DCF
NEPHROPS
SAMPLING PROGRAMME

revised APRIL 2016 JD
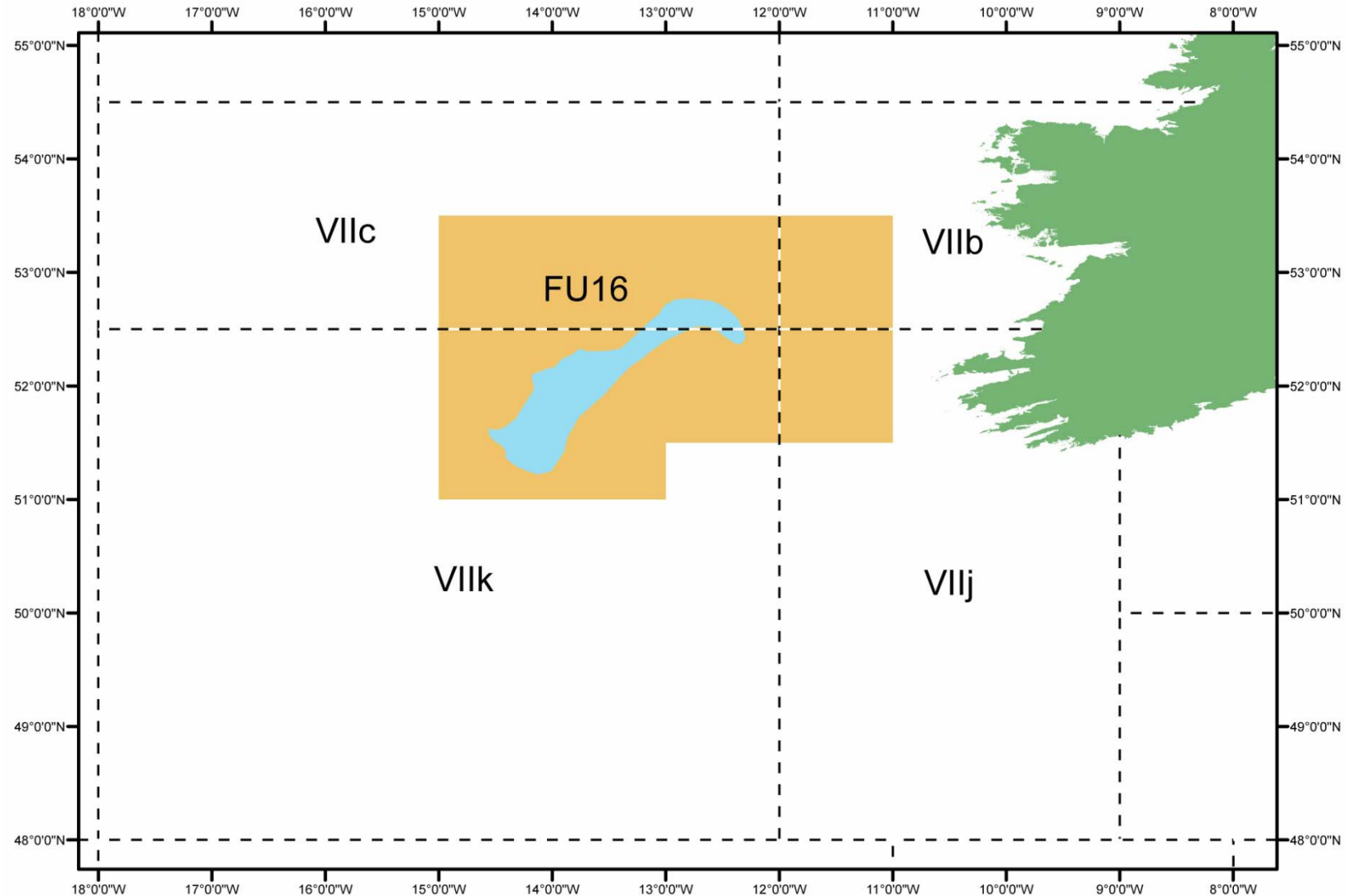
Nephrops :Functional Units, UWTV, VMS.
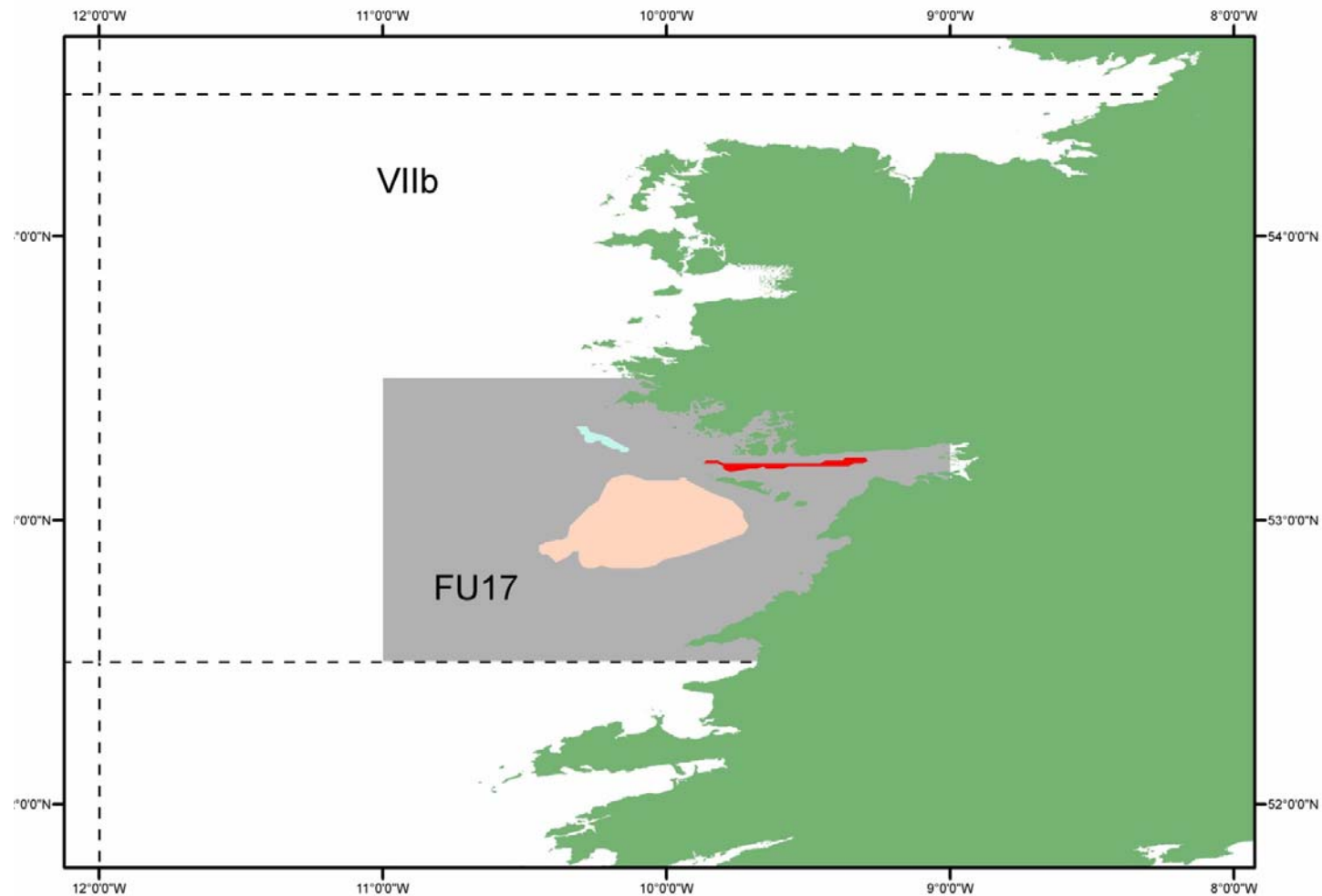

Mean Density (burrow/m²)

- 0- 0.15
- 0.16 - 0.31
- 0.32 - 0.47
- 0.48 - 0.62
- 0.63 - 0.78
- 0.79 - 0.94
- 0.95 - 1.09
- 1.10 - 1.25
- 1.26 - 1.41
- 1.42 - 1.56

Survey Partners in the Irish Sea:
Northern Ireland (AFBI), Ireland (MI) and England (CEFAS).
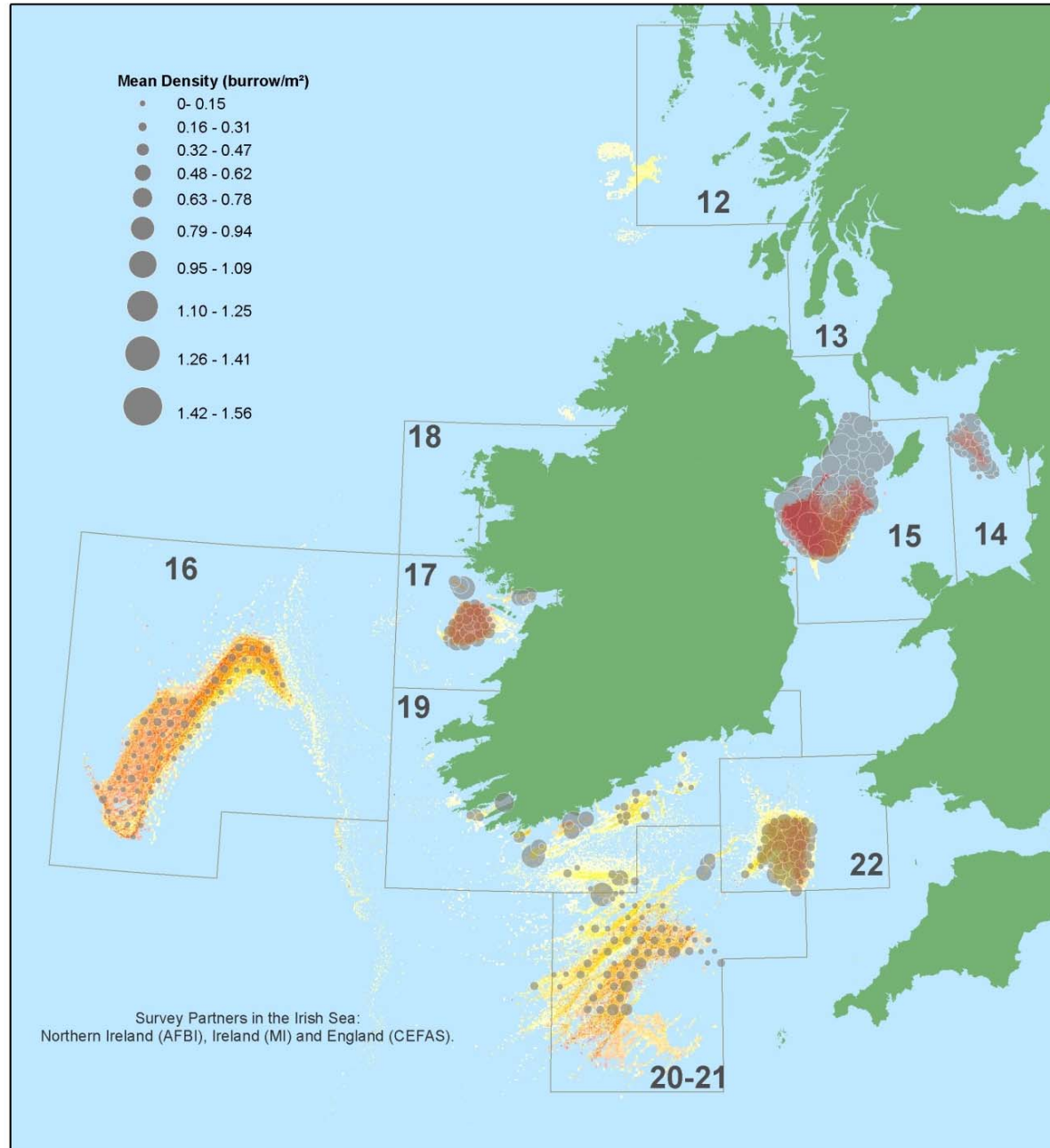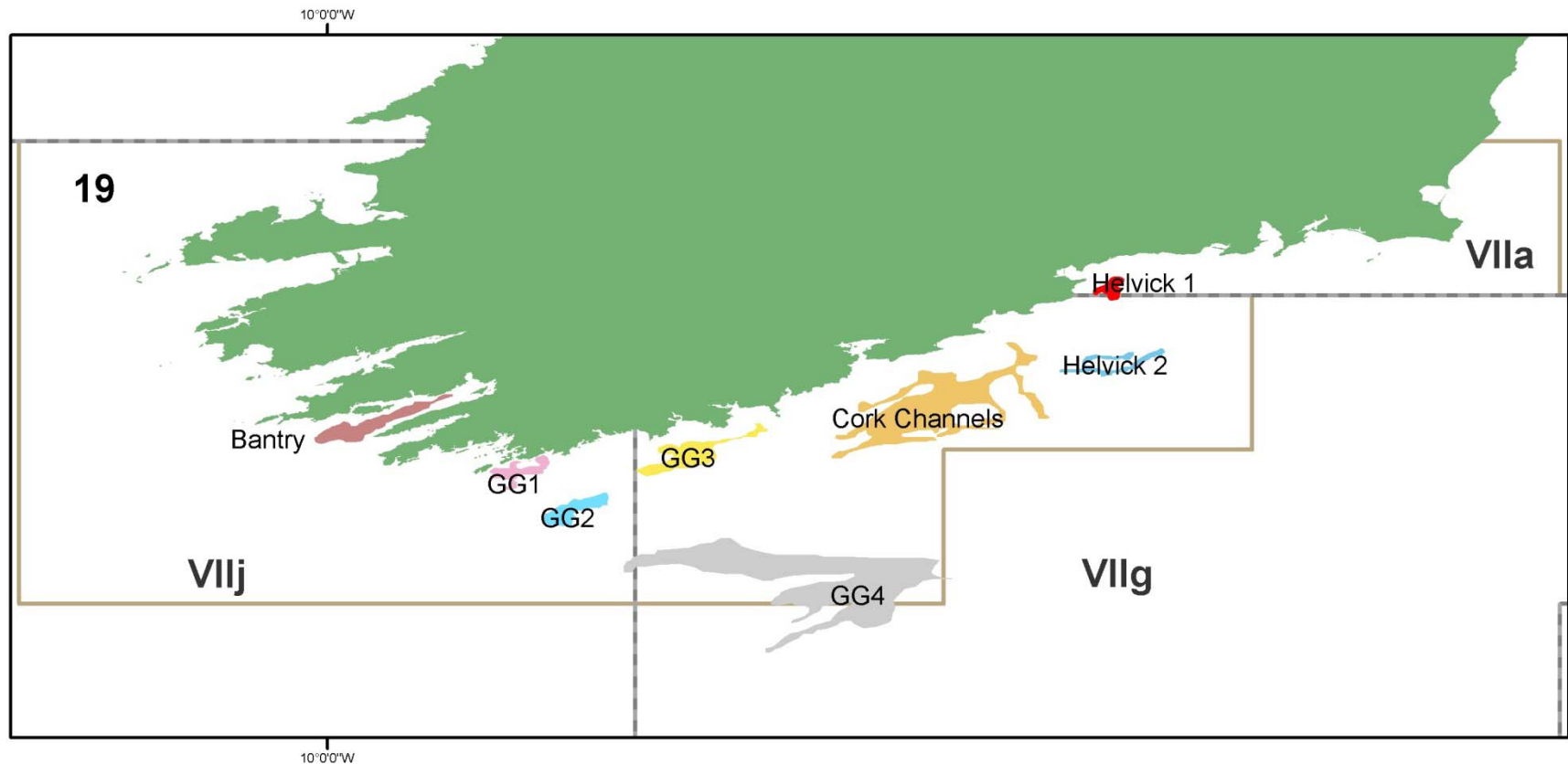
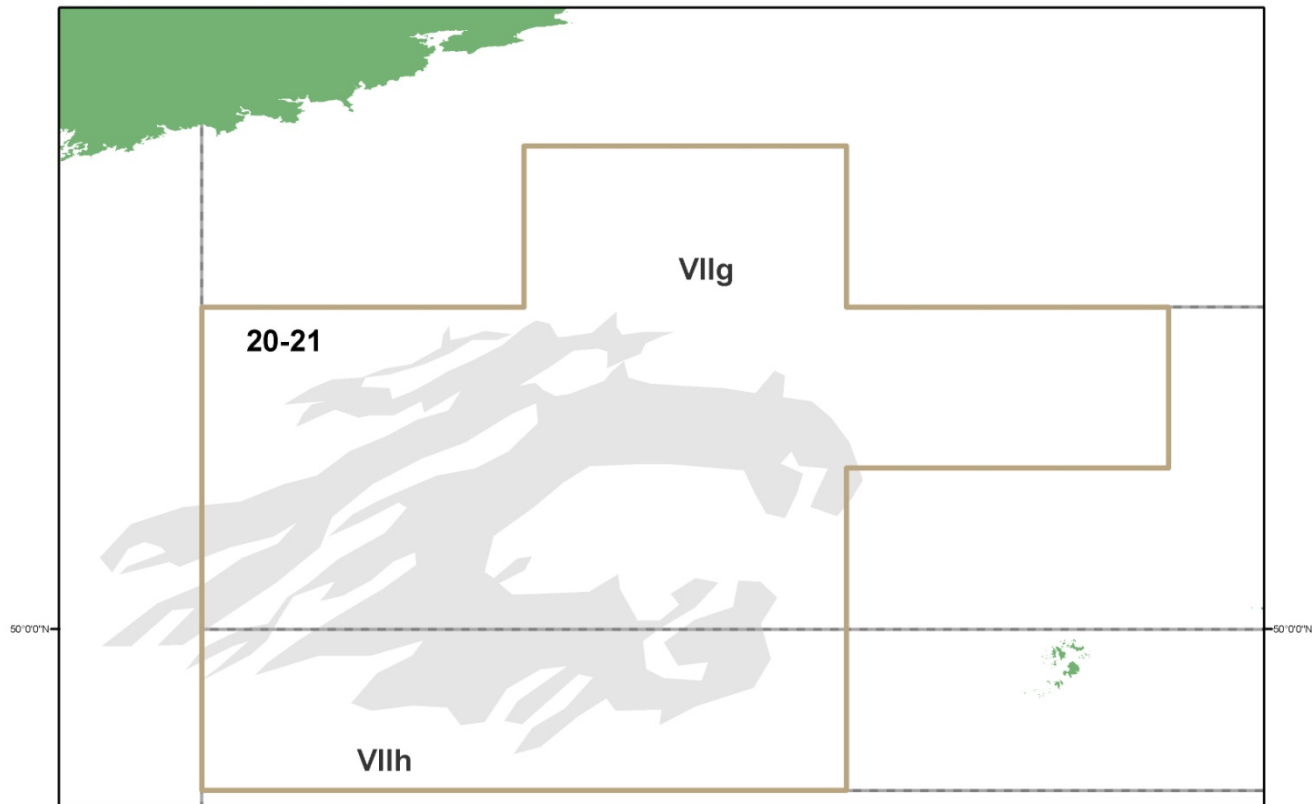# FU16 – ICES area VIIbcjk
Nephrops ground Porcupine Bank.

FU17 – ICES area VIIb,
Nephrops ground Aran (main ground to be sampled)
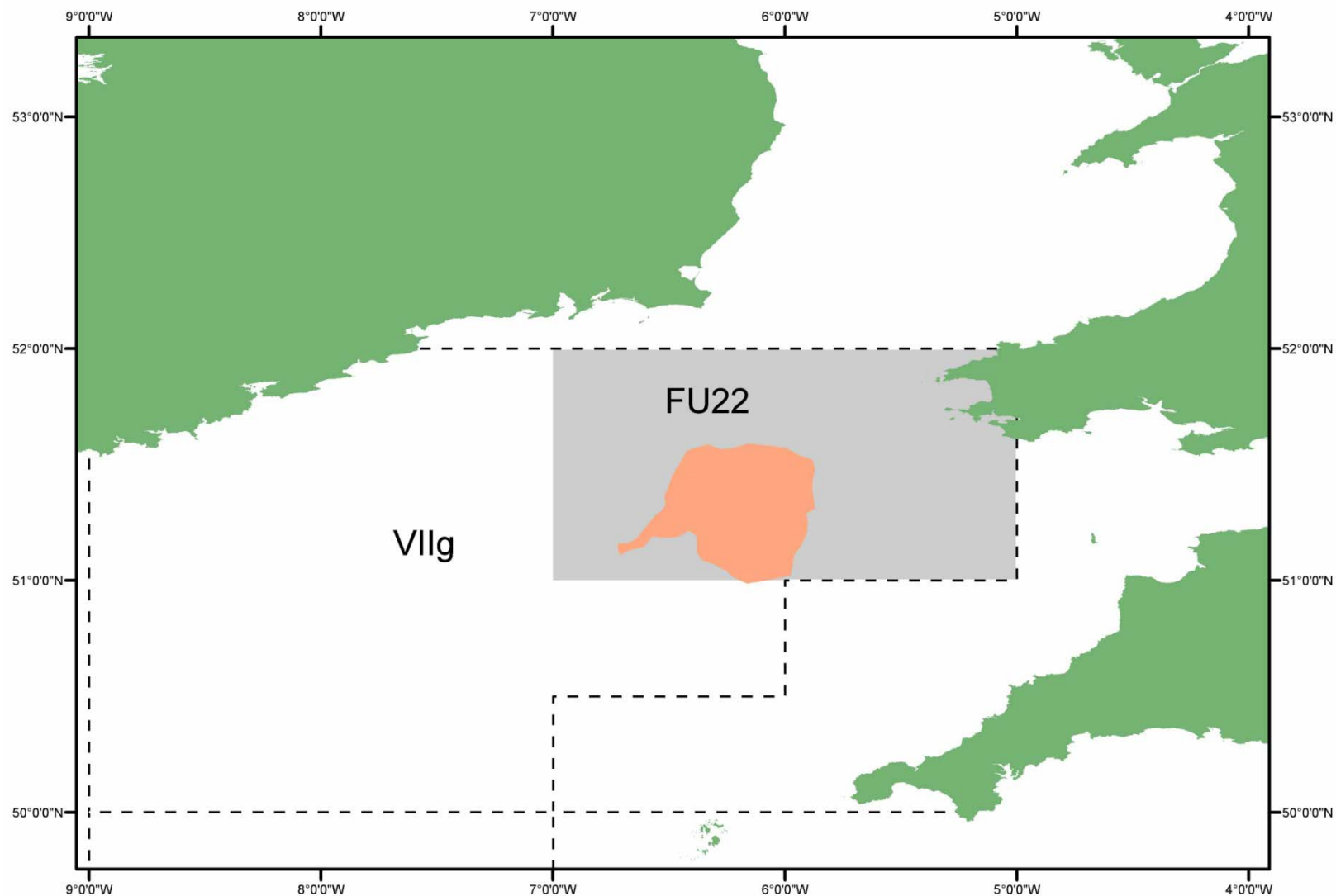# also Galway Bay and Slyne Head.

FU19 – ICES area VIIagj,
Nephrops grounds: Bantry, Galley 1-4, Cork Channels, Helvick 1-2.

FU2021 – ICES area VIIg&h, *Nephrops* Grounds: Labadie, Jones and Cockburn.

FU22 – ICES area VIIg,
Nephrops ground Smalls.

Functional Units and associated *Nephrops* grounds.

- **FU14** :eastern Irish Sea
- **FU15**: western Irish Sea
- **FU16**: Porcupine Bank
- **FU17**:Aran Grounds, Galway Bay and Slyne Head
- **FU19**:Galley Grounds1-4, Bantry Bay, Kenmare Bay, Dunmanus Bay, Helvick, South Cork Channels.
- **FU20-21**:Labadie banks, Jones and Cockburn
- **FU22**:Smalls

Measuring a Nephrops

• From back of eye socket to end of carapace
• If *Nephrops* is soft-shelled place callipers carefully for correct measurement.

Male
1st pleopods

Female
1st pleopods
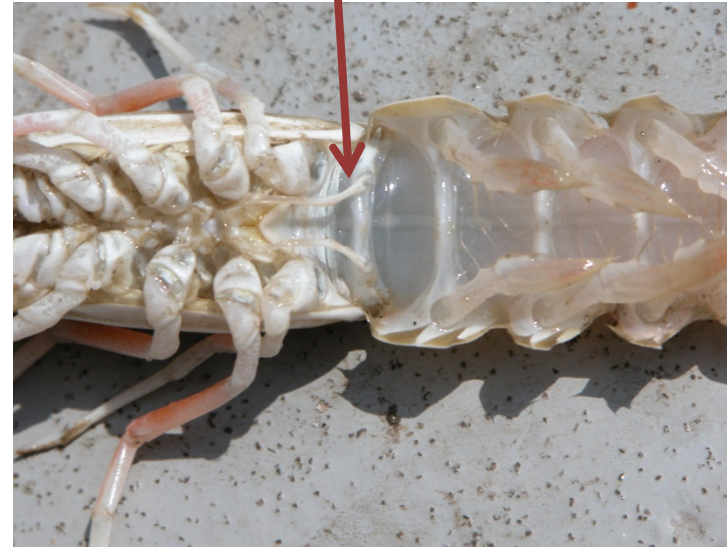
Female Ovary Maturity Stages

- Female Pale - ovary not visible through carapace
- Female Medium - slight green tinge of ovary just visible through carapace
- Female Dark - distinct green and v - shape of ovary easily visible through carapace
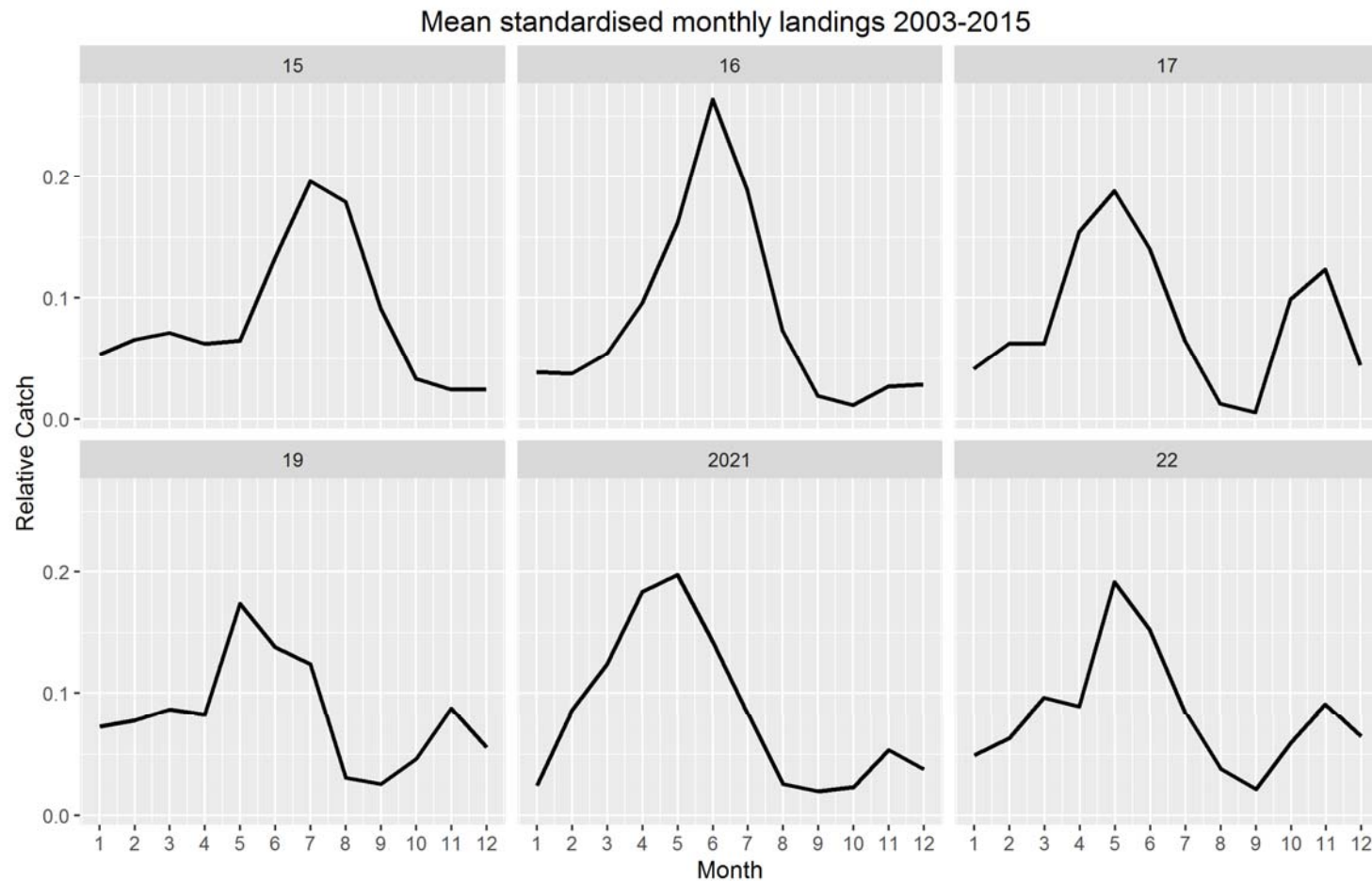- Female Eggs - eggs present on abdomen

DCR Targets: Basis

Recent 3 year landings average by FU
1 sample per 50 t landed.
1 sample from a vessel = 1 box of bulk catch and 1 box discard sample
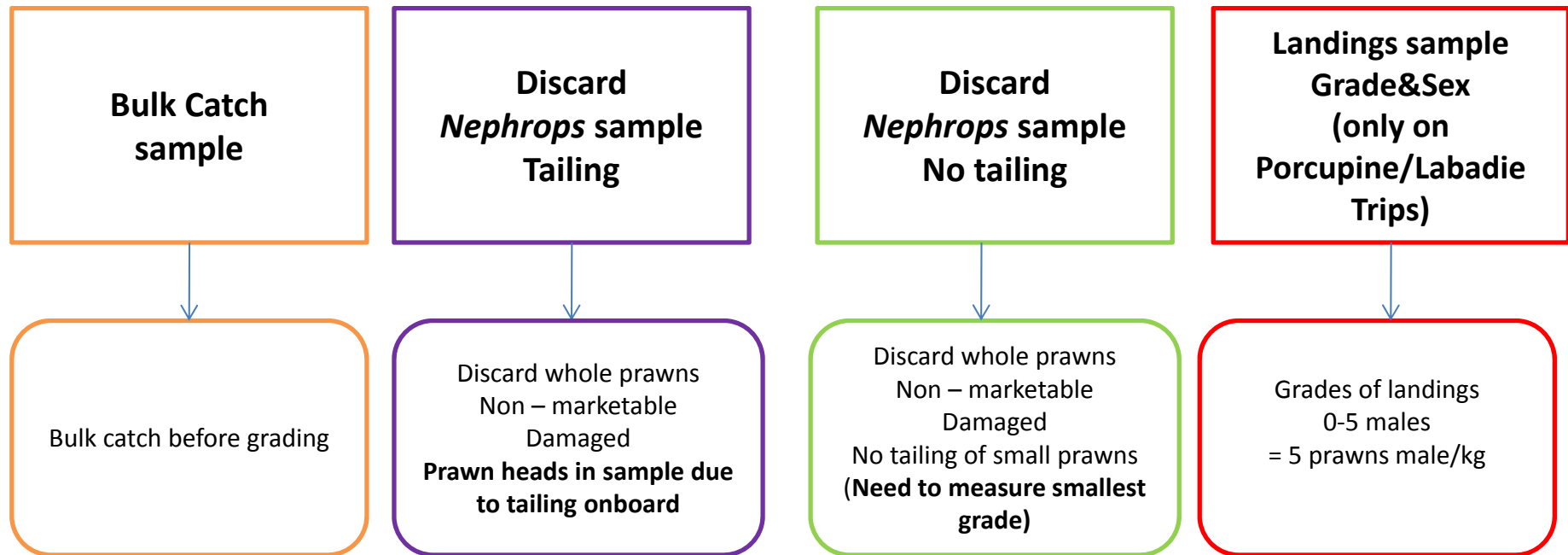Sample levels reflect the seasonality of the fishery

Mean standardised monthly landings 2003-2015

Current Year Sampling Log:
located at: [Sampling Levels](#)

- Table below shows 2016 Sampling levels highlighted where 4 samples or more required by month
- 1 sample from a vessel = 2 = 1 catch and 1 discard
- Please remember the targets are based on historical landings and factors such as weather in the current year may affect landings and sampling targets are therefore only intended as a guideline.
- Targets are a minimum

FU	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Change
15	3	3	3	3	4	4	8	11	6	4	2	2	53	Down
16	1	1	1	2	2	4	4	1	1	1	1	1	20	na
17	1	2	2	3	5	3	2	1	1	1	3	1	25	Up
19	1	1	1	1	2	2	2	1	1	1	1	1	15	Down
22	3	2	3	4	7	9	7	3	2	2	4	3	49	Up
2021	1	2	4	7	6	3	1	1	1	1	3	2	32	Up

Nephrops Sample types:

Bulk Catch sample

Discard *Nephrops* sample Tailing

Discard *Nephrops* sample No tailing

Landings sample Grade&Sex (only on Porcupine/Labadie Trips)

Bulk catch before grading

Discard whole prawns
Non – marketable
Damaged
Prawn heads in sample due to tailing onboard

Discard whole prawns
Non – marketable
Damaged
No tailing of small prawns
(Need to measure smallest grade)

Grades of landings
0-5 males
= 5 prawns male/kg

Nephrops Sample types & NEMESYS:

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                          COMMERCIAL
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Bulk Catch sample

Discard Nephrops sample Tailing

Discard Nephrops sample No Tailing

Landings sample Grade&Sex (only on Porcupine/Labadie Trips)

Bulk catch before grading

Discard whole prawns
Non – marketable
Damaged
Prawn heads in sample due to tailing onboard

Discard whole prawns
Non – marketable
Damaged
No tailing of small prawns

Grades of landings
0-5 males
= 5 prawns male/kg

DISCARD TRIP

Porcupine Observer Trip

Sample Types in NEMESYS

Nemesys Sampling Events

- **Choose Commercial Sample type:**
  when it is a routine vessel sample (catch and/or discards) that you have organised collection of from vessel.

- **Choose Discard Trip:** when it is a sample brought in by an observer so you will have FAT/Trip/Code. Enter haul as 0.

- **Choose Discard Trip:** when observer is on Porcupine Observer trip.
  Allows haul info for bulk catch & discard sampling.

- **Survey sample:** On survey (GFS, UWTV) only and will only allow you to weigh and measure catch.

- **Graded landings sample:** Allows graded sampling where enter grade weight first – put in 0 as weight.
  Details of this sampling in FU16 SOP.

- Go through these options and familiarise please.
- **<u>Any test data must be deleted otherwise it gets uploaded and could be used in analysis.</u>**

Database Backups:

- End of each quarter copy database to :
- FISHDATA\TECHNICIANS MASTER FOLDER\NEMESYS Backups\2016\
- Naming Convention: For example: RF_26-Jan-2012
- This is so we can chase down any data anomalies.
- If you do not make a back up of database or upload regularly you will be at risk of losing the data.

- Upload after each sample worked up
- Back up every quarter.

Organising A Bulk Catch Sample

- Random & Representative of Bulk Catch Profile.
- From any haul that is not foul (gear damage).
- Crew picks up "on the run".
- Sample will contain market & non-market size *Nephrops.*
- Sample will contain fish and non-fish discards.
- Sample not to be mixed with the Discard sample.
- Should be no "heads" in the box.
- Store with waterproof label/tagged on outside
- If sample from observer trip: Trip code also on label: FAT/XX/XX/XX

Bulk Catch Sample

Sorting the Bulk Catch Sample = Target Number "n" ~ 250

- Sort box as there will be settling of animals.
- Pick out all the fish and non fish so left with *Nephrops* only.
- This will have juvenile undersized *Nephrops* also as it has not been sorted and is the bulk catch that came on deck before being sorted in the hopper.
- If there are no juvenile/undersized prawns in the sample this will alert you that the sample is biased. If you think sample is biased then sample will be disregarded completely but check first before doing so.
- Randomly Grade 1 kg of Sample (Count number of *Nephrops*)
- If 1 kg = 50 prawns, then need to measure 5kgs = 250 animals
- Segregate this sub-sample into male, female pale, female dark and female medium as described in the protocol.
- Weigh each segregated component and enter these working weights into NEMESYS.
- In NEMESYS measure each individual.

Bulk Catch Sample bell shaped graph
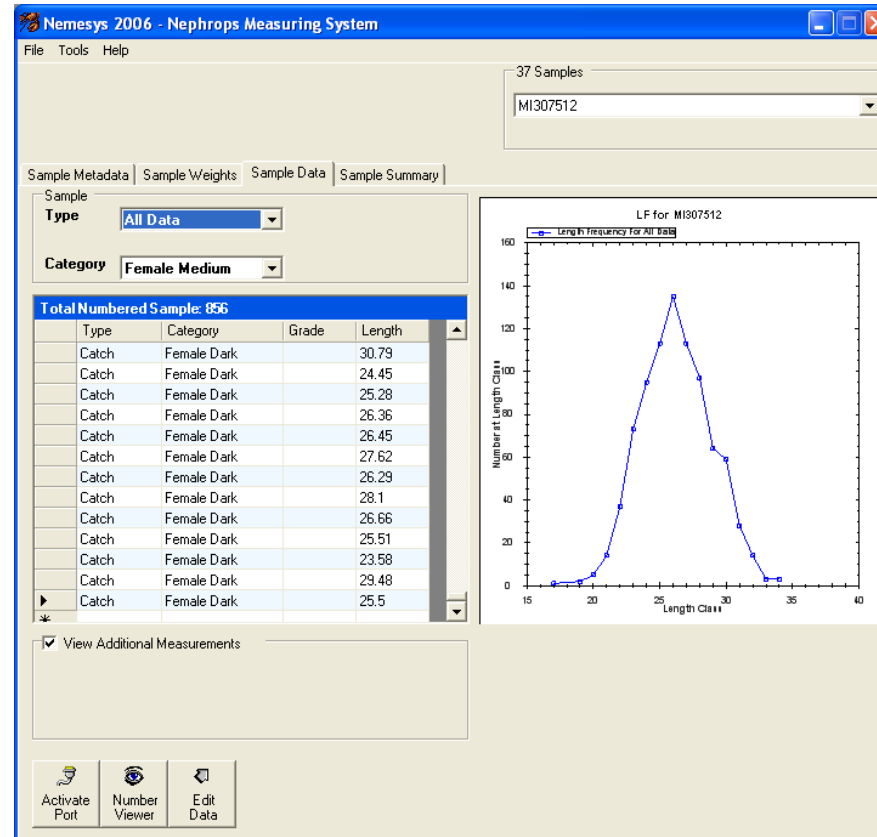
Bulk Catch will have small undersize prawns as shown in NEMESYS graph.
If after sampling you notice that the length frequency is chopped and that prawns of the MLS and over are only present-you know that sample is biased/graded.

Organising A Discard Sample

- Random & Representative of Discard Profile.
- From any haul that is not foul (gear damage).
- Crew picks up "on the run".
- Sample will contain non-market size.
- Sample will contain "heads" when vessel tailing.
- Sample will contain fish and non-fish discards.
- Store with waterproof label/tagged on outside
- If sample from observer trip: Trip code also on label: FAT/XX/XX/XX

Sorting the Discard Sample = Target Number "n" ~ 250
Heads 250
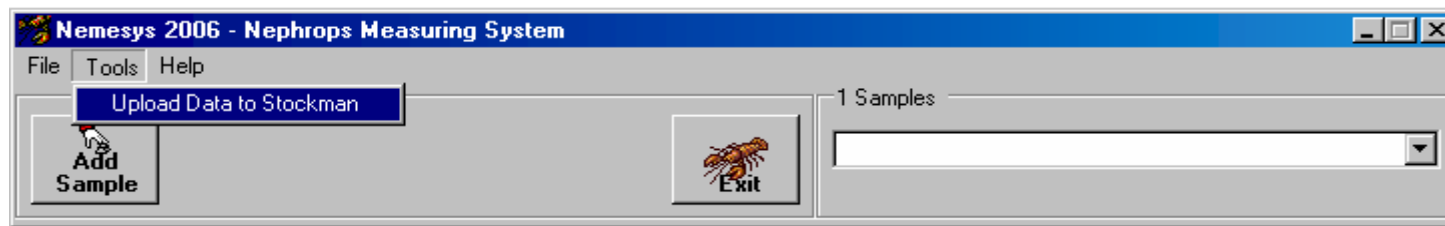**Small whole discarded Nephrops 250 or what is available**

- Sort the whole box into the fish component, heads of prawns and whole juvenile prawns.

- The fish component may be used as a DCF discard sample, so fish will have to be worked up for that.
- If not used for this type of sample put aside and work on *Nephrops* only.

- Randomly collect approximately 250 heads. Weigh and measure.

- Randomly collect approximately 250 whole juvenile prawns. Segregate into male, female pale, female dark and female medium as described in the protocol.

- Weigh each component and measure each individual.

- The total weight for all heads and whole prawns is not needed for the discard component.
- Total weights for each segregated component measured are needed e.g. male, heads, females.

- Only weights of Nephrops to be measured are entered in Nemesys, ie, the working weights.

Discard Sample-Graph
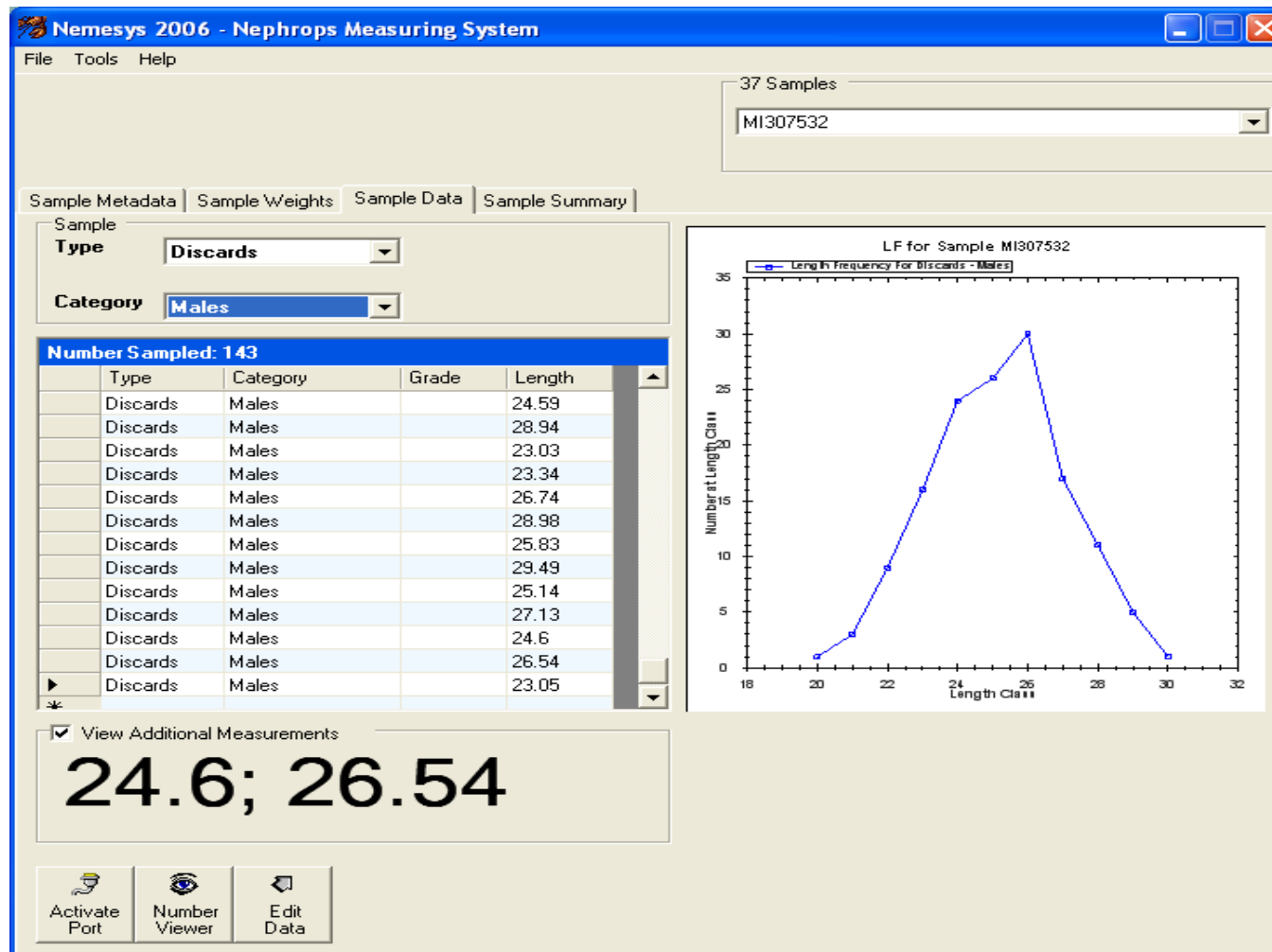
Uploading Data to the Stockman Database Server
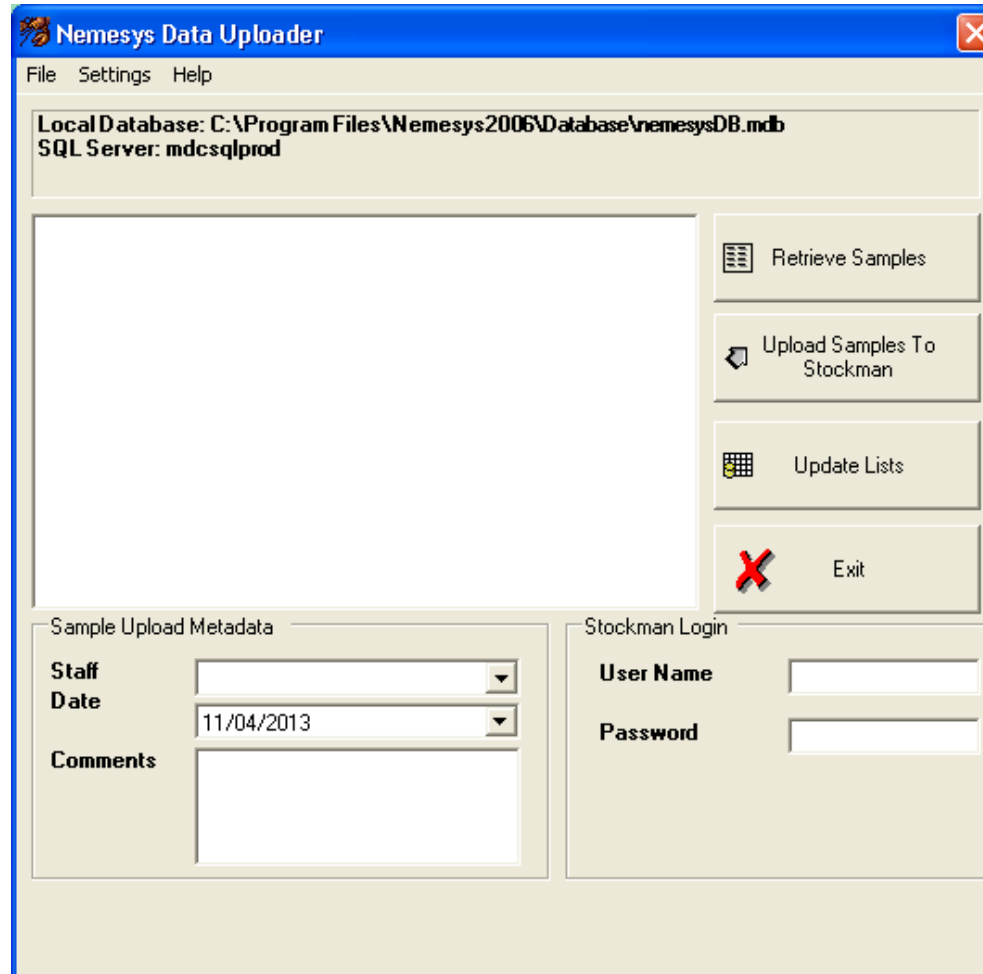
From the Tools Menu select the "Upload Data to Stockman" sub-menu.

You are presented with the Nemesys Data Uploader dialog.

The local database and the SQL Server are now displayed at the top of the Nemesys Data Uploader dialog.
You are now ready to start uploading data to Stockman.

Click the Retrieve Samples button and you are provided with a list of the available samples.

- Select the samples you want to upload by toggling them on as illustrated in the above dialog.
- Supply a name for the person who is uploading the data and the appropriate date.
- Supply a username and password for the Stockman SQL Server (extraction/extraction)
- Click the "Upload Samples to Stockman" button to proceed with the data upload.
- Once the data has been uploaded to Stockman you will not be able to edit it.
- The progress of the upload is displayed in the status bar at the bottom of the dialog.
- If the program falls over or error message pops up during this process
  please email Chris Allsop so that it can be fixed.

Fleet and Movement

- Fleet is mobile and will move around the Grounds.
- If you know that a good contact has moved off your area to another FU tell your colleague.
- www.marinetraffic.com/ais.
- Spread the samples across as many boats as possible.
- Update and maintain your Fleet Contact list as this invaluable to staff who may need to cover your area.
- Alert your manager and me when your are away for peak times.
- Ensure that Nephrops sampling equipment is working and available to staff who may need to cover your area.
- No gaps in sampling please.

Why do we sample?

A sampling programme which provides a relatively precise and accurate length distribution of landings and discards is crucial.

This is used to calculate the average weight of an individual *Nephrops* and the proportion of the catch discarded in numbers.

These two parameters are multiplied by the UWTV survey estimate to determine the catch options provided by ICES.

In addition the time series of length distributions are closely monitored for any changes in mean lengths, sex ratio, discard rates etc. These data are updated annually and presented to the ICES Celtic Seas Ecoregion Working group.

Data to WGCSE : sampling levels

FU15 western Irish Sea Irish Sampling Levels					
		Number of samples		Numbers Measured	
Year	Quarter	Catch	Discards	Catch	Discards
2012	1	8	8	4,742	3,886
2012	2	10	9	8,779	5,393
2012	3	12	12	8,488	4,796
2012	4	2	2	1,021	840
2013	1	5	5	2,353	1,761
2013	2	15	14	6,914	3,709
2013	3	15	13	7,552	4,756
2013	4	7	7	3,125	3,422
2014	1	10	11	3,148	2,991
2014	2	14	14	6,615	3,547
2014	3	13	13	5,628	4,697
2014	4	5	5	1,962	1,131
2015	1	5	5	2,026	2,475
2015	2	9	9	3,943	2,219
2015	3	7	3	2,850	1,536
2015	4	7	7	2,452	2,160

Data to WGCSE : Mean weight in catch samples each point is a sample
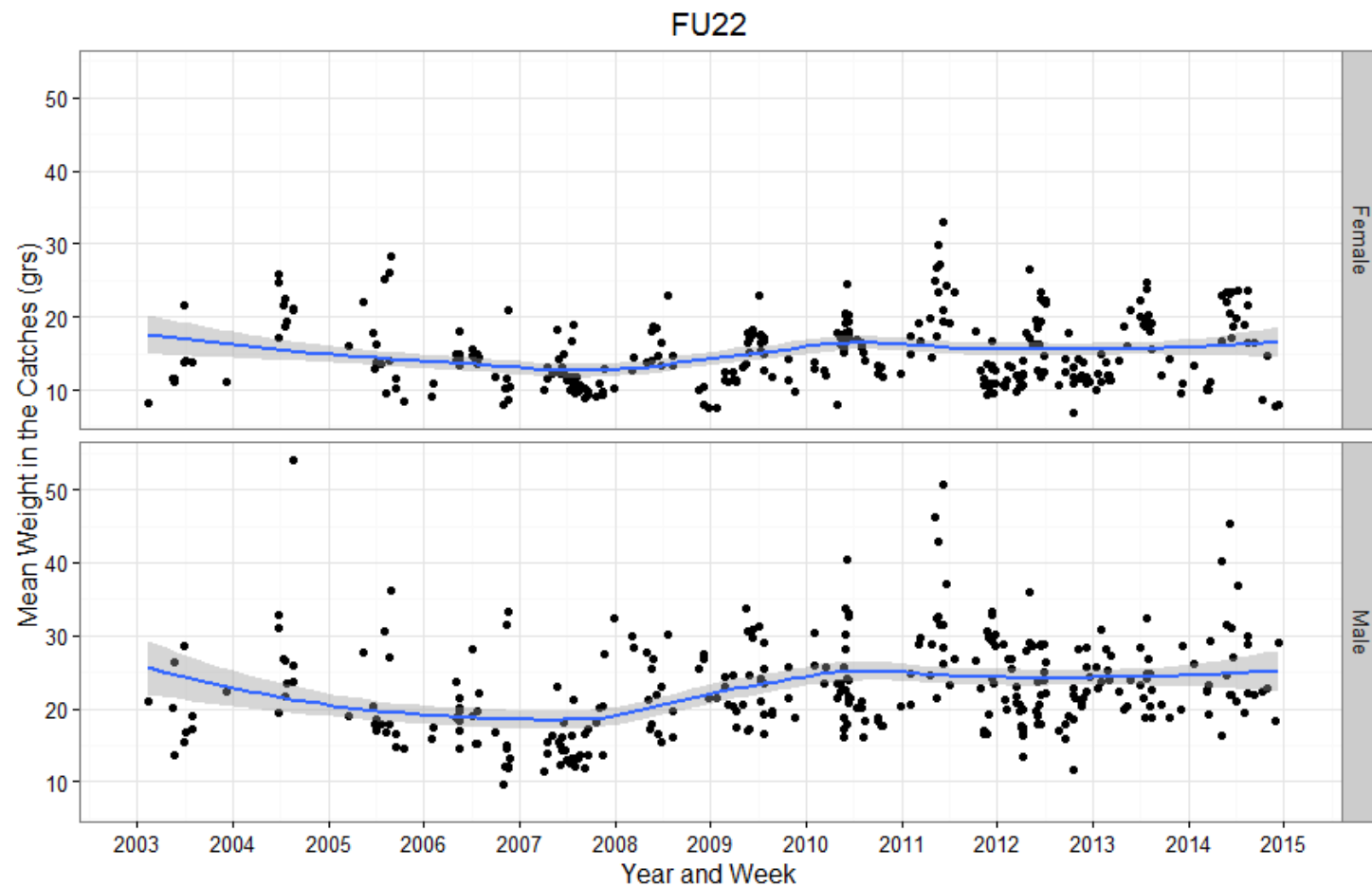
Data to WGCSE:mean size trend

FU 19						
Year	Catches		Landings			
			<35mm CL		>35mm CL	
	Female	Male	Female	Male	Female	Male
2008	33.0	36.1	32.1	32.8	38.2	39.0
2009	29.4	33.9	30.7	30.6	37.3	39.3
2010	29.4	32.6	31.2	31.5	37.3	39.5
2011	29.0	30.5	30.9	31.0	37.1	39.1
2012	28.3	31.2	30.2	31.3	38.0	38.5
2013	28.6	30.8	30.5	31.1	38.0	39.4
2014	29.8	33.1	31.2	31.9	37.2	38.8
2015	28.8	33.0	30.5	31.6	37.5	38.9

Data to WGCSE : discard levels

FU	15					
			Discard Weight (t)			
Year	Q1	Q2	Q3	Q4	Total (t)	% Weight
2003	307.50	366.45	302.65	43.78	1,020.38	27%
2004	168.10	251.16	271.97	75.45	766.68	22%
2005	165.30	83.93	184.97	22.84	457.04	18%
2006	157.70	69.54	345.49	70.50	643.23	24%
2007	162.71	164.22	795.85	65.95	1,188.73	30%
2008	58.70	99.46	412.51	37.72	608.40	16%
2009	59.68	108.96	389.85	217.56	776.05	25%
2010	89.54	94.95	346.80	151.07	682.36	21%
2011	161.57	401.40	630.69	113.89	1,307.56	27%
2012	152.58	356.50	501.95	27.04	1,038.06	21%
2013	99.85	109.70	329.18	82.83	621.56	20%
2014	105.95	67.98	546.75	79.53	800.21	21%
		Female Numbers '000s		Male Numbers '000s		Both sexes
Year	Landings	Discards	Landings	Discards	% Discard	
2003	48,205	51,858	106,149	59,193	42%	
2004	61,284	46,013	97,463	37,367	34%	
2005	42,754	27,221	68,619	23,385	31%	
2006	60,721	40,870	64,818	29,344	36%	
2007	82,275	83,926	84,112	38,282	42%	
2008	47,821	21,828	113,695	22,259	21%	
2009	46,266	45,997	74,861	36,642	41%	
2010	65,715	40,881	85,905	34,106	33%	
2011	121,675	91,139	122,913	63,498	39%	
2012	133,817	76,355	136,478	54,953	33%	
2013	75,919	43,764	109,188	37,544	31%	
2014	58,209	52,459	134,546	43,491	33%	

Grade data

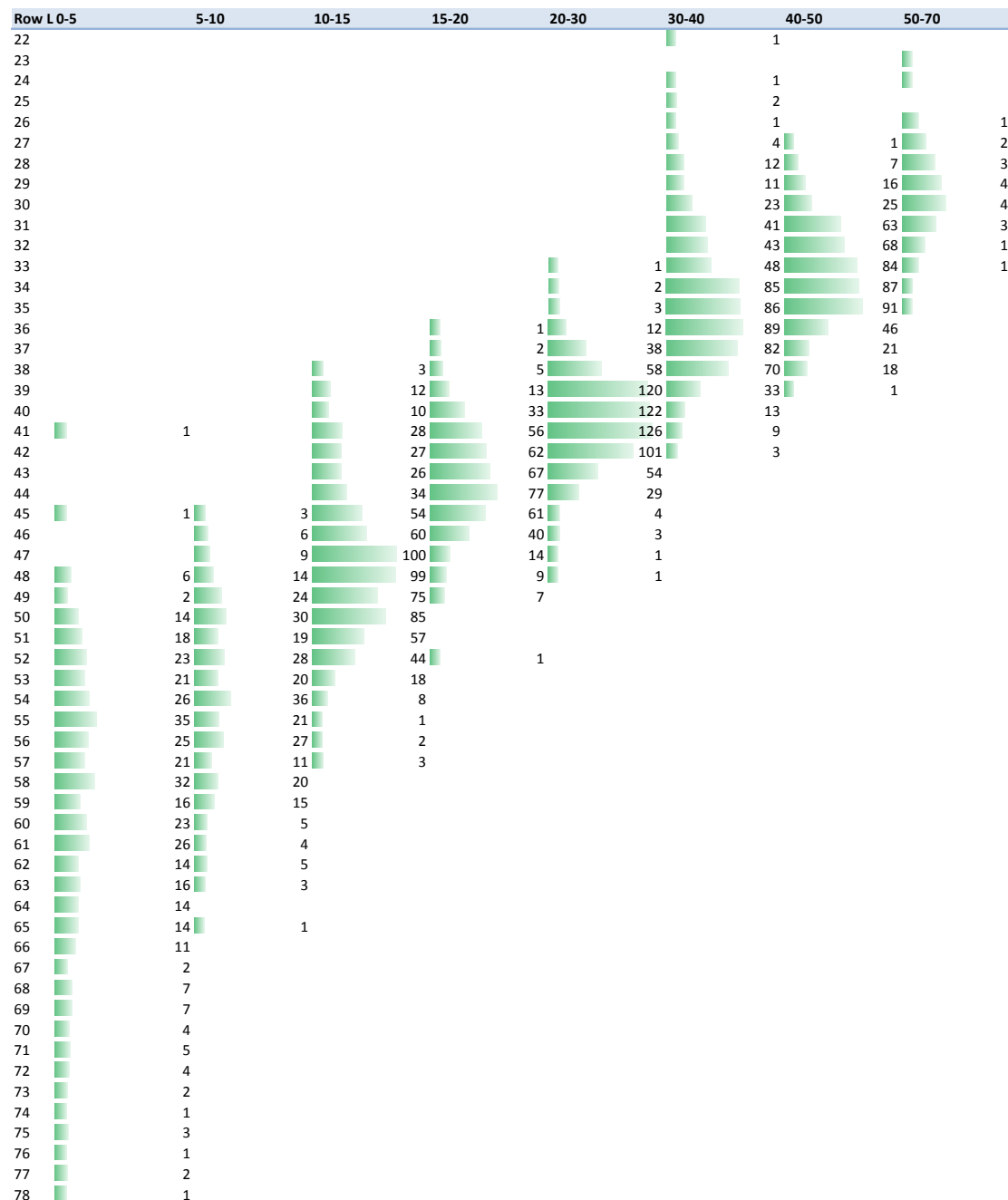## Information from Industry

In 2013 the Irish industry provided grade data for approximately 57% of the Irish landings.

Year	% of Irish landings
2011	45%
2012	60%
2013	57%

4 vessels were sampled for grades in 2013. Structure consistent with previous years.

Row L	0-5	5-10	10-15	15-20	20-30	30-40	40-50	50-70
22							1	
23								1
24							1	1
25							2	
26							1	10
27						4	1	20
28						12	7	32
29						11	16	40
30						23	25	46
31						41	63	33
32						43	68	18
33					1	48	84	10
34					2	85	87	2
35					3	86	91	1
36					1	12	89	46
37					2	38	82	21
38				3	5	58	70	18
39				12	13	120	33	1
40				10	33	122	13	
41		1		28	56	126	9	
42				27	62	101	3	
43				26	67	54		
44				34	77	29		
45		1	3	54	61	4		
46			6	60	40	3		
47			9	100	14	1		
48		6	14	99	9	1		
49		2	24	75	7			
50		14	30	85				
51		18	19	57				
52		23	28	44	1			
53		21	20	18				
54		26	36	8				
55		35	21	1				
56		25	27	2				
57		21	11	3				
58		32	20					
59		16	15					
60		23	5					
61		26	4					
62		14	5					
63		16	3					
64		14						
65		14	1					
66		11						
67		2						
68		7						
69		7						
70		4						
71		5						
72		4						
73		2						
74		1						
75		3						
76		1						
77		2						
78		1						

Data to WGCSE :Length Frequency Distribution

Length frequencies for catch (dotted) and landed(solid): Nephrops in FU22

Mean length of landings and catch vertically MLS (25mm) and 33mm levels displayed
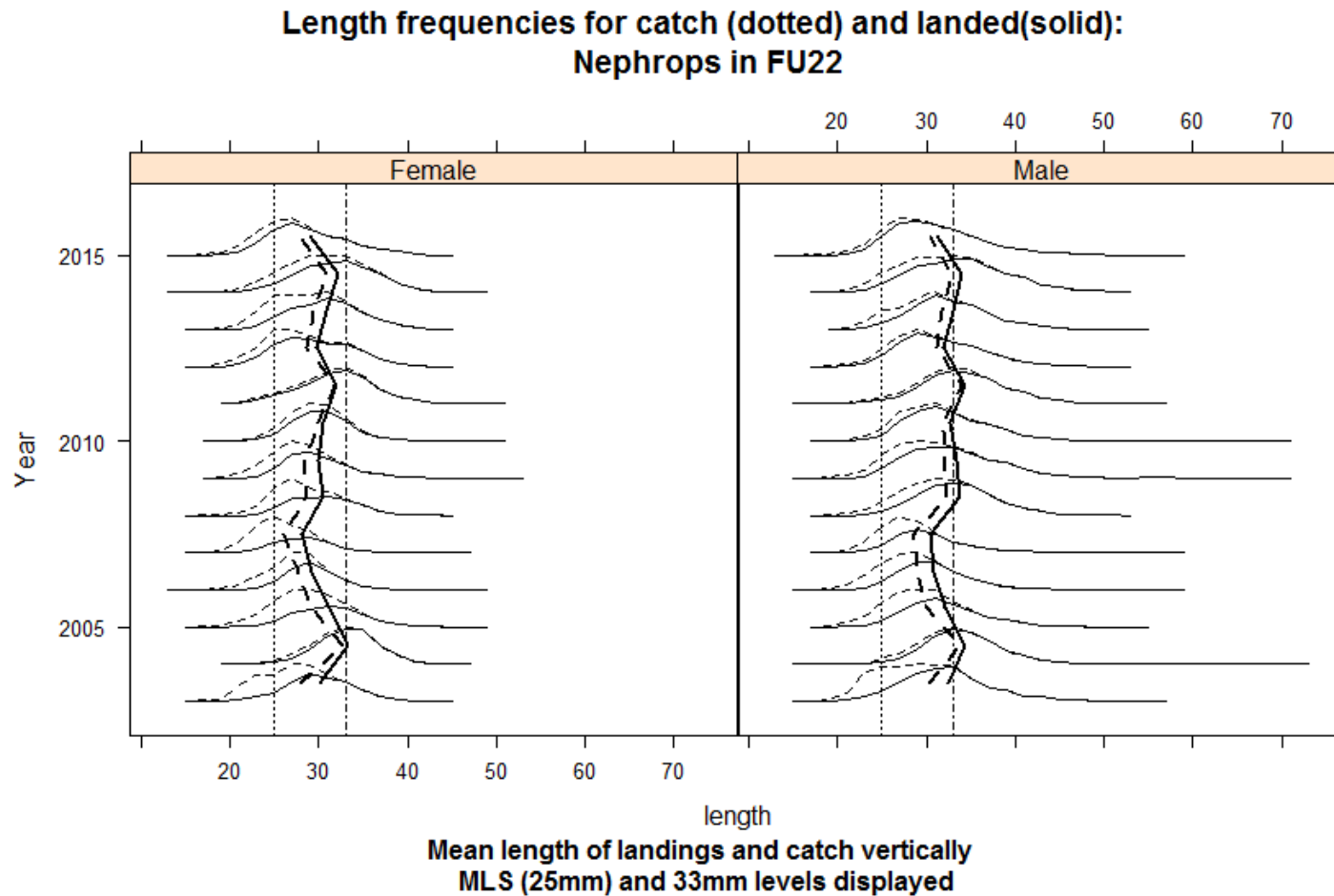
Data to WGCSE: Sex ratio
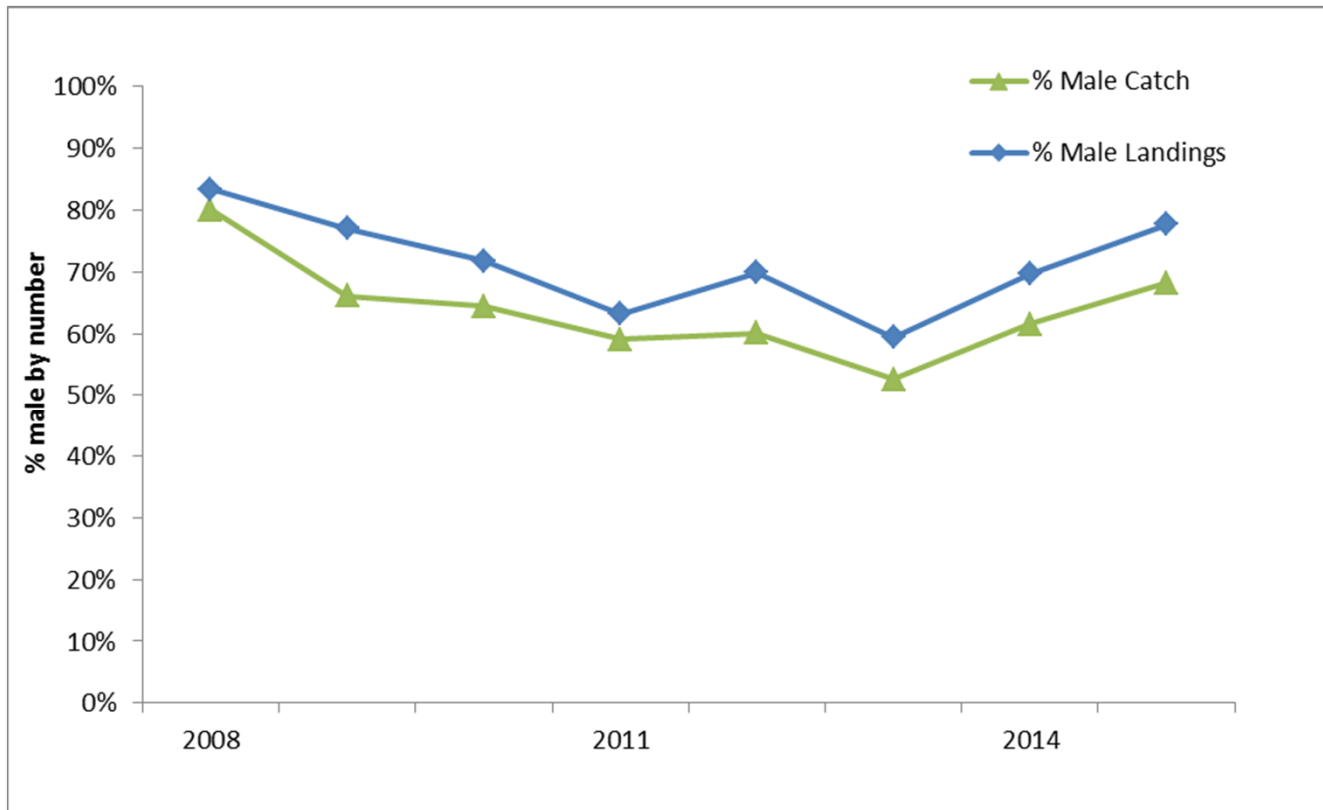
Data to WGCSE: Mean weights (gr) to generate catch options

FU - WGCSE 2016 Mean weights used to generate 2016 Catch options

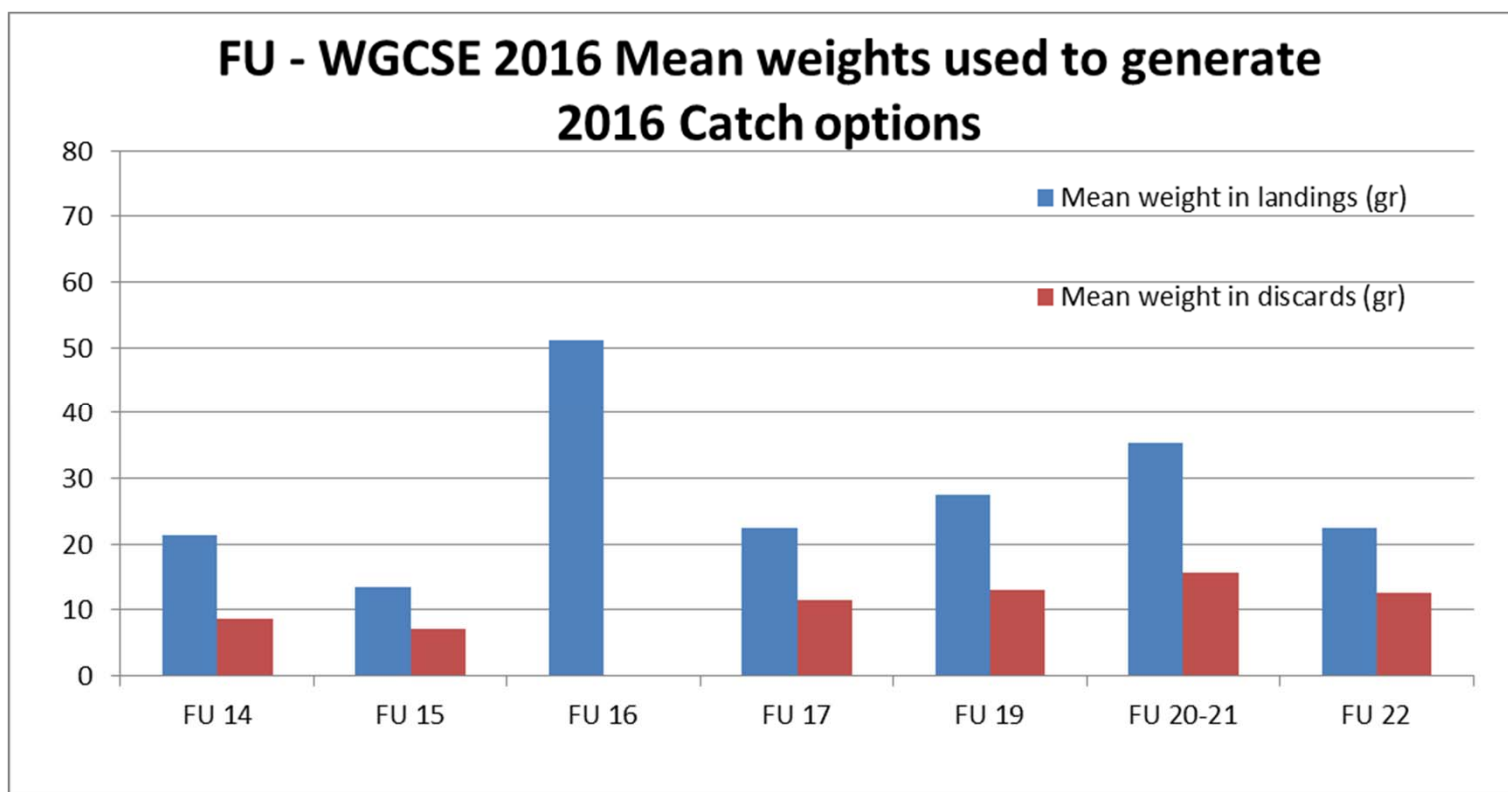Table 7.5.6. *Nephrops* in FU17 (Aran Grounds). Forecast inputs (bold) and historical estimates of mean weight in landings and harvest ratio. Removals estimated in years with no sampling (shaded) using ratio of removals to landings in adjacent years.

Year	Landings in Number (millions)	Discards in Number (millions)	Removals in Number (millions)	Prop Removals Retained	Adjusted Survey (millions)	Harvest Ratio	Landings (t)	Discards (t)	Mean Weight in landings (gr)
2001	48.7	25.4	71.6	0.68			912		
2002	54.5	17.7	70.4	0.77	629	11.2%	1,152	192	21.2
2003	44.1	18.3	60.6	0.73	761	8.0%	933	183	21.2
2004	29.0	11.4	39.3	0.74	1075	3.7%	525	112	18.1
2005	42.4	19.7	60.1	0.70	818	7.4%	778	182	18.4
2006	na	na	49.5	na	474	10.4%	636	na	na
2007	na	na	57.3	na	697	8.2%	913	na	na
2008	46.9	21.6	66.3	0.71	412	16.1%	1,050	245	23.4
2009	23.5	15.7	37.6	0.62	552	6.8%	625	256	26.6
2010	41.0	13.3	53.0	0.77	636	8.3%	1,000	194	24.4
Avg 08-10				0.70					24.46

na= not available due to non-cooperation with sampling programmes.

Shading indicates removal estimated based on combined 2005 and 2008 numbers-at-length scaled appropriately to landings in 2006 and 2007. The commensurate harvest ratio estimate is also shaded.

Table 7.5.7. *Nephrops* in FU 17 (Aran Grounds). Catch option table for 2012.

	Harvest rate	Survey Index (millions)	Implied fishery	
			Retained number (millions)	Landings (tonnes)
MSY framework	10.5%	636	47	1,146
F_{2010}	10.4%	636	46	1,134
$F_{0.1\ Combined}$	7.2%	636	32	786
$F_{max\ Combined}$	11.1%	636	50	1,212
	0%	636	0	0
	2%	636	9	218
	4%	636	18	437
	6%	636	27	655
	8%	636	36	873
	10%	636	45	1,092
	12%	636	54	1,310

		Basis
Landings Mean Weight (Kg)	0.0245	Sampling 2008–2010
Survey Overestimate Bias	1.30	WKNEPH 2009
Survey Numbers (Millions)	827	UWTV Survey 2010
Prop. Retained by the Fishery	0.70	Sampling 2008–2010

!!Happy Sampling!!

Reminders

- If vessel not on dropdown – contact Chris before working up sample.

- Do not upload any sample that has vessel unknown.

- Any new "Fishing grounds" need to be geo-referenced by ICES statistical rectangle, FU, ICES area. This information to be sent to Chris and Jennifer.

- There will be further QC checks put in place in NEMESYS mid 2013.

SAMPLE-CYCLE

- Ensure that you are spreading the sampling effort across the main vessels in your area. No over-reliance from local vessels.

- Ensure that sampling covers seasonal fluctuations.

- No gaps in sampling please.

- Fleet is highly mobile so keep in touch with colleagues.

- When you are away from port please handover sampling duties in timely manner.

- Maintain up to date sampling levels spreadsheet on network.

- Any problems get in touch with JD and Chris.

- www.marinetraffic.com for fleet activity