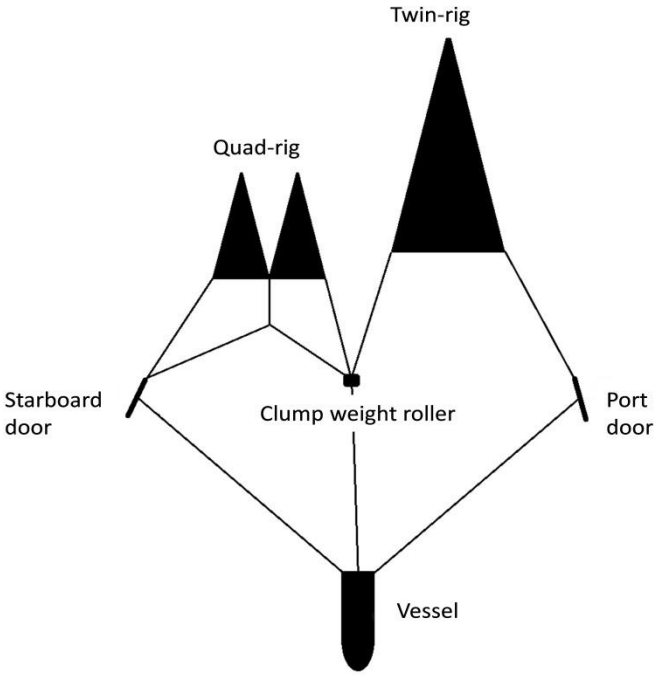
BIM *Nephrops* Gear Trials

- Key drivers
  - Legislation
    - Landing obligation
    - Cod management plan Irish Sea
  - Sustainability
  - Economics
- Key issues
  - Fish discards
  - *Nephrops* discards

Key trials in 2014

- Quad v Twin – rig trawl
- 300 mm square mesh panel
- 70 mm – 100 mm diamond codend mesh size
- Square mesh cod-ends and sorting grid

Catch comparison of Quad and Twin-rig trawls in the Celtic Sea *Nephrops* Fishery



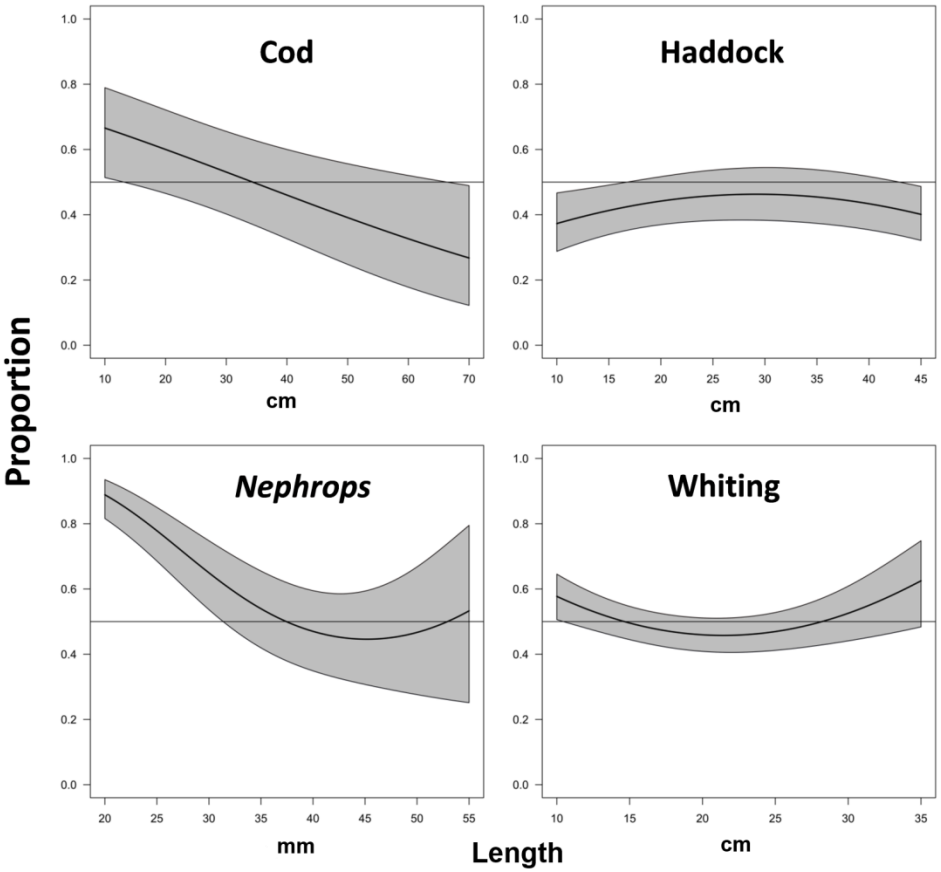
- Two gears towed simultaneously
- Thirty hauls carried out over a 5 day period in April 2014
- Total catches compared

Results

Species	Twin-rig (kg)	Quad-rig (kg)	Difference (%)
Cod	137	53	-61
Haddock	428	266	-38
Whiting	259	252	-3
Hake	108	63	-42
Ling	109	37	-66
Monkfish	124	109	-12
Witch	59	41	-31
Plaice	36	38	6
Lemon sole	16	16	0
Black sole	10	13	30
Nephrops			
10 – 30/kg	233	330	41
30 – 40/kg	92	120	30
40 – 50/kg	54	87	61
Tails (live weight)	90	185	106
Total *Nephrops*	469	722	54

- Major reductions in quantities of whitefish in the Quad-rig
- Major increases in *Nephrops*
- Similar catches of whiting

Results



- Significant differences in the catch composition of cod, haddock and *Nephrops* (GLMM: P <0.05)
- No significant difference for whiting
- Higher proportions of juvenile cod and *Nephrops* in the Quad-rig

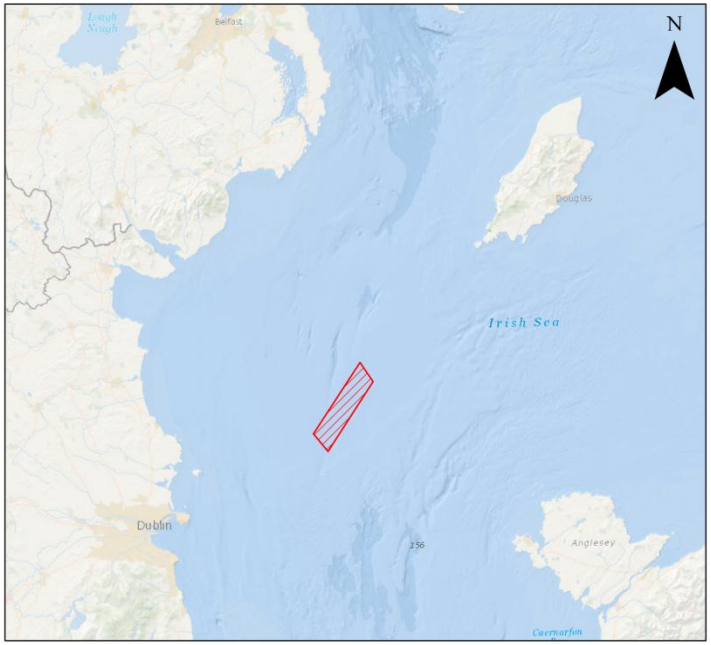
Trial Conclusions

- Similar results to North Sea (cod↓ 60%, Nephrops ↑100%)
- Whiting↓ 60% in the North Sea
- Whiting mainly < 27cm in Irish trial
- Overall benefits in relation to LO but more work needed on small fish and Nephrops

Assessment of a 300 mm square-mesh panel (SMP) in the Irish Sea *Nephrops* fishery

- Cod management plan permits exemptions from effort restrictions for highly selective gears
- The 300 mm SMP looks promising
- Need to test this gear in an Irish context and also assess potential benefits in relation to the LO

Methods



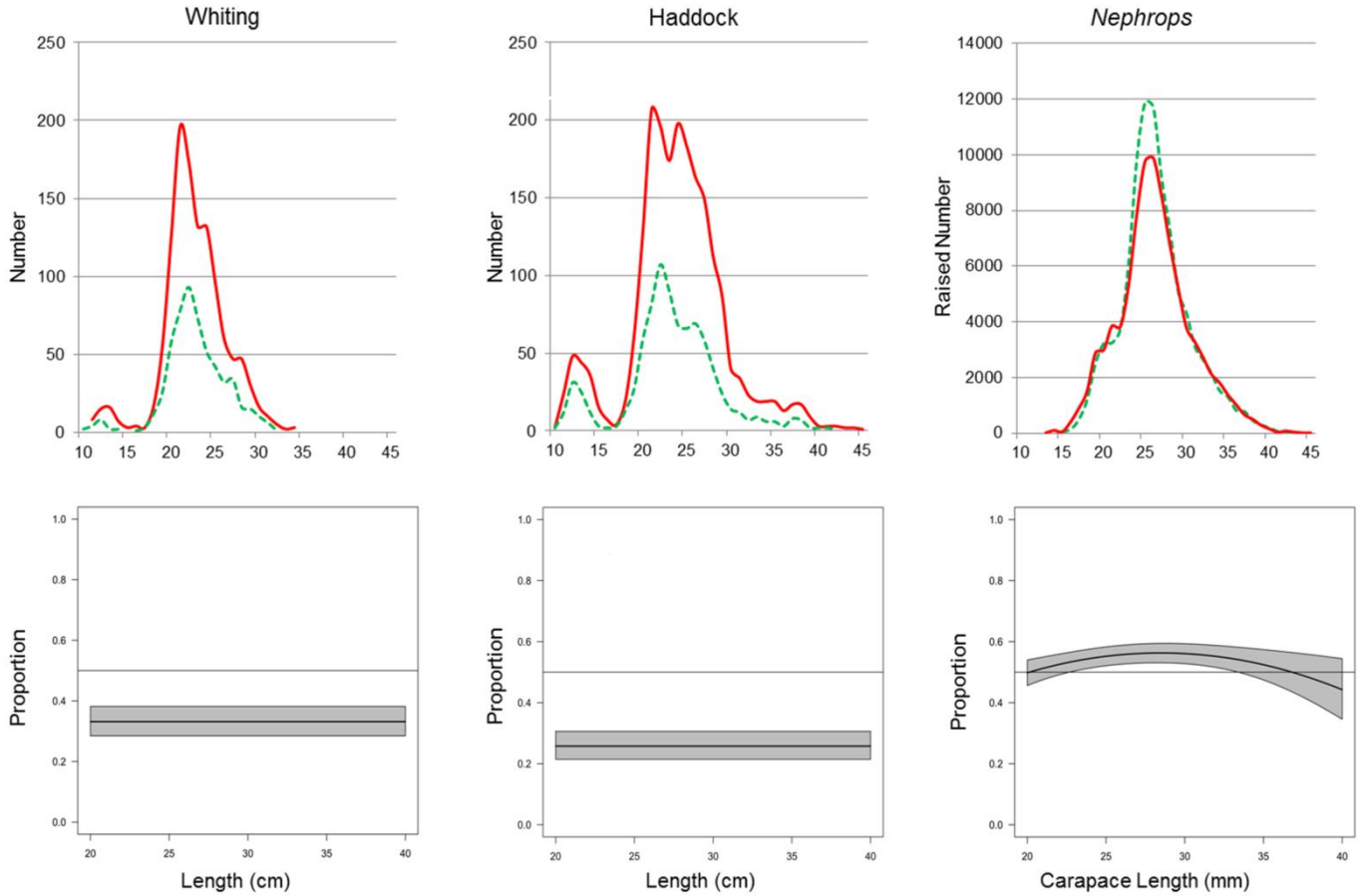
- A 300 mm SMP deployed 9 – 12 m from the cod line was compared to a control trawl with no SMP in Quad-rig trawls
- A total of 23 hauls carried out over a 4 day period in August
- Total catches compared

Results

Species	Control (kg)	300 mm SMP (kg)	Difference (%)
Whiting	136	66	-52
Haddock	214	65	-70
Nephrops	1106	1262	14
Cod	2	1	-50
Witch	116	76	-34
Monk	27	25	-7
Plaice	26	12	-55
Bulk catch	2043	1800	-12

- Major reductions in quantities of whiting and haddock
- Cod catches low
- No reduction in *Nephrops*
- Flatfish catches also reduced

Results



- Over 80% of whiting and haddock were below MLS
- Reductions in catches were consistent across length classes
- Significant different across gear types in all cases (GLMM: $P < 0.05$)

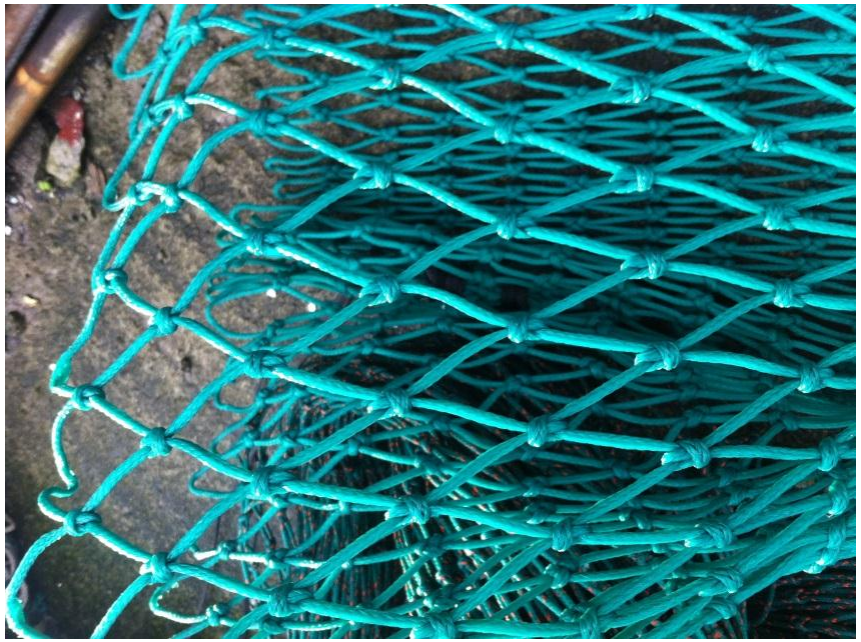
Trial Conclusions

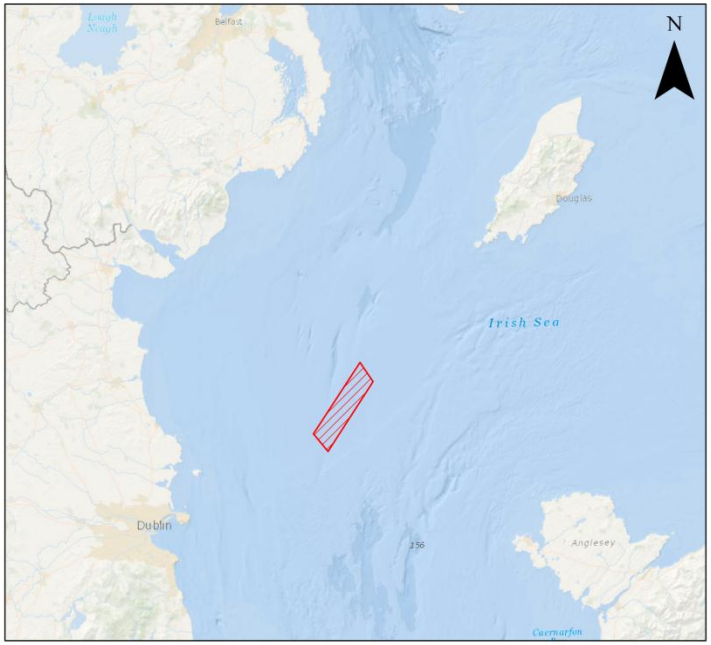
- Good potential as an exempted gear
- Substantial reductions in whiting and haddock good for LO

Preliminary Assessment of 70 mm – 100 mm diamond codend mesh size in the Irish Sea *Nephrops* fishery

- Much debate around the effect of diamond mesh size on *Nephrops* catches
- Literature suggests that selectivity is poor
- Need to evaluate this issue in an Irish context

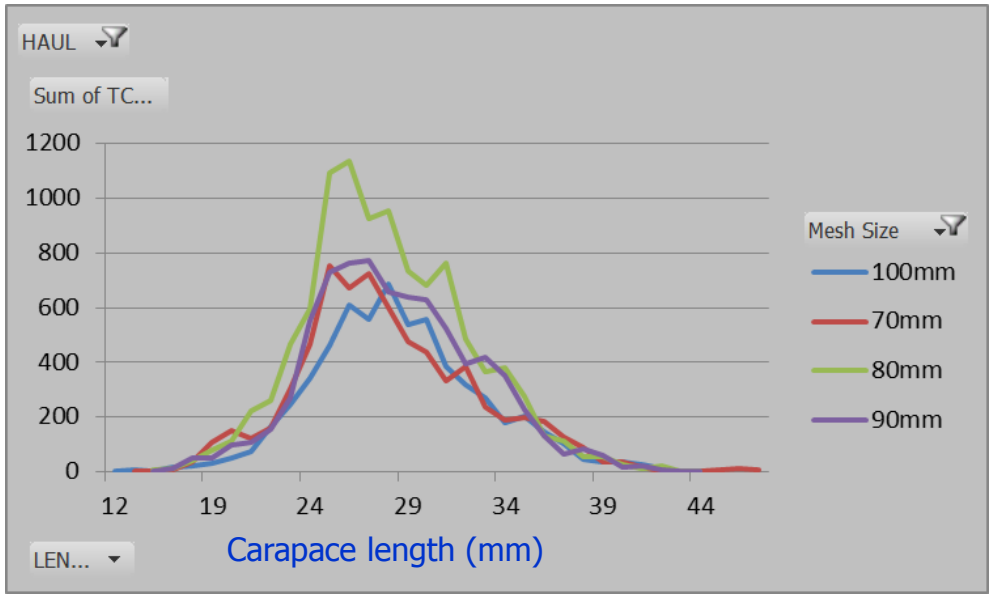
Methods





- A total of 5 hauls carried out in August 2014
- 70 mm, 80 mm, 90 mm and 100 mm cod-ends tested in Quad-rig trawls
- Very preliminary analyses conducted

Results *Nephrops*



GLM Mean Length

Source	Sum-of-Squares	df	Mean-Square	F-ratio	P
HAUL$	23.126	4	5.781	5.131	0.012
MESH$	1.482	3	0.494	0.438	0.730
Error	13.522	12	1.127		

GLM Mean Weight

Source	Sum-of-Squares	df	Mean-Square	F-ratio	P
HAUL$	6564.704	4	1641.176	49.408	<0.001
MESH$	377.962	3	125.987	3.793	0.04
Error	398.602	12	33.217		

Preliminary impressions

- Diamond mesh size appears to have little effect on *Nephrops* catches in Quad-rig trawls
- More comprehensive analysis in the Celtic Sea forthcoming
- Other measures needed to improve *Nephrops* selectivity
- Trial assessing square mesh codends and a sorting grid commencing soon

Overall Conclusions

- Quad-rig and 300mm SMPs greatly assist in reducing fish discards
- Some concerns with size composition of *Nephrops* in Quad-rigs
- Measures such as square mesh codends and sorting grids have potential to improve *Nephrops* selectivity
- Potential benefits in relation to the LO in the short term and stock status in the longer term