

RESEARCH VESSEL PROGRAMME

**RV CEFAS ENDEAVOUR
Survey: C END 10 - 2018**

STAFF:

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DURATION: 19 – 26 June 2018

LOCATION: North Sea (English NE)

AIMS:

1. To conduct a standard underwater TV survey of *Nephrops* burrow densities on the Farn Deep grounds, 55° 35' - 54° 45' N and 1° 30' - 0° 40' W, and to evaluate *Nephrops* abundance (110 stations).
2. Secondary: To conduct a standard underwater TV survey of additional stations on the Botney Gut / Silver Pit grounds 53° 45' - 54° 15' N and 1° 25' - 2° 55' E (shown in figure 2) if time allows.
3. Secondary: To conduct a standard underwater TV survey of additional stations on the Farn Deep grounds (as per objective 1, highlighted red on figure 2), if time allows

PLAN:

CEFAS ENDEAVOUR will sail on 19th June from Lowestoft and will return to the same port on 26th June 2018. This survey involves 24-hour procedures and the scientific staff will be working 4/8 hours shifts (2 people per shift).

Objectives 1, 2 & 3:

1. Video data will be collected from cameras mounted on a towed sledge. On the Farn Deep grounds, 110 stations will be visited with the aim of recording a clear 10-minute continuous video transect of the sea bed at each station (Figure 1, Table 1).
2. All video will be analysed, and the counts confirmed at sea. Data will be entered and QC'd onboard. Cefas carried out a survey of the Silver Pit/Botney Gut grounds between 2011 and 2013. If time allows, we will collect TV footage from the same area (figure 2, Table 2).
3. NEIFCA carry out a September/October annual TV survey on inshore *Nephrops* grounds. If time allows we will collect TV footage from these additional stations to allow comparisons of burrow densities between June and October.

GEAR:

TV sledge: The sledge will be towed (0.7 Knot) against the tide and 10 minutes of good footage will be recorded, this corresponds to ~ 200m of track.

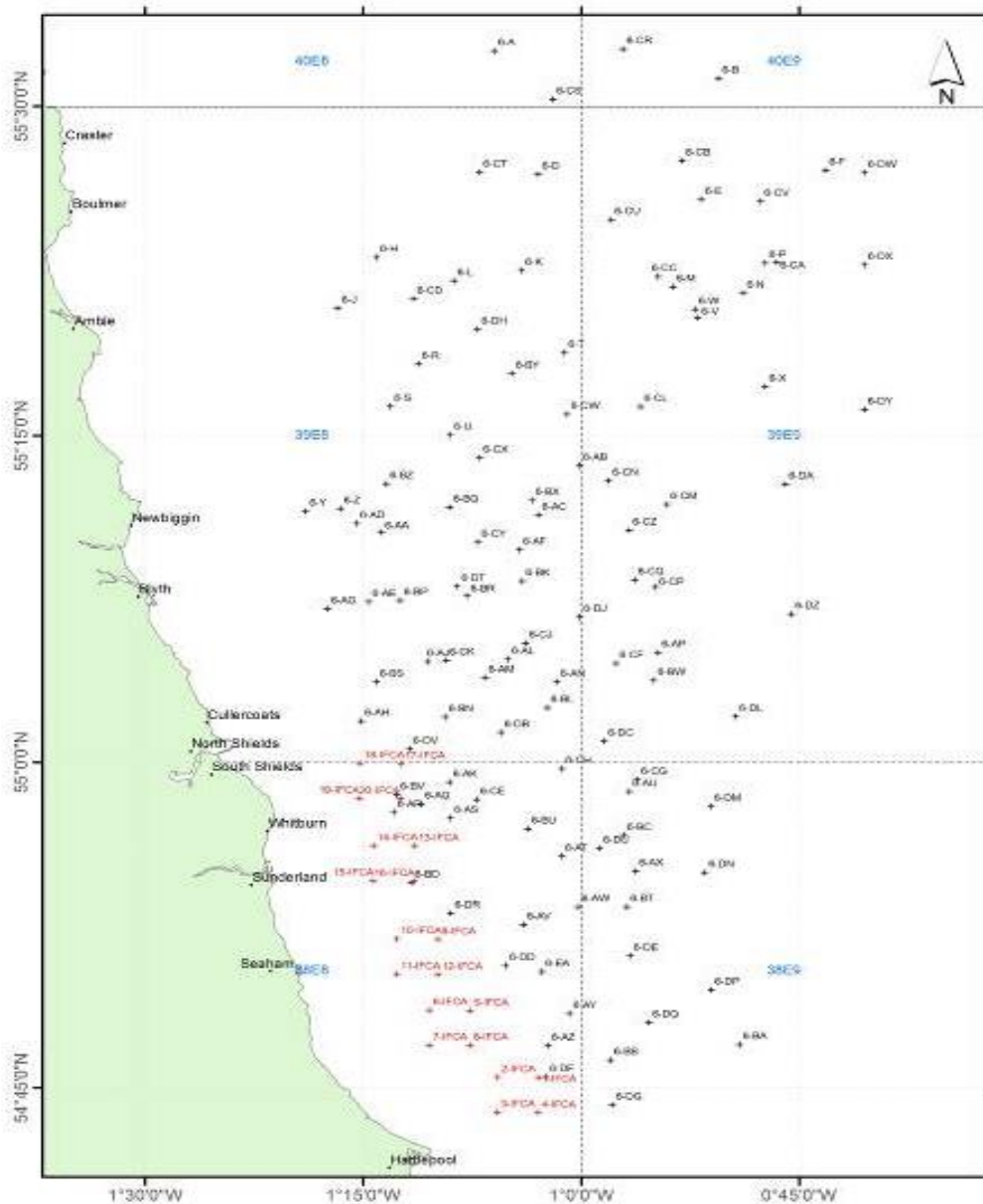


Figure 1. C End 10/18 final stations for Farn Deeps area (FU6), additional (secondary) stations in red.

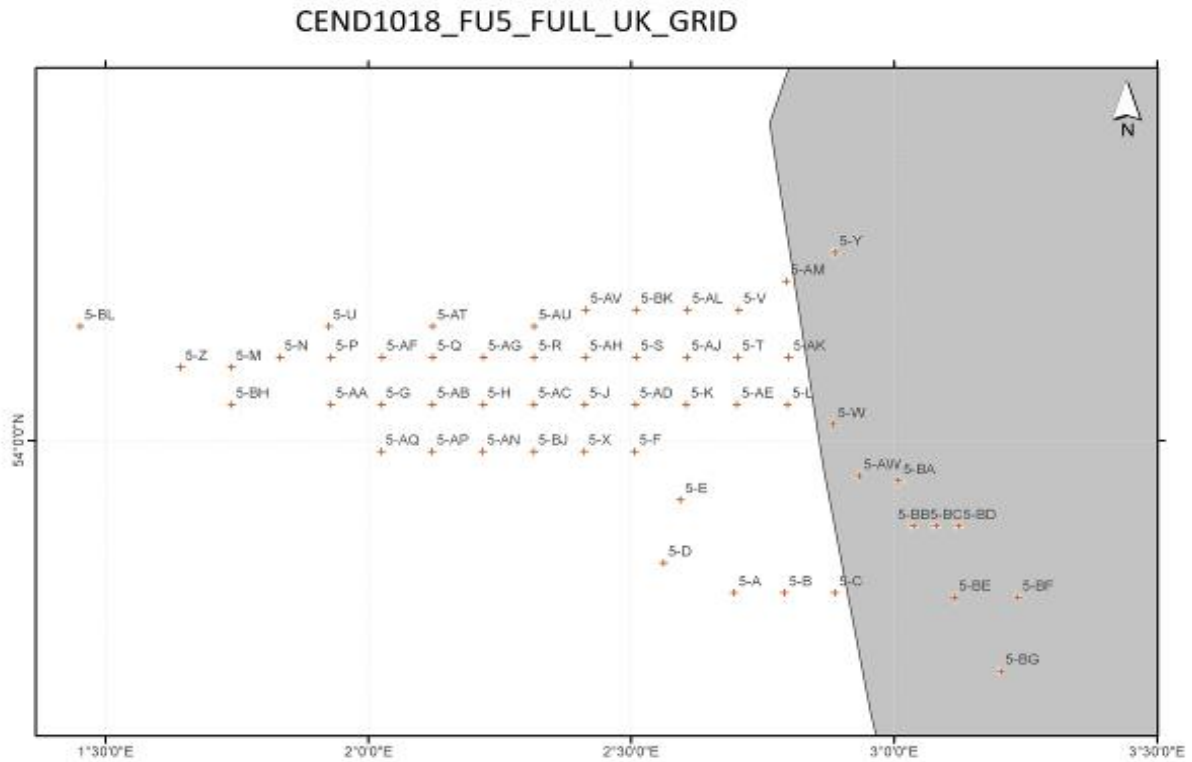


Figure 2. C End 10/18 final stations for Silver Pit / Botney Gut area (FU5) – to west of greyed area.

Chris Firmin
(Scientist-in-Charge)
16 May 2018

DISTRIBUTION:

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MMO (North Shields)
NE IFCA

Table 1. C END 10/18 station positions for the Farn Deeps (Fu6) area.

Area	TVID	LatD	LatM	LongD	LongM	DecLat	DecLong
FU6	6-A	55	32.5405	-1	5.9825	55.5423	-1.0997
FU6	6-B	55	31.2705	0	50.536	55.5212	-0.8423
FU6	6-D	55	26.9245	-1	2.9665	55.4487	-1.0494
FU6	6-E	55	25.766	0	51.727	55.4294	-0.8621
FU6	6-F	55	27.115	0	43.166	55.4519	-0.7194
FU6	6-H	55	23.1485	-1	14.108	55.3858	-1.2351
FU6	6-J	55	20.8195	-1	16.773	55.347	-1.2795
FU6	6-K	55	22.5425	-1	4.1145	55.3757	-1.0686
FU6	6-L	55	22.075	-1	8.77	55.3679	-1.1462
FU6	6-M	55	21.8065	0	53.66	55.3634	-0.8943
FU6	6-N	55	21.5175	0	48.839	55.3586	-0.814
FU6	6-P	55	22.8875	0	47.3105	55.3815	-0.7885
FU6	6-R	55	18.277	-1	11.2245	55.3046	-1.1871
FU6	6-S	55	16.3355	-1	13.155	55.2723	-1.2193
FU6	6-T	55	18.7905	-1	1.1415	55.3132	-1.019
FU6	6-U	55	15.027	-1	9	55.2504	-1.15
FU6	6-V	55	20.3955	0	51.96	55.3399	-0.866
FU6	6-W	55	20.764	0	52.156	55.3461	-0.8693
FU6	6-X	55	17.2445	0	47.312	55.2874	-0.7885
FU6	6-Y	55	11.552	-1	18.957	55.1925	-1.316
FU6	6-Z	55	11.6655	-1	16.593	55.1944	-1.2766
FU6	6-AA	55	10.5855	-1	13.7555	55.1764	-1.2293
FU6	6-AB	55	13.6265	-1	0.093	55.2271	-1.0016
FU6	6-AC	55	11.3755	-1	2.935	55.1896	-1.0489
FU6	6-AD	55	10.9925	-1	15.4685	55.1832	-1.2578
FU6	6-AE	55	7.393	-1	14.626	55.1232	-1.2438
FU6	6-AF	55	9.7795	-1	4.247	55.163	-1.0708
FU6	6-AG	55	7.076	-1	17.4725	55.1179	-1.2912
FU6	6-AH	55	1.9165	-1	15.132	55.0319	-1.2522
FU6	6-AJ	55	4.65	-1	10.57	55.0775	-1.1762
FU6	6-AK	54	59.104	-1	9.079	54.9851	-1.1513
FU6	6-AL	55	4.758	-1	5.048	55.0793	-1.0841
FU6	6-AM	55	3.919	-1	6.626	55.0653	-1.1104
FU6	6-AN	55	3.7155	-1	1.6815	55.0619	-1.028
FU6	6-AP	55	5.064	0	54.6885	55.0844	-0.9115
FU6	6-AQ	54	58.1145	-1	11.0145	54.9686	-1.1836
FU6	6-AR	54	57.71	-1	12.9065	54.9618	-1.2151
FU6	6-AS	54	57.4505	-1	9.0015	54.9575	-1.15
FU6	6-AT	54	55.703	-1	1.3515	54.9284	-1.0225
FU6	6-AU	54	58.6765	0	56.68	54.9779	-0.9447
FU6	6-AV	54	52.5465	-1	3.971	54.8758	-1.0662
FU6	6-AW	54	53.369	-1	0.185	54.8895	-1.0031



FU6	6-AX	54	55.0255	0	56.2345	54.9171	-0.9372
FU6	6-AY	54	48.4275	-1	0.8005	54.8071	-1.0133
FU6	6-AZ	54	46.949	-1	2.28	54.7825	-1.038
FU6	6-BA	54	46.9985	0	49.096	54.7833	-0.8183
FU6	6-BB	54	46.294	0	57.99	54.7716	-0.9665
FU6	6-BC	54	56.656	0	57.066	54.9443	-0.9511
FU6	6-BD	54	54.48	-1	11.704	54.908	-1.1951
FU6	6-BK	55	8.3505	-1	4.068	55.1392	-1.0678
FU6	6-BL	55	2.5395	-1	2.3485	55.0423	-1.0391
FU6	6-BN	55	2.102	-1	9.3845	55.035	-1.1564
FU6	6-BP	55	7.4605	-1	12.468	55.1243	-1.2078
FU6	6-BQ	55	11.7365	-1	9.0545	55.1956	-1.1509
FU6	6-BR	55	7.6645	-1	7.8575	55.1277	-1.131
FU6	6-BS	55	3.713	-1	14.1035	55.0619	-1.2351
FU6	6-BT	54	53.3655	0	56.8425	54.8894	-0.9474
FU6	6-BU	54	56.9725	-1	3.654	54.9495	-1.0609
FU6	6-BV	54	58.537	-1	12.695	54.9756	-1.2116
FU6	6-BW	55	3.7895	0	54.9875	55.0632	-0.9165
FU6	6-BX	55	12.0335	-1	3.393	55.2006	-1.0565
FU6	6-BY	55	17.8435	-1	4.767	55.2974	-1.0794
FU6	6-BZ	55	12.803	-1	13.43	55.2134	-1.2238
FU6	6-CA	55	22.928	0	46.5375	55.3821	-0.7756
FU6	6-CB	55	27.5395	0	53.034	55.459	-0.8839
FU6	6-CC	55	22.2735	0	54.6865	55.3712	-0.9114
FU6	6-CD	55	21.2535	-1	11.555	55.3542	-1.1926
FU6	6-CE	54	58.309	-1	7.208	54.9718	-1.1201
FU6	6-CF	55	4.576	0	57.598	55.0763	-0.96
FU6	6-CG	54	59.227	0	56.138	54.9871	-0.9356
FU6	6-CH	54	59.7265	-1	1.317	54.9954	-1.022
FU6	6-CJ	55	5.5165	-1	3.8465	55.0919	-1.0641
FU6	6-CK	55	4.7055	-1	9.294	55.0784	-1.1549
FU6	6-CL	55	16.335	0	55.915	55.2722	-0.9319
FU6	6-CM	55	11.855	0	54.075	55.1976	-0.9013
FU6	6-CN	55	12.935	0	58.1	55.2156	-0.9683
FU6	6-CP	55	8.08	0	54.88	55.1347	-0.9147
FU6	6-CQ	55	8.415	0	56.32	55.1402	-0.9387
FU6	6-CR	55	32.6215	0	57.115	55.5437	-0.9519
FU6	6-CS	55	30.33	-1	1.9465	55.5055	-1.0324
FU6	6-CT	55	27.0125	-1	6.991	55.4502	-1.1165
FU6	6-CU	55	24.8635	0	57.931	55.4144	-0.9655
FU6	6-CV	55	25.679	0	47.6245	55.428	-0.7937
FU6	6-CW	55	15.9795	-1	0.9605	55.2663	-1.016
FU6	6-CX	55	14	-1	6.985	55.2333	-1.1164
FU6	6-CY	55	10.1215	-1	7.114	55.1687	-1.1186



FU6	6-CZ	55	10.674	0	56.682	55.1779	-0.9447
FU6	6-DA	55	12.7935	0	45.923	55.2132	-0.7654
FU6	6-DB	55	1.4035	-1	5.521	55.0234	-1.092
FU6	6-DC	55	0.9965	0	58.398	55.0166	-0.9733
FU6	6-DD	54	50.6505	-1	5.2015	54.8442	-1.0867
FU6	6-DE	54	51.1	0	56.628	54.8517	-0.9438
FU6	6-DF	54	45.512	-1	2.411	54.7585	-1.0402
FU6	6-DG	54	44.203	0	57.856	54.7367	-0.9643
FU6	6-DH	55	19.8625	-1	7.126	55.331	-1.1188
FU6	6-DJ	55	6.7	-1	0.0835	55.1117	-1.0014
FU6	6-DL	55	2.1165	0	49.3725	55.0353	-0.8229
FU6	6-DM	54	57.989	0	51.0605	54.9665	-0.851
FU6	6-DN	54	54.944	0	51.4915	54.9157	-0.8582
FU6	6-DP	54	49.539	0	51.036	54.8257	-0.8506
FU6	6-DQ	54	48.0295	0	55.339	54.8005	-0.9223
FU6	6-DR	54	53.075	-1	8.97	54.8846	-1.1495
FU6	6-DT	55	8.1025	-1	8.5145	55.135	-1.1419
FU6	6-DU	54	56.0585	0	58.7305	54.9343	-0.9788
FU6	6-DV	55	0.638	-1	11.827	55.0106	-1.1971
FU6	6-DW	55	27	0	40.5	55.45	-0.675
FU6	6-DX	55	22.8	0	40.5	55.38	-0.675
FU6	6-DY	55	16.2	0	40.5	55.27	-0.675
FU6	6-DZ	55	6.8311	0	45.5009	55.1139	-0.75835
FU6	6-EA	54	50.364	-1	2.6958	54.8394	-1.04493
FU6 - Optional	1-IFCA	54	45.479	-1	2.94	54.75798	-1.049
FU6 - Optional	2-IFCA	54	45.496	-1	5.75	54.75827	-1.09583
FU6 - Optional	3-IFCA	54	43.878	-1	5.781	54.7313	-1.09635
FU6 - Optional	4-IFCA	54	43.858	-1	2.978	54.73097	-1.04963
FU6 - Optional	5-IFCA	54	48.572	-1	7.638	54.80953	-1.1273
FU6 - Optional	6-IFCA	54	48.597	-1	10.451	54.80995	-1.17418
FU6 - Optional	7-IFCA	54	46.973	-1	10.467	54.78288	-1.17445
FU6 - Optional	8-IFCA	54	46.97	-1	7.658	54.78283	-1.12763
FU6 - Optional	9-IFCA	54	51.866	-1	9.867	54.86443	-1.16445
FU6 - Optional	10-IFCA	54	51.888	-1	12.686	54.8648	-1.21143
FU6 - Optional	11-IFCA	54	50.265	-1	12.692	54.83775	-1.21153
FU6 - Optional	12-IFCA	54	50.232	-1	9.846	54.8372	-1.1641
FU6 - Optional	13-IFCA	54	56.184	-1	11.477	54.9364	-1.19128
FU6 - Optional	14-IFCA	54	56.194	-1	14.297	54.93657	-1.23828
FU6 - Optional	15-IFCA	54	54.572	-1	14.329	54.90953	-1.23882
FU6 - Optional	16-IFCA	54	54.55	-1	11.514	54.90917	-1.1919
FU6 - Optional	17-IFCA	54	59.965	-1	12.4	54.99942	-1.20667
FU6 - Optional	18-IFCA	54	59.977	-1	15.227	54.99962	-1.25378
FU6 - Optional	19-IFCA	54	58.368	-1	15.256	54.9728	-1.25427
FU6 - Optional	20-IFCA	54	58.35	-1	12.454	54.9725	-1.20757

Table 2. CEND 10/18 station positions for the Silver Pit / Botney Gut (FU5) area.

Area	TVID	LatD	LatM	LongD	LongM	DecLat	DecLong
FU5 - Optional	5-A	53	48.99971	2	41.77384	53.81666	2.696231
FU5 - Optional	5-B	53	48.99971	2	47.5351	53.81666	2.792252
FU5 - Optional	5-C	53	48.99971	2	53.29635	53.81666	2.888273
FU5 - Optional	5-D	53	51.14852	2	33.76303	53.85248	2.562717
FU5 - Optional	5-E	53	55.72833	2	35.68491	53.92881	2.594748
FU5 - Optional	5-F	53	59.19983	2	30.46323	53.98666	2.50772
FU5 - Optional	5-G	54	2.599869	2	1.57083	54.04333	2.026181
FU5 - Optional	5-H	54	2.599869	2	13.15624	54.04333	2.219271
FU5 - Optional	5-J	54	2.599869	2	24.74165	54.04333	2.412361
FU5 - Optional	5-K	54	2.599869	2	36.32707	54.04333	2.605451
FU5 - Optional	5-L	54	2.599869	2	47.91248	54.04333	2.798541
FU5 - Optional	5-M	54	5.288102	1	44.44282	54.08814	1.740714
FU5 - Optional	5-N	54	5.999908	1	50.00128	54.1	1.833355
FU5 - Optional	5-P	54	5.999908	1	55.80191	54.1	1.930032
FU5 - Optional	5-Q	54	5.999908	2	7.403183	54.1	2.123386
FU5 - Optional	5-R	54	5.999908	2	19.00446	54.1	2.316741
FU5 - Optional	5-S	54	5.999908	2	30.60574	54.1	2.510096
FU5 - Optional	5-T	54	5.999908	2	42.207	54.1	2.70345
FU5 - Optional	5-U	54	8.223658	1	55.55571	54.13706	1.925928
FU5 - Optional	5-V	54	9.399948	2	42.29453	54.15667	2.704909
FU5 - Optional	5-X	53	59.19983	2	24.67843	53.98666	2.411307
FU5 - Optional	5-AA	54	2.599869	1	55.77812	54.04333	1.929635
FU5 - Optional	5-AB	54	2.599869	2	7.363529	54.04333	2.122725
FU5 - Optional	5-AC	54	2.599869	2	18.94894	54.04333	2.315816
FU5 - Optional	5-AD	54	2.599869	2	30.53435	54.04333	2.508906
FU5 - Optional	5-AE	54	2.599869	2	42.11978	54.04333	2.701996
FU5 - Optional	5-AF	54	5.999908	2	1.602545	54.1	2.026709
FU5 - Optional	5-AG	54	5.999908	2	13.20382	54.1	2.220064
FU5 - Optional	5-AH	54	5.999908	2	24.8051	54.1	2.413418
FU5 - Optional	5-AJ	54	5.999908	2	36.40636	54.1	2.606773
FU5 - Optional	5-AK	54	5.999908	2	48.00764	54.1	2.800127
FU5 - Optional	5-AL	54	9.399948	2	36.48594	54.15667	2.608099
FU5 - Optional	5-AM	54	11.4602	2	47.73984	54.191	2.795664
FU5 - Optional	5-AN	53	59.19983	2	13.10882	53.98666	2.21848
FU5 - Optional	5-AP	53	59.19983	2	7.324019	53.98666	2.122067
FU5 - Optional	5-AQ	53	59.19983	2	1.539216	53.98666	2.025654
FU5 - Optional	5-AT	54	8.223658	2	7.403183	54.13706	2.123386
FU5 - Optional	5-AU	54	8.223658	2	19.00446	54.13706	2.316741



FU5 - Optional	5-AV	54	9.399948	2	24.86876	54.15667	2.414479
FU5 - Optional	5-W	54	1.1741	2	53.09972	54.01957	2.884995
FU5 - Optional	5-Y	54	13.52044	2	53.29635	54.22534	2.888273
FU5 - Optional	5-Z	54	5.288102	1	38.64219	54.08814	1.644037
FU5 - Optional	5-AW	53	57.45054	2	56.07798	53.95751	2.934633
FU5 - Optional	5-BA	53	57.10584	3	0.55878	53.95176	3.009313
FU5 - Optional	5-BB	53	53.83146	3	2.2821	53.89719	3.038035
FU5 - Optional	5-BC	53	53.83146	3	4.8672	53.89719	3.08112
FU5 - Optional	5-BD	53	53.83146	3	7.45224	53.89719	3.124204
FU5 - Optional	5-BE	53	48.66132	3	6.93522	53.81102	3.115587
FU5 - Optional	5-BF	53	48.66132	3	14.17344	53.81102	3.236224
FU5 - Optional	5-BG	53	43.31886	3	12.27768	53.72198	3.204628
FU5 - Optional	5-BH	54	2.599869	1	44.44282	54.04333	1.740714
FU5 - Optional	5-BJ	53	59.19983	2	18.94894	53.98666	2.315816
FU5 - Optional	5-BK	54	9.399948	2	30.60574	54.15667	2.510096
FU5 - Optional	5-BL	54	8.223658	1	27.15174	54.13706	1.452529