

WGIDEEPS - Working Group on International Deep Pelagic Ecosystem Survey

2019/FT/EOSG04 A **Working Group on International Deep Pelagic Ecosystem Surveys** (WGIDEEPS), chaired by Hannes Höffle, Norway, and Matthias Bernreuther, Germany, will work on ToRs and generate deliverables as listed in the Table below.

	Meeting dates	Venue	Reporting details	Comments (change in Chair, etc.)
Year 2020	25-27 August	Online Meeting	E-evaluation by 24 September 2020 to ACOM-SCICOM	Kristján Kristinsson as outgoing chair.
Year 2021	16-19 February	Online Meeting	Interim report by 15 March 2021 to ACOM-SCICOM	
Year 2021	14-16 September	Online Meeting	Interim report by 14 October 2021 to ACOM-SCICOM	
Year 2022	9-11 February	Online Meeting	Interim report by 1st March 2022 to ACOM-SCICOM	
Year 2022	By correspondence		Final report by 15 September 2022 to ACOM-SCICOM	

ToR descriptors[1]

ToR	Description	Background	Science plan codes	Duration	Expected Deliverables
a	Evaluate calculation of biomass and abundance indices derived from the trawl method in the Irminger Sea.	The mehtod of calculating biomass and abundance indices from the trawl data has been based on convertion of the trawl data into acoustic values. This method needs to be evaluated and other methods to be explored.	3.2	Year 1 (2020)	Datras data product developed in cooperation with Data Centre and TAF

[1] Avoid generic terms such as "Discuss" or "Consider". Aim at drafting specific and clear ToR, the delivery of which can be assessed

	b	Finalise transfer of trawl survey data from international deep pelagic ecosystem surveys coordinated by the group to ICES DATRAS databases	Data are now stored by individual nations/participants. ICES has committed to a fully transparent and documented quality assurance framework for all data products and assessment results derived from data collated within the ICES working groups, this un-derpins agreements with all the recipients of ICES advice.	3.2	Year 1 (2020)	Inclusion of data in datras
c		Set up a formal procedure for the use and transfer of Norwegian Sea survey data to AFWG and WGINOR expert groups	There is currently no agreed format and standard on how the data collected by WGIDEEPS should be transfered to relevant assessment EGs.	3.1, 3.2	Year 1 (2020)	TAF proceedure for formally including survey data in assessments.
d		Coordinate the international deep pelagic ecosystem survey with special emphasis on redfish to be carried out in the Irminger Sea and adjacent waters in June/July 2021	The WG has been responsible for the planning of the international trawl/acoustic surveys on pelagic redfish (*Sebastes mentella*) in the Irminger Sea and adjacent waters since 1994 and producing reports on the survey results and outcomes.	3.1, 3.2	Year 2 (January meeting)	
e		Report on the outcome of the Irminger Sea survey	a) Support sound, credible, timely, peer-reviewed, and integrated scientific advice on fishery management and the protection of the marine environment. b) Redfish indices are being used by assessment working groups.	3.1, 3.2	Year 2 (August meeting)	WGIDEEPS 2021 – 2 report chapter 1 September 2021 SCICOM

f	Coordinate the international deep pelagic ecosystem survey with special emphasis on redfish to be carried out in the Norwegian Sea and adjacent waters in August 2022	The WG has been responsible for the planning of the international trawl/acoustic surveys on pelagic redfish (*Sebastes mentella*) in the Norwegian Sea since 2008 and corresponding reports on the survey results.	3.1, 3.2	Year 3 (January meeting)	WGIDEEPS 2022 – 1 report 1 March 2022 SCICOM
g	Report on the outcome of the 2022 Norwegian Sea survey	a) Support sound, credible, timely, peer-reviewed, and integrated scientific advice on fishery management and the protection of the marine environment. b) Redfish indices are being used by assessment working groups.	3.1, 3.2	Year 3	WGIDEEPS 2022 – 2 report chapter 15 September 2022 SCICOM

Summary of the Work Plan

Year 1	CARRY OUT TOR A-C
Year 2	Carry out ToR d-e
Year 3	Carry out ToR f-g

Supporting information

Priority	Essential, primary basis for the advice on the stock status of pelagic redfish in the Irminger Sea and adjacent waters and in the Norwegian Sea.
Resource requirements	N/A
Participants	Less than 12 participants (incl. the cruise leaders of each vessel and the principle experts involved in abundance and biomass calculations and deep sea ecology).
Secretariat facilities	N/A
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	NWWG, AFWG, WGDEC
Linkages to other committees or groups	SCICOM, WGOH, WGBIODIV, WKFAST, WGISDAA, ICES data centre
Linkages to other organizations	NAFO, NEAFC

Annex 3: Contact information on the survey vessel

Name: G.O. Sars

IMO No: 8915768	MMSI: 251507000	Year built: 2003
Flag: Norway	Homeport: Bergen	Call Sign: LDGJ
Tel.: +4755906440	Iridium: +881 622 463 404	ICES-code: GOS

Annex 4: Cruise track

Table 1: Coordinates of 97 navigational turning points in order of their occurrence on the survey track in the 2019 survey. The track for the 2022 survey will be based on this plan.

#	Longitude	Latitude	#	Longitude	Latitude	#	Longitude	Latitude
1	18° 59.78' E	69° 40.77' N	34	13° 16.41' E	75° 11.78' N	67	09° 41.29' E	74° 28.93' N
2	06° 00.33' E	70° 20.00' N	35	11° 44.41' E	75° 25.63' N	68	11° 14.38' E	74° 16.14' N
3	04° 37.41' E	70° 24.38' N	36	10° 09.61' E	75° 38.88' N	69	12° 45.00' E	74° 02.72' N
4	03° 13.94' E	70° 28.13' N	37	08° 31.99' E	75° 51.50' N	70	14° 13.15' E	73° 48.69' N
5	01° 49.98' E	70° 31.23' N	38	06° 51.57' E	76° 03.45' N	71	15° 38.82' E	73° 34.09' N
6	00° 25.63' E	70° 33.68' N	39	06° 49.54' E	76° 08.43' N	72	15° 25.02' E	73° 15.14' N
7	01° 45.40' E	70° 44.45' N	40	07° 53.36' E	76° 27.26' N	73	13° 50.33' E	73° 08.30' N
8	03° 06.56' E	70° 54.63' N	41	09° 00.10' E	76° 45.81' N	74	12° 16.93' E	73° 00.75' N
9	04° 29.07' E	71° 04.22' N	42	10° 09.93' E	77° 04.07' N	75	10° 44.92' E	72° 52.51' N
10	05° 52.88' E	71° 13.19' N	43	11° 23.01' E	77° 22.01' N	76	09° 14.39' E	72° 43.60' N
11	07° 17.93' E	71° 21.53' N	44	11° 12.88' E	77° 31.78' N	77	07° 45.4' E	72° 34.03' N
12	08° 44.16' E	71° 29.23' N	45	10° 01.77' E	77° 48.74' N	78	06° 18.02' E	72° 23.82' N
13	10° 11.49' E	71° 36.28' N	46	08° 47.39' E	78° 05.39' N	79	04° 52.30' E	72° 12.99' N
14	11° 39.86' E	71° 42.66' N	47	07° 29.57' E	78° 21.72' N	80	03° 28.28' E	72° 01.56' N
15	13° 09.17' E	71° 48.36' N	48	06° 08.14' E	78° 37.68' N	81	04° 55.85' E	71° 56.19' N
16	14° 39.33' E	71° 53.37' N	49	06° 02.62' E	78° 54.56' N	82	06° 22.54' E	71° 50.18' N
17	16° 10.25' E	71° 57.68' N	50	06° 07.46' E	78° 56.60' N	83	07° 48.26' E	71° 43.53' N
18	16° 04.66' E	72° 11.31' N	51	09° 05.37' E	78° 41.23' N	84	09° 12.94' E	71° 36.25' N
19	14° 37.79' E	72° 24.93' N	52	08° 09.16' E	78° 19.21' N	85	10° 36.50' E	71° 28.37' N
20	13° 08.78' E	72° 37.91' N	53	07° 16.30' E	77° 57.04' N	86	11° 58.88' E	71° 19.88' N
21	11° 37.67' E	72° 50.22' N	54	06° 26.52' E	77° 34.72' N	87	13° 20.04' E	71° 10.81' N
22	10° 04.49' E	73° 01.84' N	55	06° 30.10' E	77° 21.07' N	88	14° 39.91' E	71° 01.17' N
23	08° 29.30' E	73° 12.76' N	56	08° 13.26' E	77° 08.20' N	89	15° 58.47' E	70° 50.96' N
24	06° 52.16' E	73° 22.93' N	57	09° 53.04' E	76° 54.70' N	90	17° 15.66' E	70° 40.22' N
25	07° 20.66' E	73° 34.53' N	58	11° 29.44' E	76° 40.60' N	91	17° 15.69' E	70° 39.99' N
26	08° 44.28' E	73° 47.13' N	59	13° 02.53' E	76° 25.92' N	92	16° 02.17' E	70° 36.96' N
27	10° 09.98' E	73° 59.19' N	60	14° 32.35' E	76° 10.71' N	93	14° 49.05' E	70° 33.44' N
28	11° 37.74' E	74° 10.67' N	61	14° 25.25' E	75° 56.09' N	94	13° 36.39' E	70° 29.44' N
29	13° 07.53' E	74° 21.56' N	62	12° 43.51' E	75° 41.20' N	95	12° 24.24' E	70° 24.96' N
30	14° 39.31' E	74° 31.84' N	63	11° 05.22' E	75° 25.63' N	96	11° 12.64' E	70° 20.00' N

31	16° 13.03' E	74° 41.49' N	64	09° 30.36' E	75° 09.41' N	97	18° 59.78' E	69° 40.77' N
32	16° 12.04' E	74° 42.36' N	65	07° 58.84' E	74° 52.59' N			
33	14° 45.61' E	74° 57.34' N	66	08° 05.74' E	74° 41.07' N			

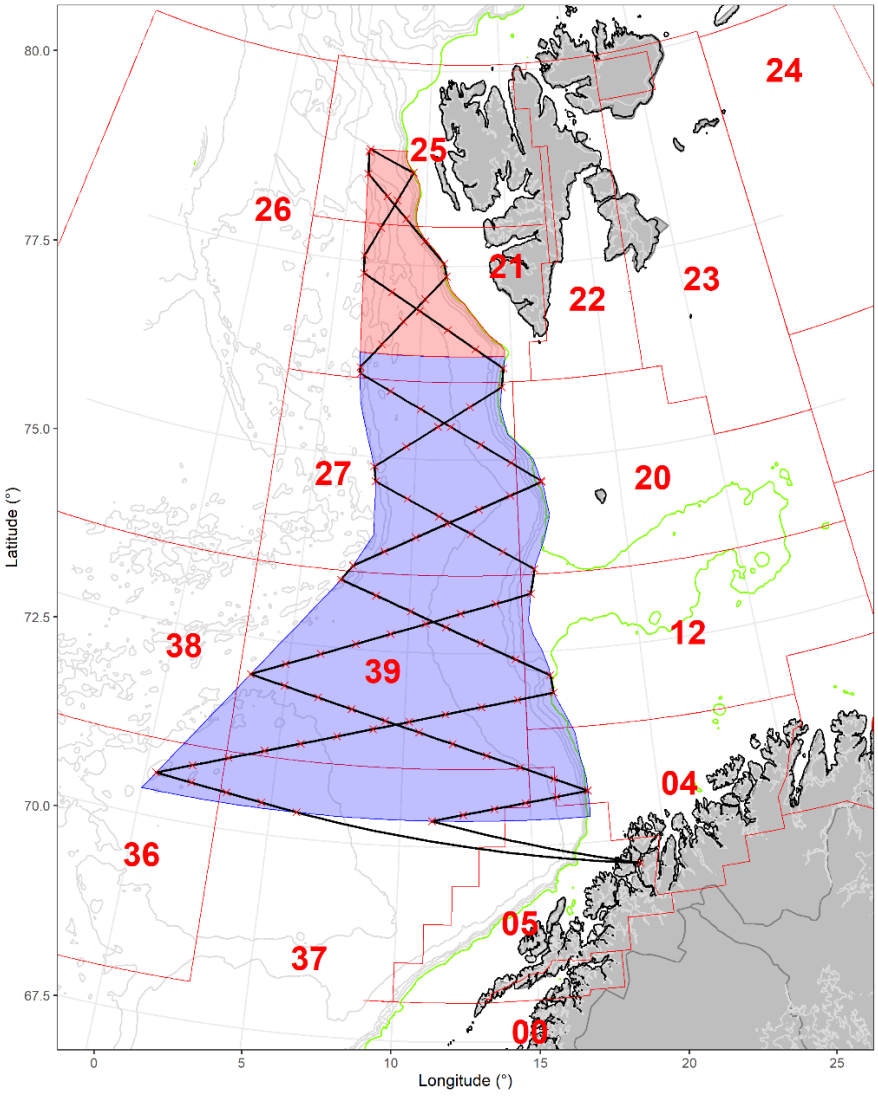


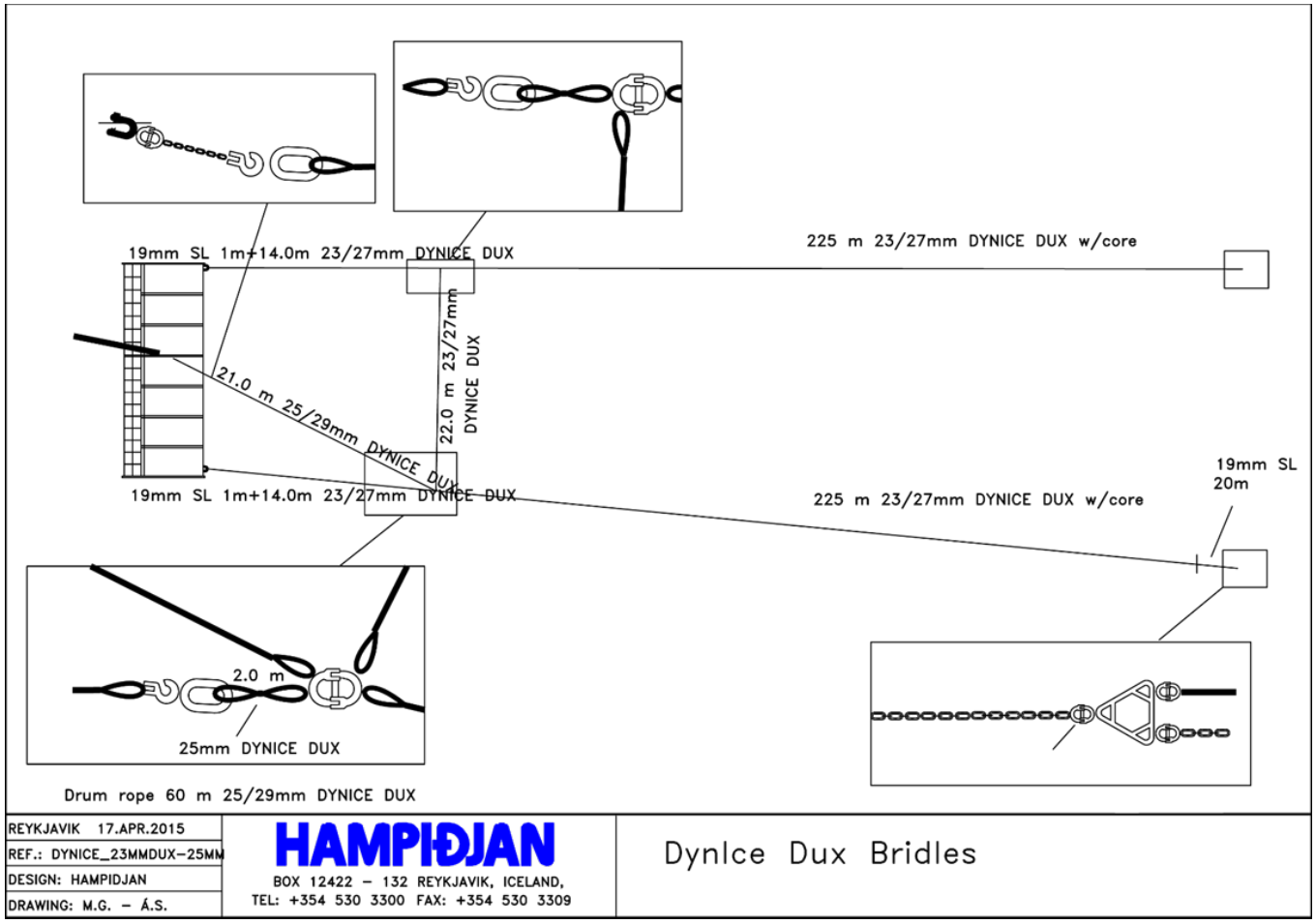
Figure 1: Planned cruise track of the 2019 survey, the 2022 survey will be based on. The blue polygon is the core survey area with the cruise track to the north, in the red polygon, being optional. X indicate navigational turning points. Coordinates are given in Tables 1 (turning points). The green contour is the 400 m isobath. Numbered areas outlined in red are the administrative areas defined by Fiskeridirektoratet.

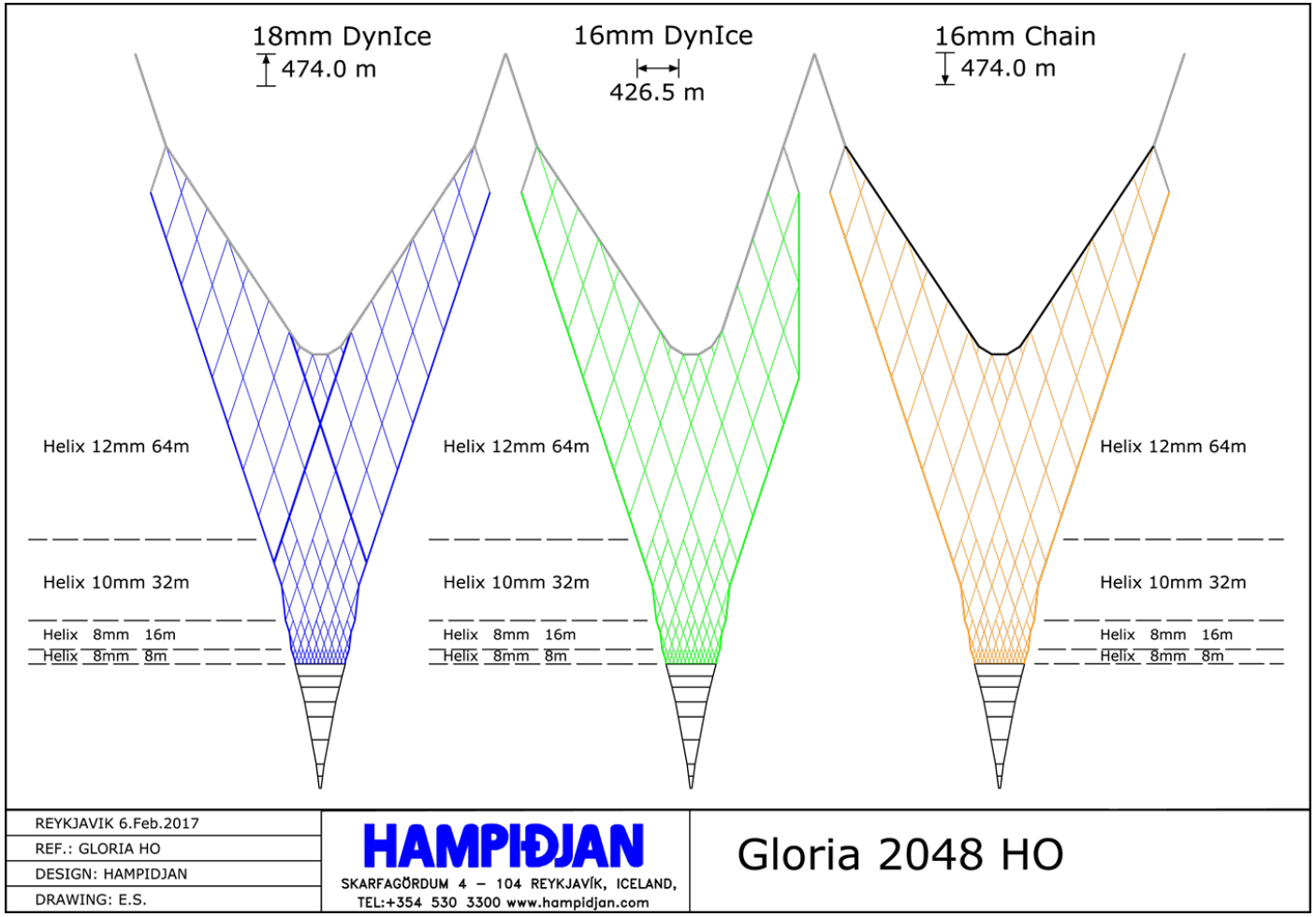
Annex 5: Acoustic specifications

The vessel carries a Simrad EK80 scientific echo sounder, operating on 18, 38, 70, 120, 200 and 333 kHz. The parameter settings should follow the following specifications:

- Transducer: ES38-7 or equivalent (split-beam)
- Primary frequency: 38 kHz
- Pulse length: 1 ms
- Beam angle: 7 degrees
- Transmit Power: 2 kW

Annex 6: Trawl rigging




18mm DynIce
474.0 m
16mm DynIce
426.5 m
16mm Chain
474.0 m
Helix 12mm 64m
Helix 10mm 32m
Helix 8mm 16m
Helix 8mm 8m
Helix 12mm 64m
Helix 10mm 32m
Helix 8mm 16m
Helix 8mm 8m
Helix 12mm 64m
Helix 10mm 32m
Helix 8mm 16m
Helix 8mm 8m
REYKJAVIK 6.Feb.2017
REF.: GLORIA HO
DESIGN: HAMPIDJAN
DRAWING: E.S.
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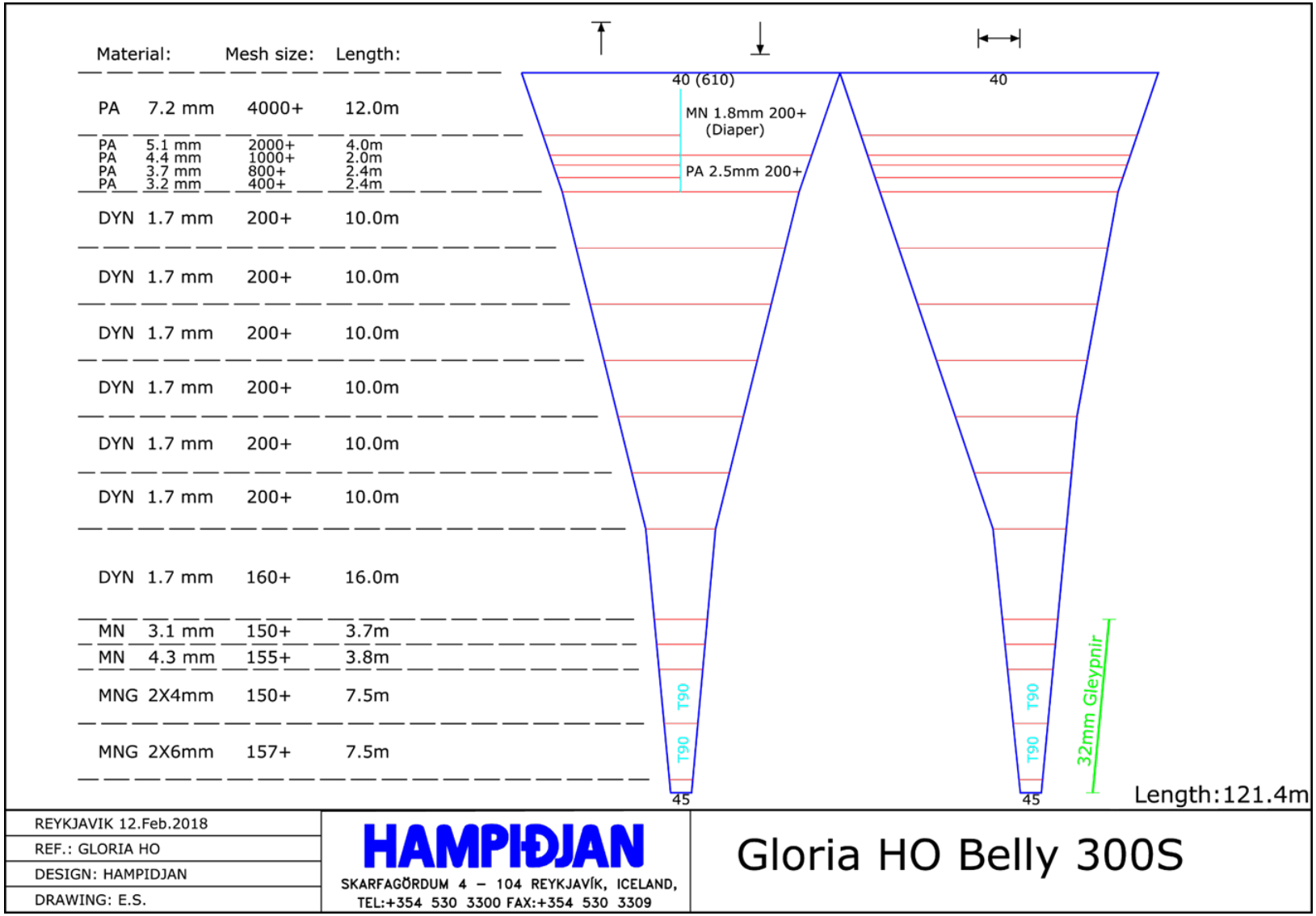
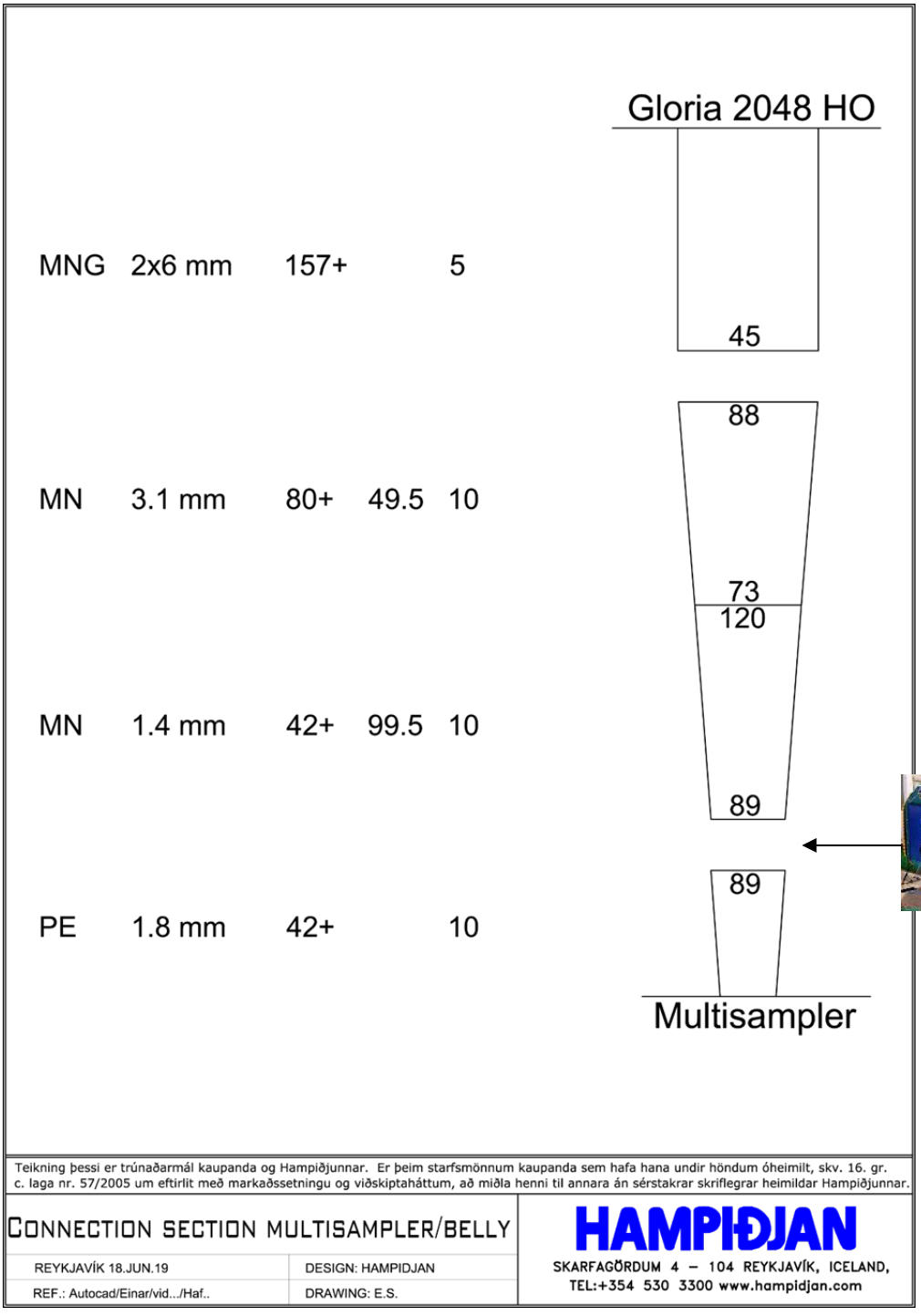
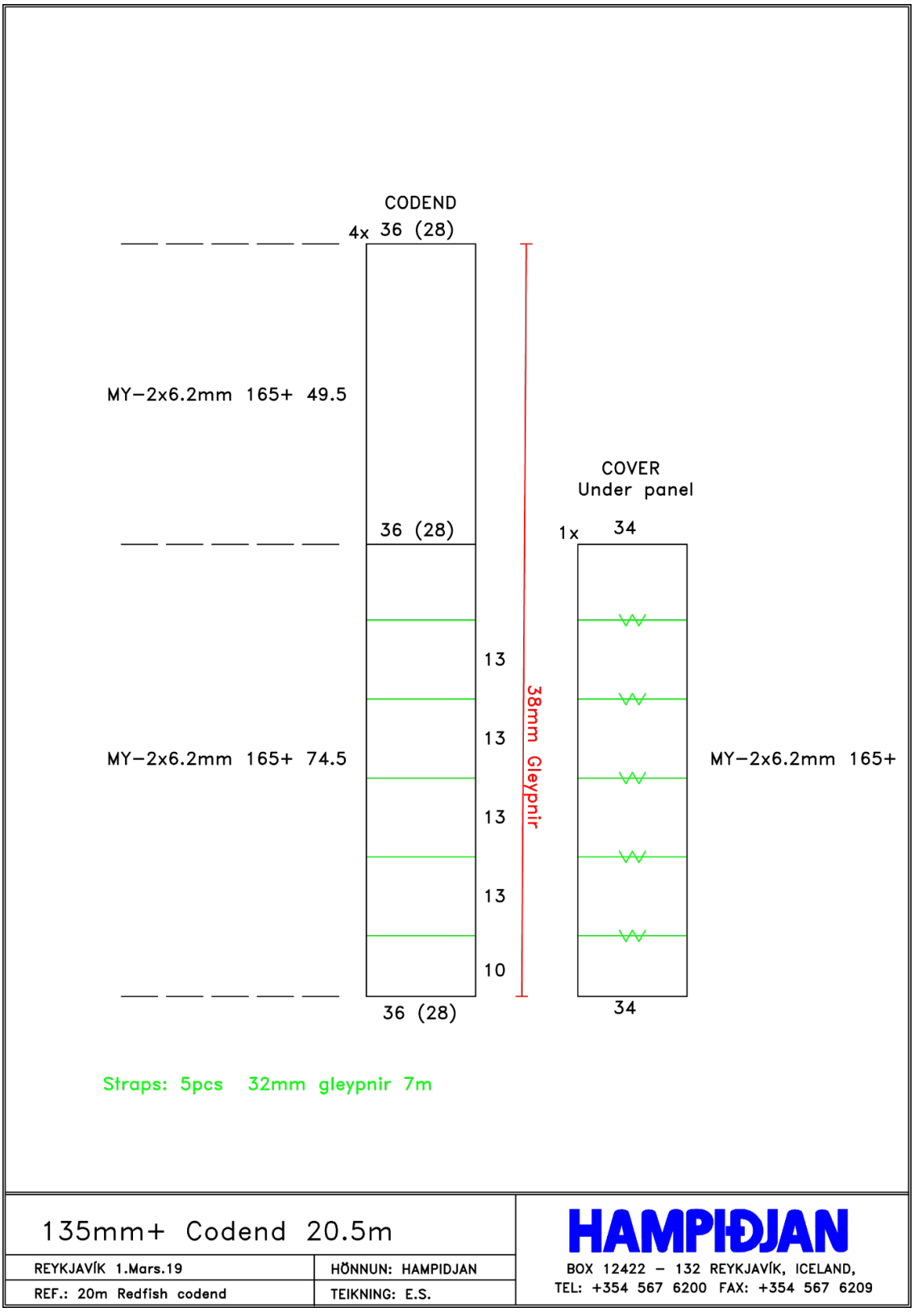
TEL:+354 530 3300 www.hampidjan.com
Gloria 2048 HO


Material: Mesh size: Length:
PA 7.2 mm 4000+ 12.0m
PA 5.1 mm 2000+ 4.0m
PA 4.4 mm 1000+ 2.0m
PA 3.7 mm 800+ 2.4m
PA 3.2 mm 400+ 2.4m
DYN 1.7 mm 200+ 10.0m
DYN 1.7 mm 200+ 10.0m
DYN 1.7 mm 200+ 10.0m
DYN 1.7 mm 200+ 10.0m
DYN 1.7 mm 200+ 10.0m
DYN 1.7 mm 200+ 10.0m
DYN 1.7 mm 160+ 16.0m
MN 3.1 mm 150+ 3.7m
MN 4.3 mm 155+ 3.8m
MNG 2X4mm 150+ 7.5m
MNG 2X6mm 157+ 7.5m
40 (610)
40
MN 1.8mm 200+
(Diaper)
PA 2.5mm 200+
T90
T90
T90
T90
32mm Gleypnir
45
45
Length:121.4m
REYKJAVIK 12.Feb.2018
REF.: GLORIA HO
DESIGN: HAMPIDJAN
DRAWING: E.S.
HAMPIÐJAN
SKARFAGÖRDUM 4 – 104 REYKJAVÍK, ICELAND,
TEL:+354 530 3300 FAX:+354 530 3309
Gloria HO Belly 300S



*) The Deep Vision camera system will be inserted between the trawl and the multisampler.


CODEND
4x 36 (28)
MY–2x6.2mm 165+ 49.5
36 (28)
13
13
13
13
10
MY–2x6.2mm 165+ 74.5
36 (28)
38mm Gleypnir
COVER
Under panel
1x 34
MY–2x6.2mm 165+
34
Straps: 5pcs 32mm gleypnir 7m
135mm+ Codend 20.5m
REYKJAVÍK 1.Mars.19
HÖNNUN: HAMPIDJAN
REF.: 20m Redfish codend
TEIKNING: E.S.
HAMPIÐJAN
BOX 12422 – 132 REYKJAVÍK, ICELAND,
TEL: +354 567 6200 FAX: +354 567 6209

Annex 7: Maturity scales

IMR standard scale:

Kode	Beskrivelse
Blank	**Ikke bestemt**.
1	**Umoden**. Gonadene er små. Ikke synlig egg/ melke.
2	**Modnende**. Gonadene større i volum. Synlig egg/ melke, men ikke rennende.
3	**Gytende**. Rennende gonader. Lett press på buken fører til at egg/melke kommer ut.
4	**Utgytt/hvilende**. Gonadene små, slappe og blodsprengte. Regenerering tar til, gonadene noe større og fyldigere enn stadium 1. Ikke synlig egg/melke.
5	**Usikker**. Brukes bare dersom det er usikkerhet mellom stadium 1 og 4.

Special scale for redfish:

Female:

Kode	Beskrivelse
blank	**Ikke bestemt**
1	**Umoden**. Lite gjennomskinleg eller gult ovarium (eggstokk) utan tydelege egg.
2	**Modnande**. Relativt fast ovarium med gyldne gule og opake egg.
3	**Laust ovarium** med lause gulaktige og gjennomskinlege egg (dvs. egga er befrukta).
4	Kan **med augene sjå embryo** (larvane) inne i egga.
5	**"Gytande"**. Eggmembranen har blitt broten og larvane frigjort.
6	**"Utgytt"**. Stort, laust, purpur, blodfarga ovarium eller fast, grått eller rosa.
7	**Usikker**

Male:

Kode	Beskrivelse
blank	**Ikke observert**
1	**Umoden**. Gjennomskinlege eller til dels kvite, tynne strengar.
2	**Modnande**. Store, oppsvulma, runde og kvite testiklar. Ved snitt i testiklane renn sperm (melke) ut.
3	Paring; testiklane tynnare. **Ved å trykke på kroppen renn sperm ut**.
4	Seksuelt inaktiv; ofte triangulære, brunlege testiklar. Sperm renn ikkje ut sjølv om ein snittar testiklane.
5	**Usikker**

Annex 8: Imaging manual

Camera setup

The camera stand does not come with a dedicated table, but can be set up on any available flat surface of an appropriate size. The blue plastic grid sheet is used as background and the metal bar is aligned on the left edge of the camera's view-field. The centre of the lamps (use the hinges as a reference) must be 42 cm above the grid pad. The camera is mounted with the lens 75 cm above the grid pad. The following camera settings are used:

- Manual focus (M)
- 200 ISO
- 1/30 exposure
- F20

The focus shall be set manually onto the grid and not be changed thereafter.

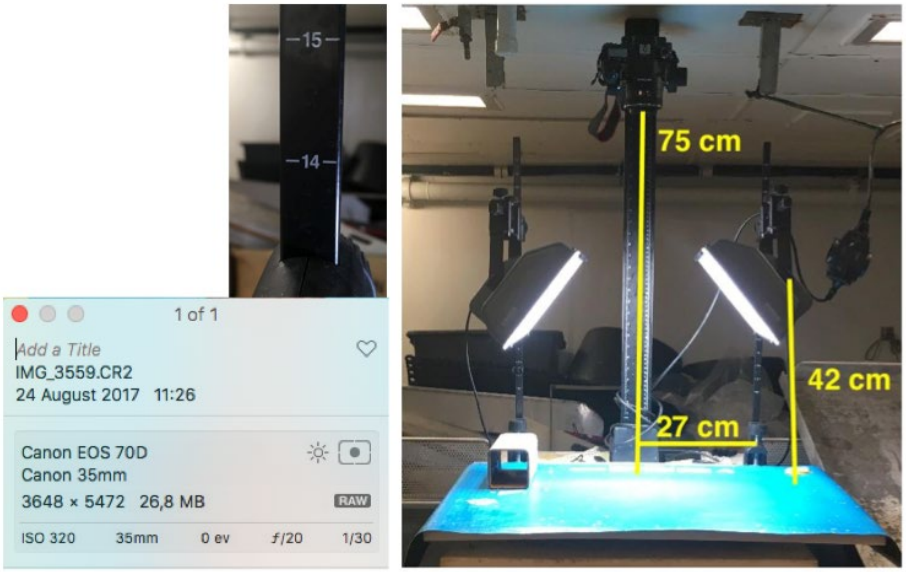


Figure 3: Setup of the camera stand. In practice, it shall be covered with plastic bags when not in use.

IPad

Turn on the camera power button before turning on the IPad. This eases finding the camera Wi-Fi, named **Dyphavskamera**. Shutting down after taking pictures is the reverse process, log out of the Wi-Fi, turn off the IPad and then the camera. It is important to log out **before** the camera is turned off.

Imaging process

Before **and** after each species an image of the empty grid with labels for cruise number, serial number and species name, but **NOT** fish number (or with fish no = 0) is taken. The redfish are photographed before the length measurements, being the first redfish to be measured for each redfish species. It must be ensured that all other measurements retain the same numbering. One option is to make numbered labels attached to each fish. Five fish of a maximum of four species (Snabel-, Vanlig- (Type B), Lus-, Peruer (Type A)) shall be photographed.

The fish is put on the blue grid background with the head upwards and to the left, then moved from the right towards the metal bar until it touches the barrier with the snout. The mouth shall be closed. The posture of the fish shall resemble that on the measuring board as close as possible. A small, yellow sheet of paper (post-it) shall be put in the lower left corner of the frame to enhance contrast for the MATLAB application that automatically rotates and processes the images.

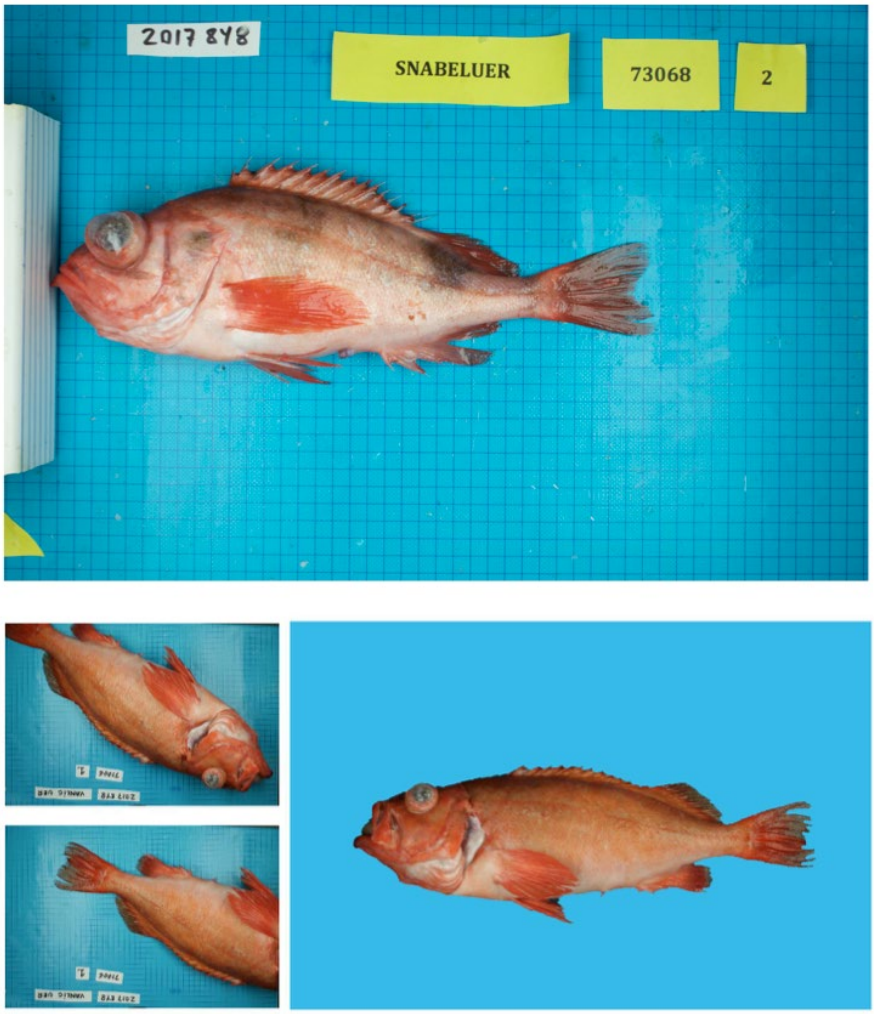


Figure 4: Representative setup of a fish for imaging (upper panel). Fish that are too large for the frame shall be photographed in two parts using the same deviance# (lower left panels) which can be combined with image software after the cruise (lower right panel).

Labelling

On each image the following piece of information should be located on different pieces of paper with easy to read handwriting (or printout):

- Survey number
- Serial number
- Species
- fish number

Cleaning

Clean the blue grid with paper between each fish so that reflections from wet parts are minimized.

Image file names

1. Use a computer with windows 8 or 10, older windows versions cannot show the canon CR2-format!
2. Create a folder for the serial numbers to be downloaded, e.g. SNR73002_73005
3. Running#_Surveyno_Species_Serialno_Individualno_Deviance#_Fileextension
   The Deviance# serves to identify the number of the photo of the **same** fish:

   - 1) first picture (in most cases the only one)
   - 2-8) further images of the **same** fish
   - 9) Any image that should be deleted

Species codes: REB = Snabeluer

REG = Vanlig Uer

SFV = Lusuer

PER = Peruer

Image example for *Sebastes mentella*: 3555_2017848_REB_73068_002_1.CR2

After changing the file names put the entire folder on a stick and copy to a common image folder (exact path varies depending on vessel): ~/IMAGES/Uerbilder/

Example from Egga-Sør 2018:

Z:/S2018104_PGOSARS_4174/CRUISE_DOCUMENTS/MULTIMEDIA_FILES/IMAGES/Uerbilder/

Annex 9: Agenda

International Council for the Exploration of the Sea
Conseil International pour l'Exploration de la Mer

ICES Working Group on International Deep Pelagic Ecosystem Surveys (WGIDEEPS) meeting

Virtual meeting (Teams), 09-11 February 2022 (Copenhagen time)

(Chairs: Matthias Bernreuther, Germany & Hannes Höffle, Norway)

Provisional Agenda

ToR (2019/FT/EOSG04):
f. Coordinate the international deep pelagic ecosystem survey with special emphasis on redfish to be carried out in the Norwegian Sea and adjacent waters in August 2022

Wednesday, 09 February 2022

10:00 Start of the meeting
- Welcome, house rules, Introductions
- Adoption of the agenda

10:30-12:30
- Review of recommendations from the last survey reports (WGIDEEPS reports ICES CM 2016/SSGIEOM: 02 and ICES CM 2019/EOSG: 01) and other expert groups

12:30-13:30 Lunch break

13:30-17:00 Planning of the survey in the Norwegian Sea in 2022 - overview
- *Vessel, timing and survey area*
- *Hydro-acoustics*
- *Trawling*
- *Biological sampling*
- *Hydrography*
- *Deep Vision camera system*
- *Additional measurements and sampling*

Thursday, 10 February 2022

09:30-12:30
- Review and discussion on the revision of SISP 11 – IDEEPS VI (Irminger Sea survey)
- Integration of the survey in the Norwegian Sea with SISP 11 - IDEEPS VI)
- Discussion on the use of the camera system vs. the multisampler (Shale Rosen)

12:30-13:30 Lunch break

13:30-17:00 Continue planning of the survey in the Norwegian Sea 2022

Friday, 11 February 2022

09:30-12:30 Other issues

- IDEEPS data to DATRAS
    - Status of data submission.
- Age reading – status of systematic age reading
- Finalisation of working group recommendations
- Future of the surveys (including participation of other countries in the Norwegian Sea)
- Adaptation and further development of the survey
- Any other business

12:30-13:30 Lunch break

13:30 Discuss draft report, clarify outstanding issues

☞ Deadline for report: **1 March 2022**

15:00 End of the meeting