

Jack Emmerson

INNOVATION IN DATA-CAPTURE TECHNIQUES FOR STATIC-GEAR FISHERIES



Prifysgol Bangor University
School of Ocean Sciences

Fisheries & Conservation Science Group



Isle of Man
Government

Reiltys Ellan Vannin

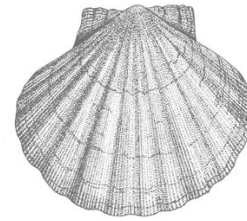
Department for Environment, Food &
Agriculture (DEFA)

Fisheries Directorate



Isle of Man: Fisheries Overview

- King Scallop (*Pecten maximus*)



Value
(2016)

£7.4 m

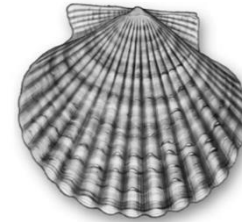
Stock
Assessed



Spatial
Data



- Queen Scallop (*Aquipecten opercularis*)



£2.2 m



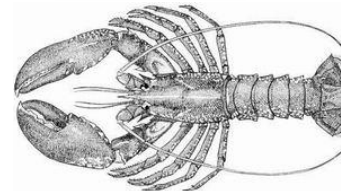
-
- Common Whelk (*Buccinum undatum*)



£0.7 m



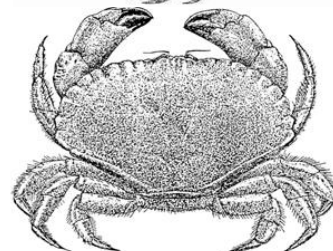
- European Lobster (*Homarus gammarus*)



£0.7 m



- Edible Crab (*Cancer pagurus*)



£0.6 m





Isle of Man: Data collection

IOM Shellfish Logbook

Monthly Shellfish Activity Log - UNDER 10 METRE VESSELS ONLY MSAL 1303

Please send this copy to DEFA within 48 hours of the end of Month

Month Year

Name of Vessel PLN

Main Port of Departure Main Port of Landing

Record of Pots SET / HAULED						Record of Species RETAINED								Comments
(1) Day	(2) Area	(3) Fishing start time	(4) Fishing end time	(5) No of Pots Set	(6) No of Pots Hauled	(7) Edible Crab (kg)		(8) Lobster (kg)		(9) Whelk (kg)		(10) Other (kg)		
						Stored	Landed	Stored	Landed	Stored	Landed	Stored	Landed	
1	37E5													
2	37E5													
3	37E5													
4	37E5													
5	37E5													
6	37E5													
7	37E5													
8	37E5													
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30	37E5													
31	37E5													

Monthly Totals by Species STORED and LANDED

Declaration: I certify that all entries are true and that any false statement will leave me liable to prosecution

Submitted by:
 Name in BLOCK LETTERS
 Signature
 Date

for official use

Comment:

Logbooks provide data on:

- ✓ Effort
- ✓ Landings
- ✓ Indications of spatial footprint

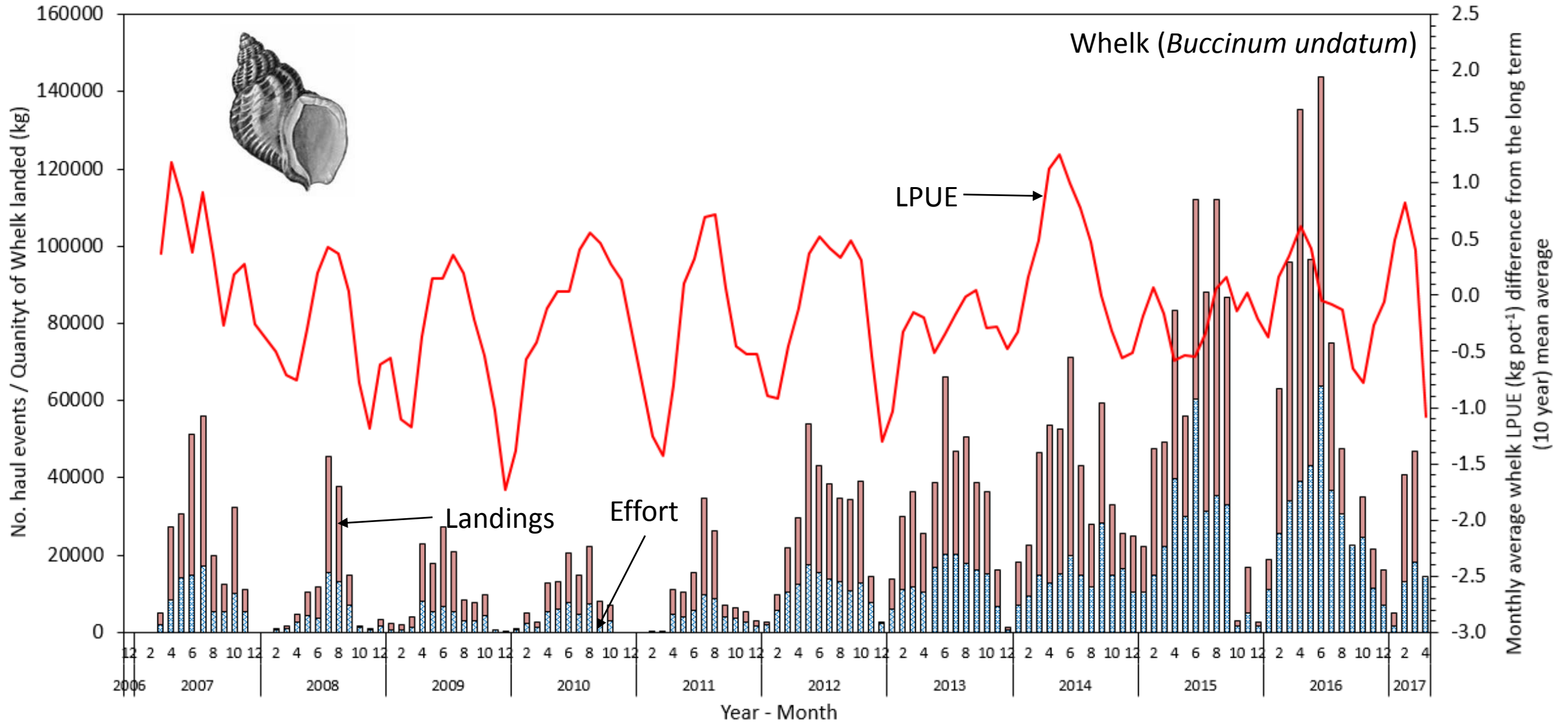
Logbooks **do not** provide data on:

- ✗ Population structure
- ✗ Breeding / spawning season
- ✗ Nursery grounds
- ✗ Recruitment
- ✗ Bycatch / discards
- ✗ Shell disease
- ✗ Environmental factors

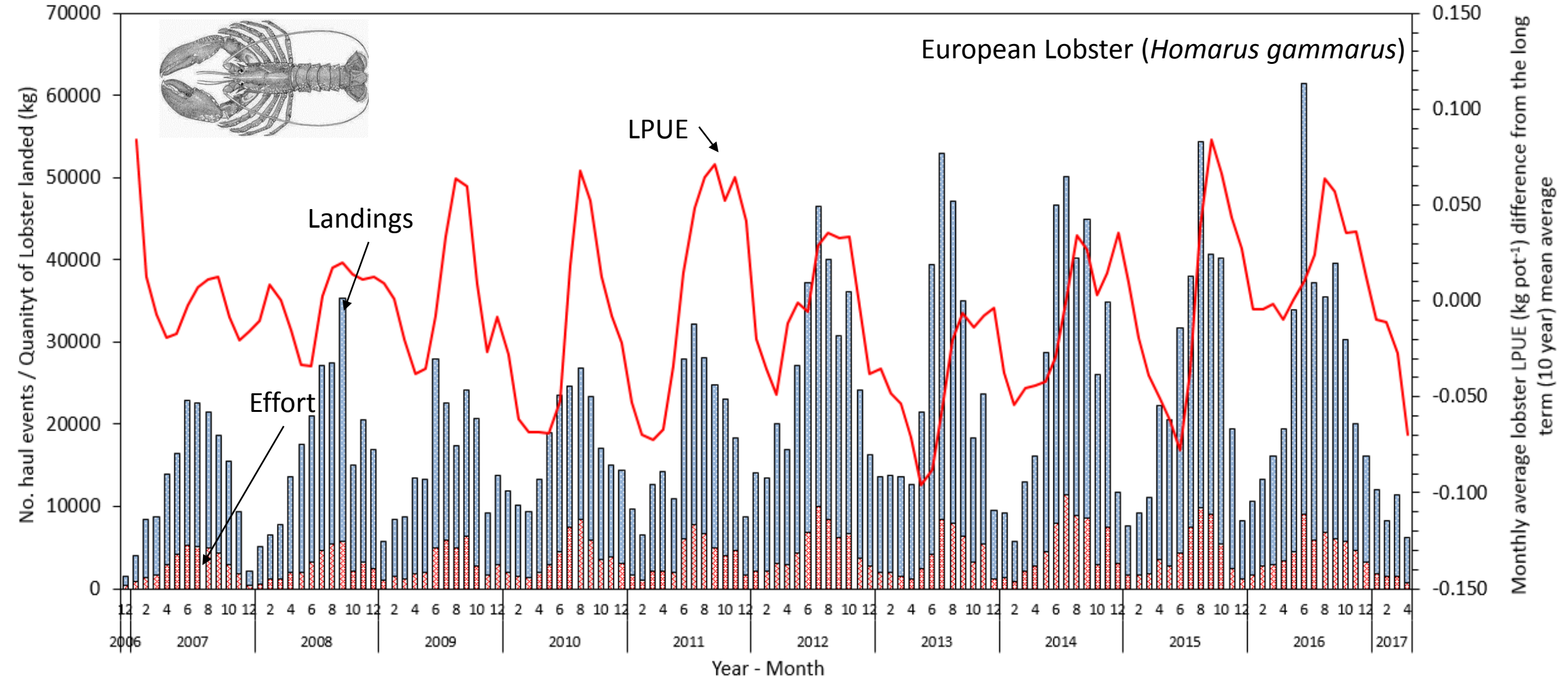
Data collection for mobile sectors



Isle of Man: Available fisheries data (static-gear)



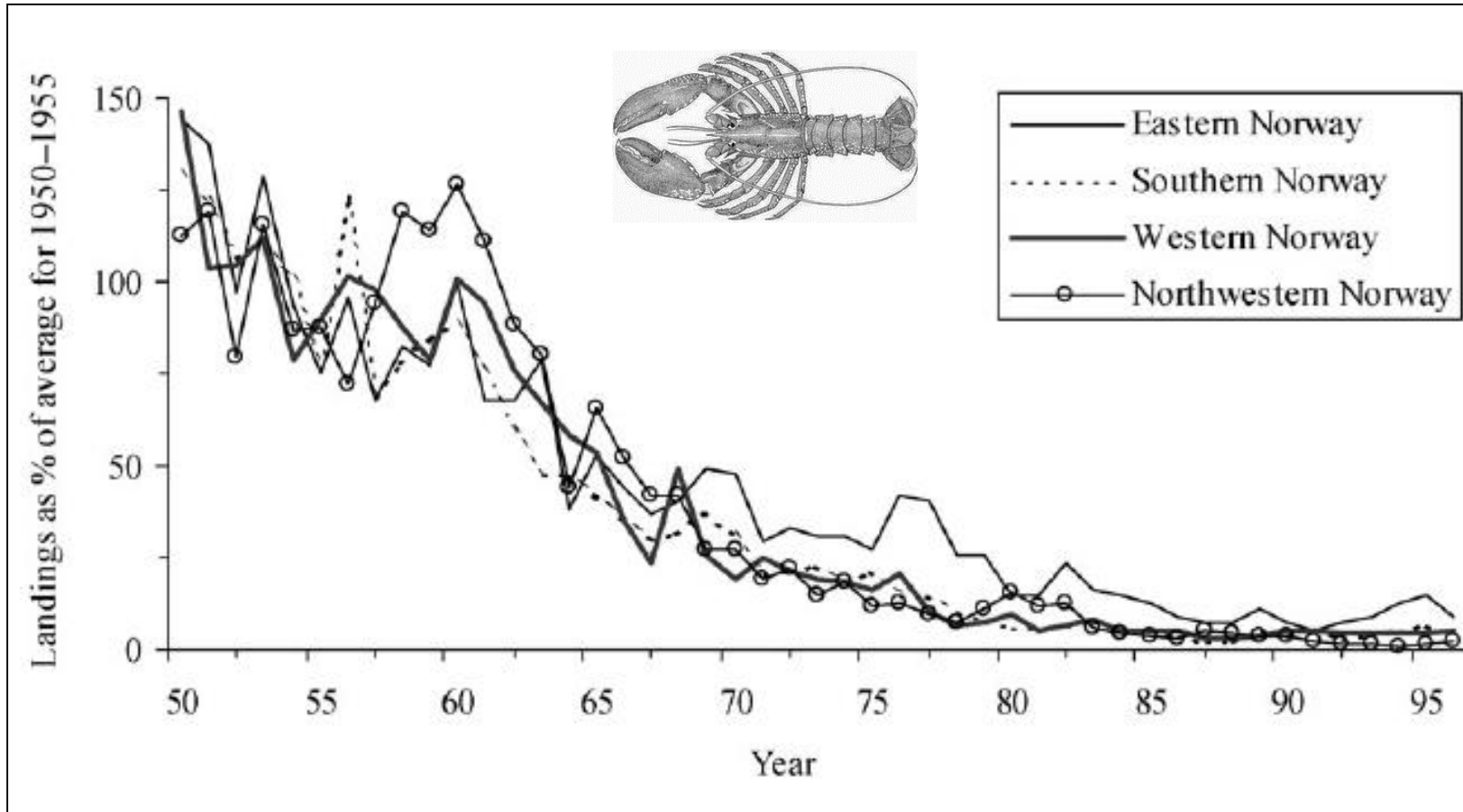
Isle of Man: Available fisheries data (static-gear)





Static-gear fisheries: The Risk

Norwegian European lobster fishery



Static-gear fisheries **CAN** collapse.

Population biology data essential.

Can't address any issues if the cause is not identified.

Norway provides unfortunate example

Norway now invested heavily in hatcheries & restocking programmes. Management target = 1 lobster per 10 hauls!

EVIDENCE-BASED FISHERIES MANAGEMENT



Static-gear fisheries: The Challenge

How to improve monitoring & analysis, when...

- Mostly inshore fleets
- Small boats (not research vessels)
- Limited resources (public spending)
- Increasing data-requirements across all fisheries.



Without increasing the burden of complex paperwork on the fishing industry.

Static-gear fisheries: On-board cameras

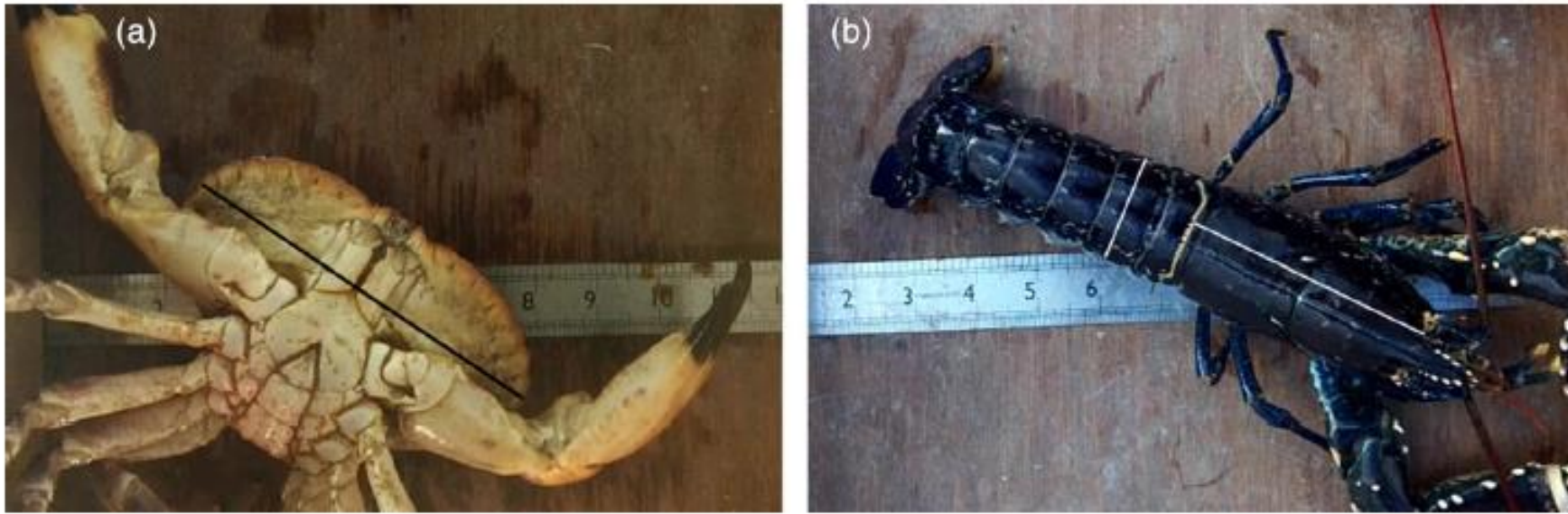
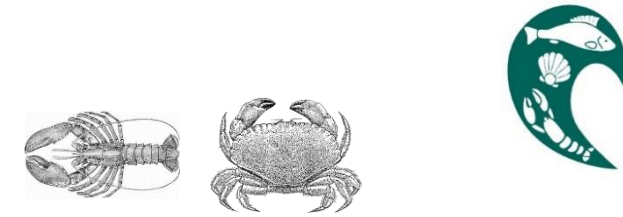


Figure 3. Two examples of images extracted from videos of animals being passed under the on-board camera. (a) Ventral view of a crab (*Cancer pagurus*) and (b) dorsal view of a lobster (*Homarus gammarus*).

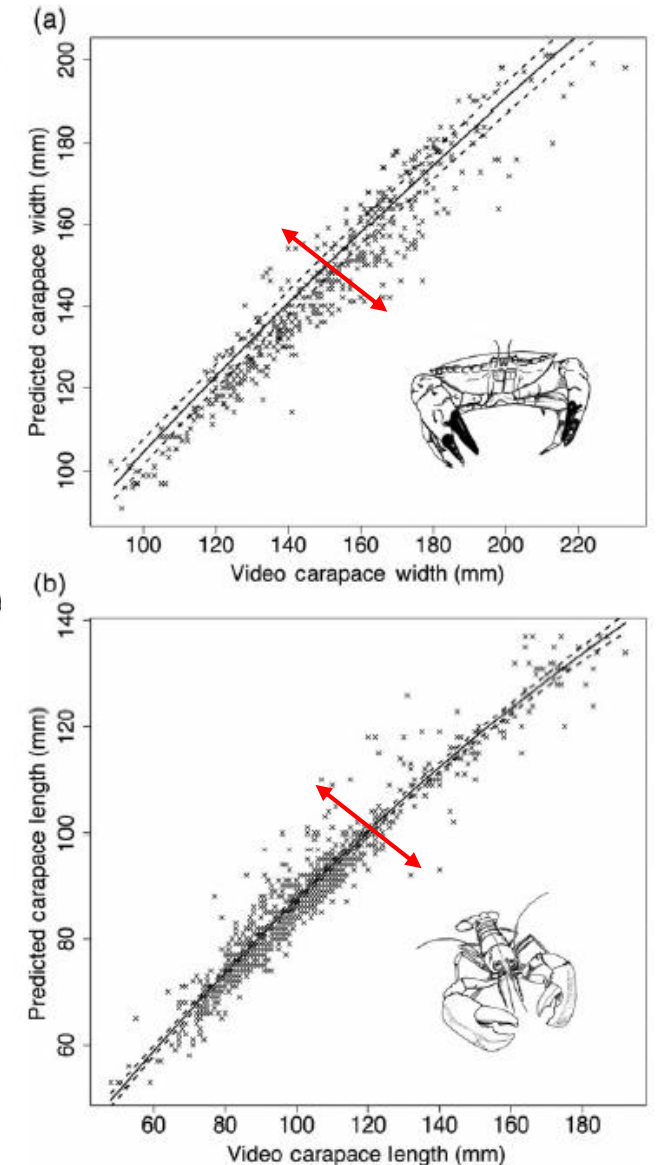
Natalie Hold*, Lee G. Murray, Julia R. Pantin, Jodie A. Haig, and Michel J. Kaiser

School of Ocean Sciences, Bangor University, Askew Street, Menai Bridge LL59 5AB, UK

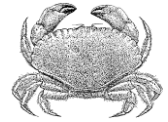
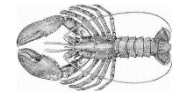
*Corresponding author: tel: +44 1248 382850; fax: +44 1248 716367; e-mail: n.hold@bangor.ac.uk

Hold, N., Murray, L. G., Pantin, J. R., Haig, J. A., and Kaiser, M. J. Video capture of crustacean fisheries data as an alternative to on-board observers. – ICES Journal of Marine Science, doi: 10.1093/icesjms/fsv030.

Received 11 November 2014; revised 29 January 2015; accepted 5 February 2015.



Static-gear fisheries: On-board cameras

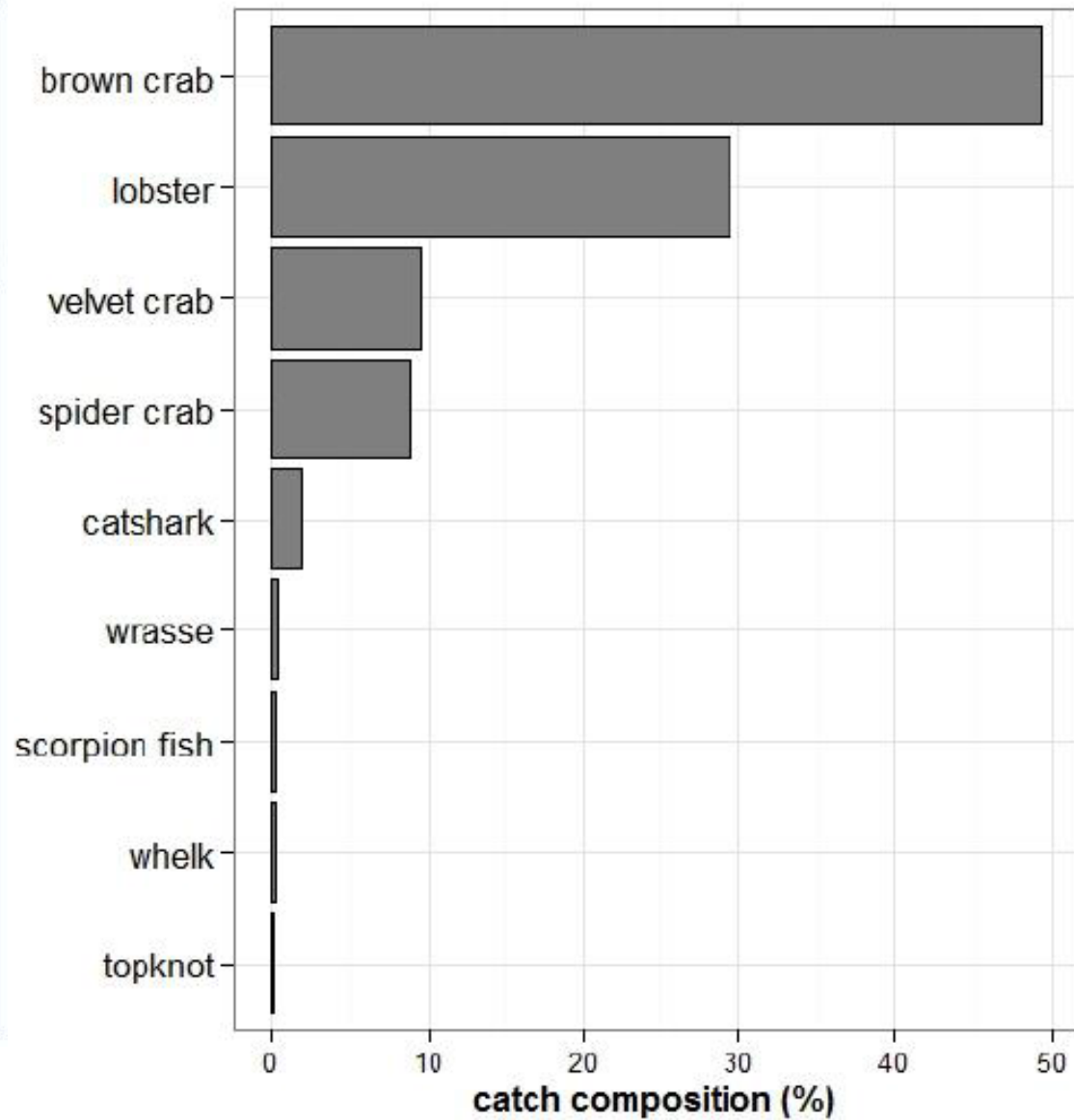
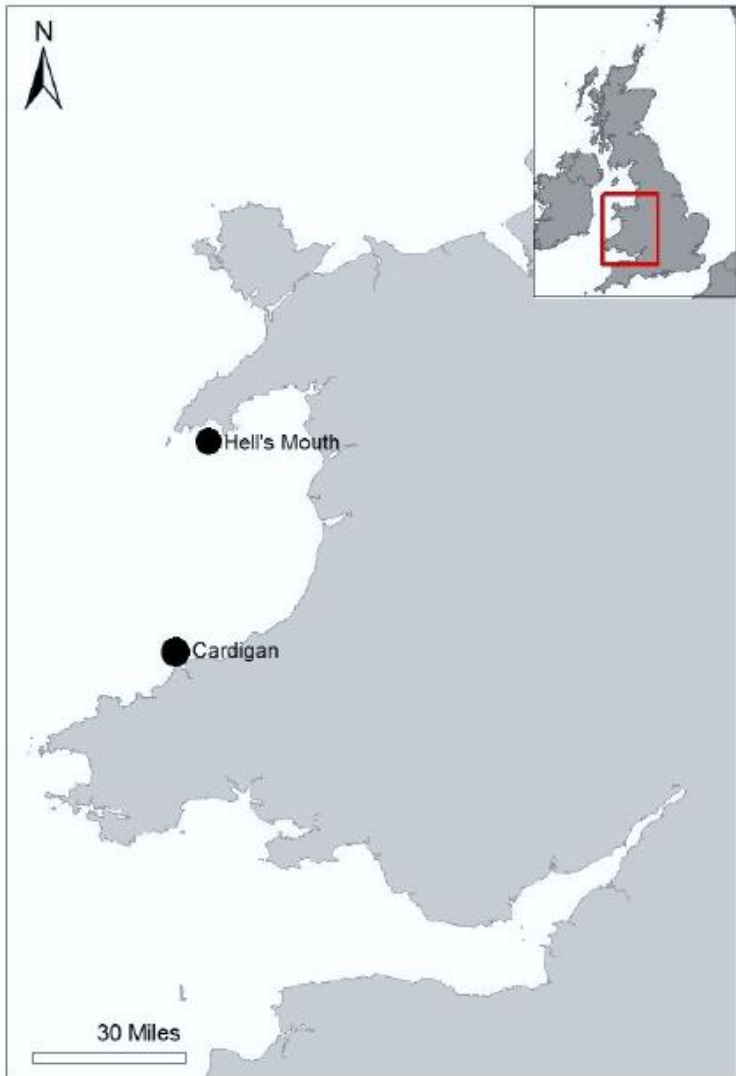
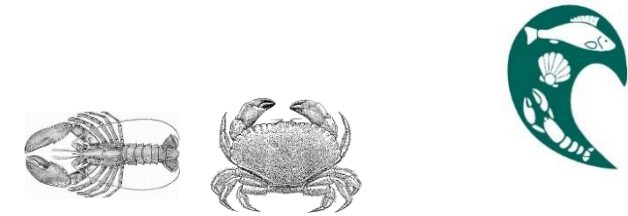


VIDEO

Cambie, G. et al. (2016) Fisheries & Conservation Science Group report No 63, Bangor University. Pp. 15

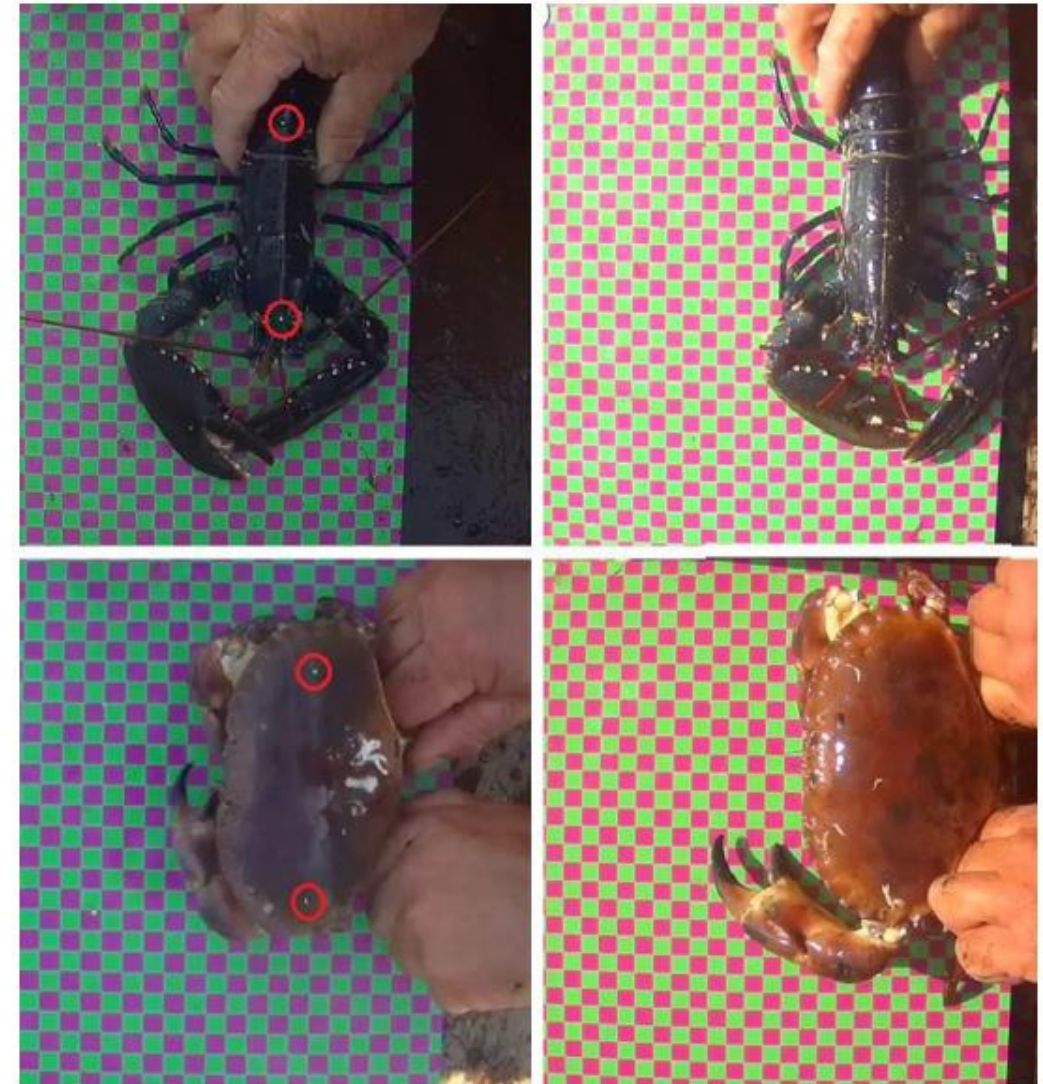
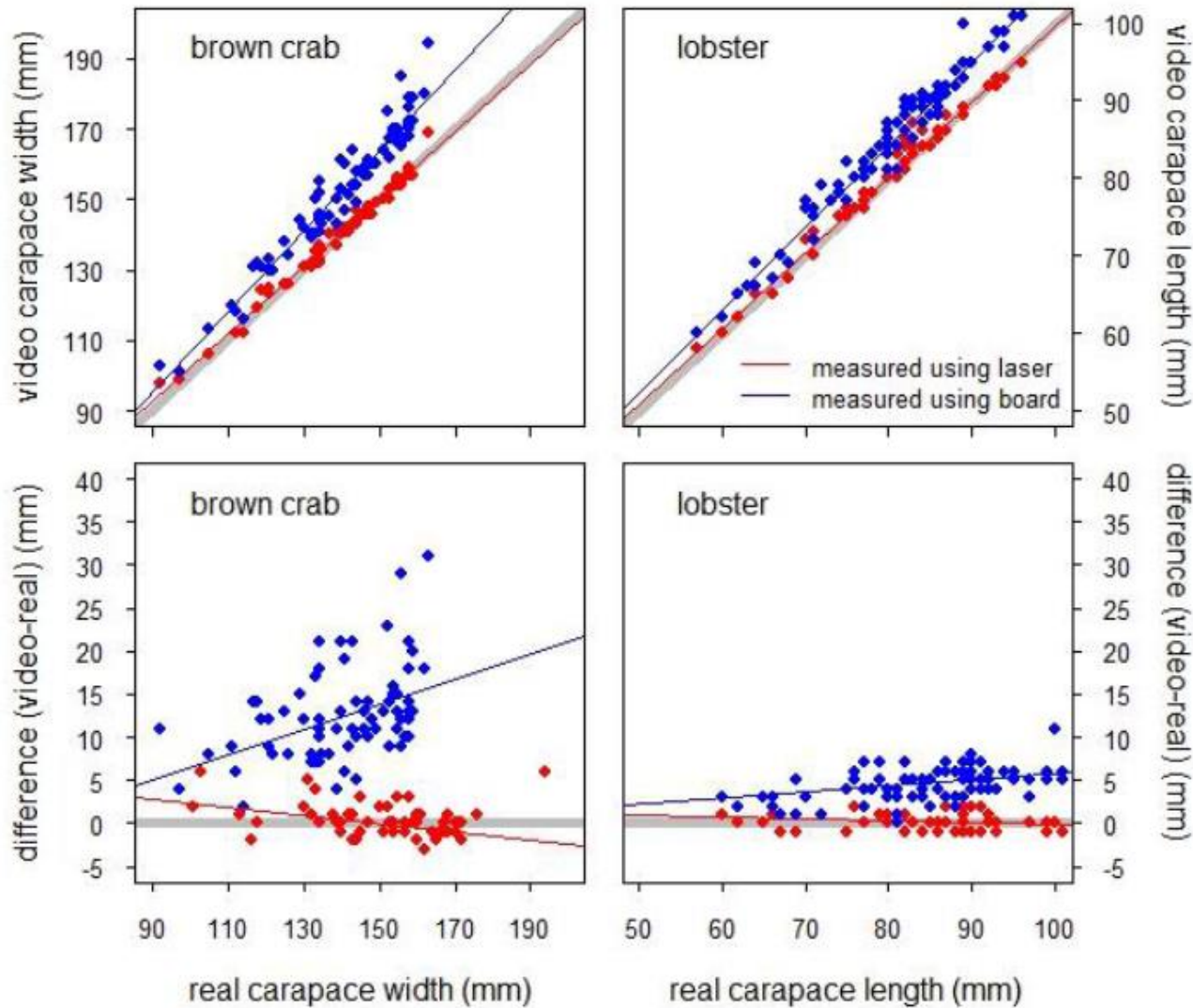
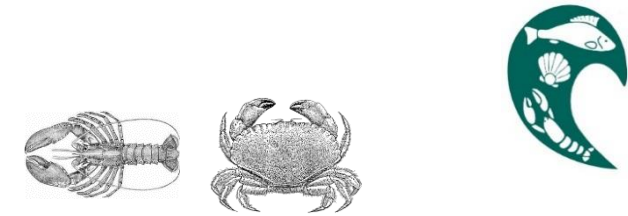
Cardigan Bay, June 2016.

Static-gear fisheries: On-board cameras

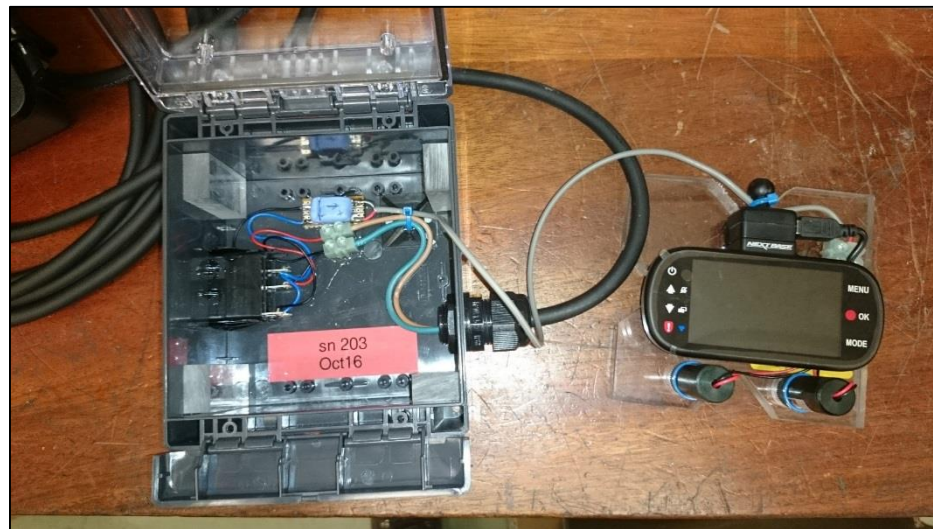
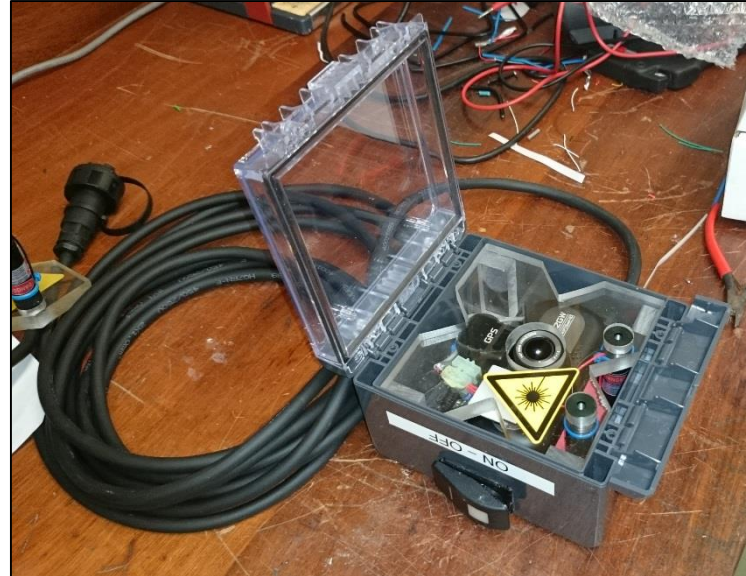
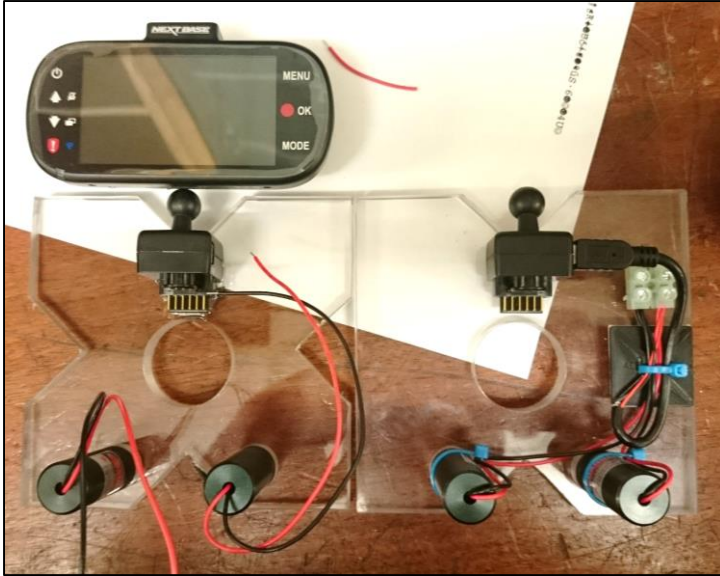
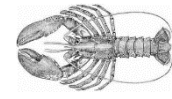


Cambie et al (2016)

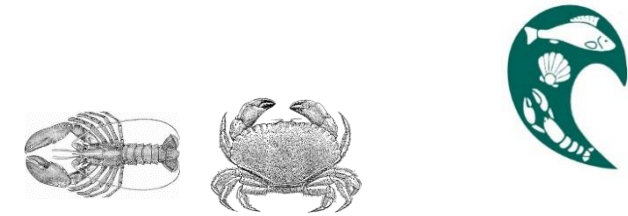
Static-gear fisheries: On-board cameras



Static-gear fisheries: On-board cameras



Static-gear fisheries: On-board cameras

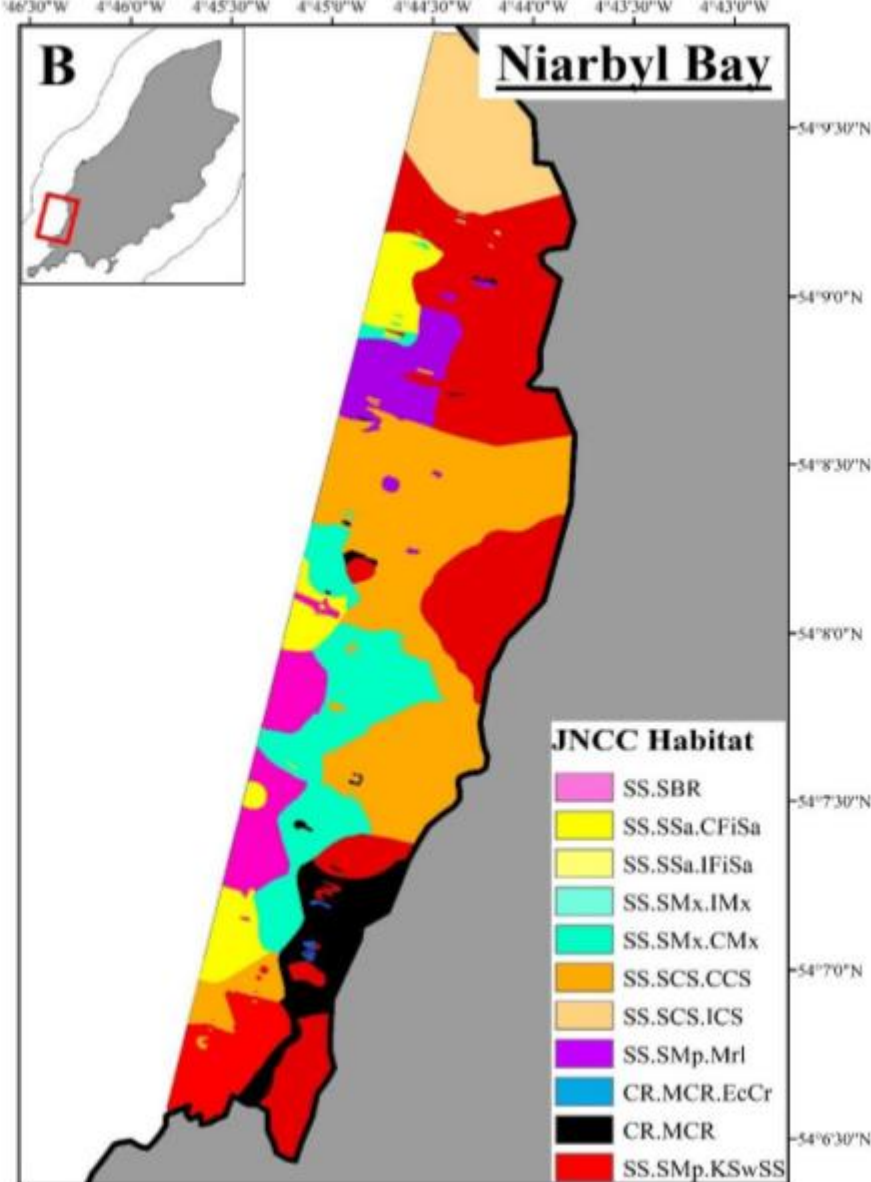
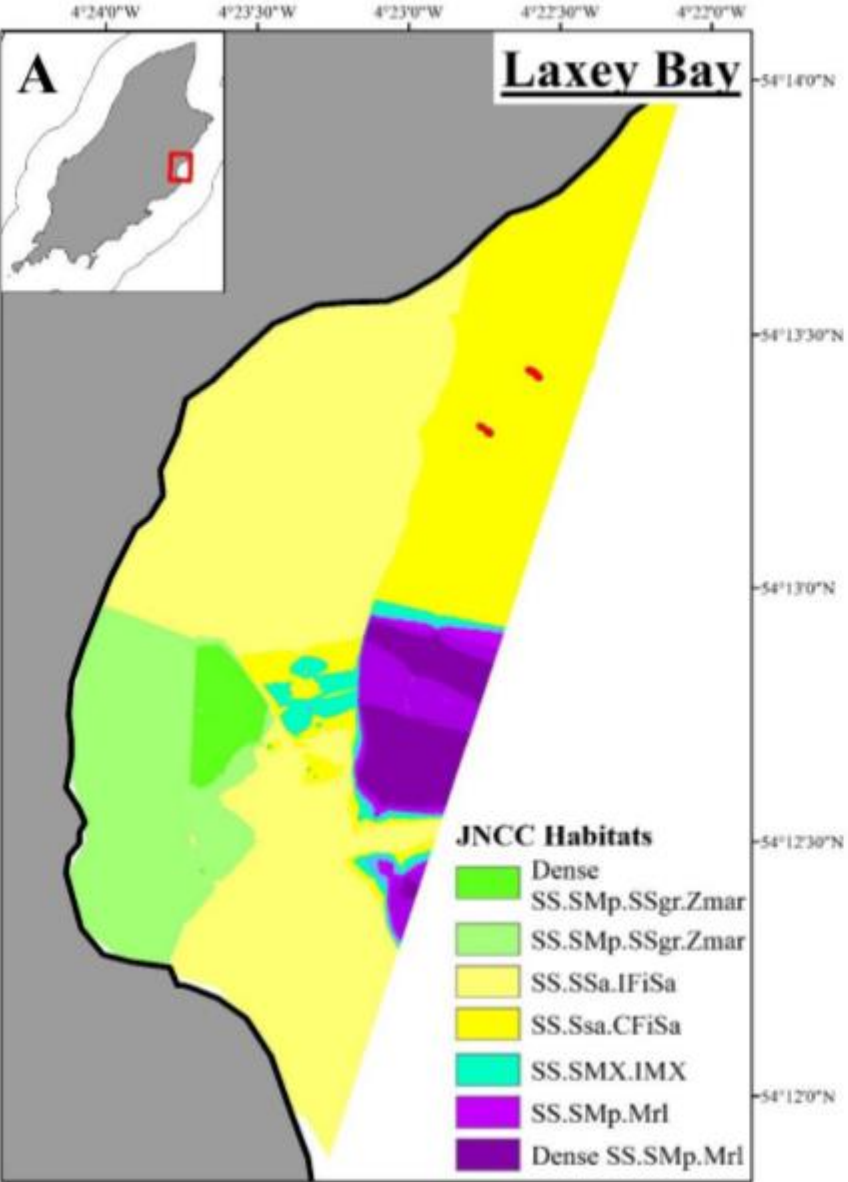
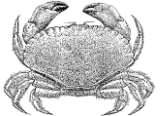
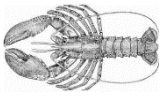


NBDVR412GW

PL16

Industry trials on-board FV Maverick PL165, March 2017.
Northwest Isle of Man

Static-gear fisheries: On-board cameras

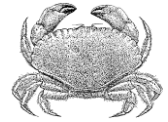
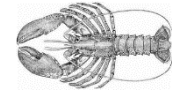


R Biotope

MSc project 2017:

- Further validation
- Variation around the island
- Catch composition
- Habitat links
- Discarding and bycatch

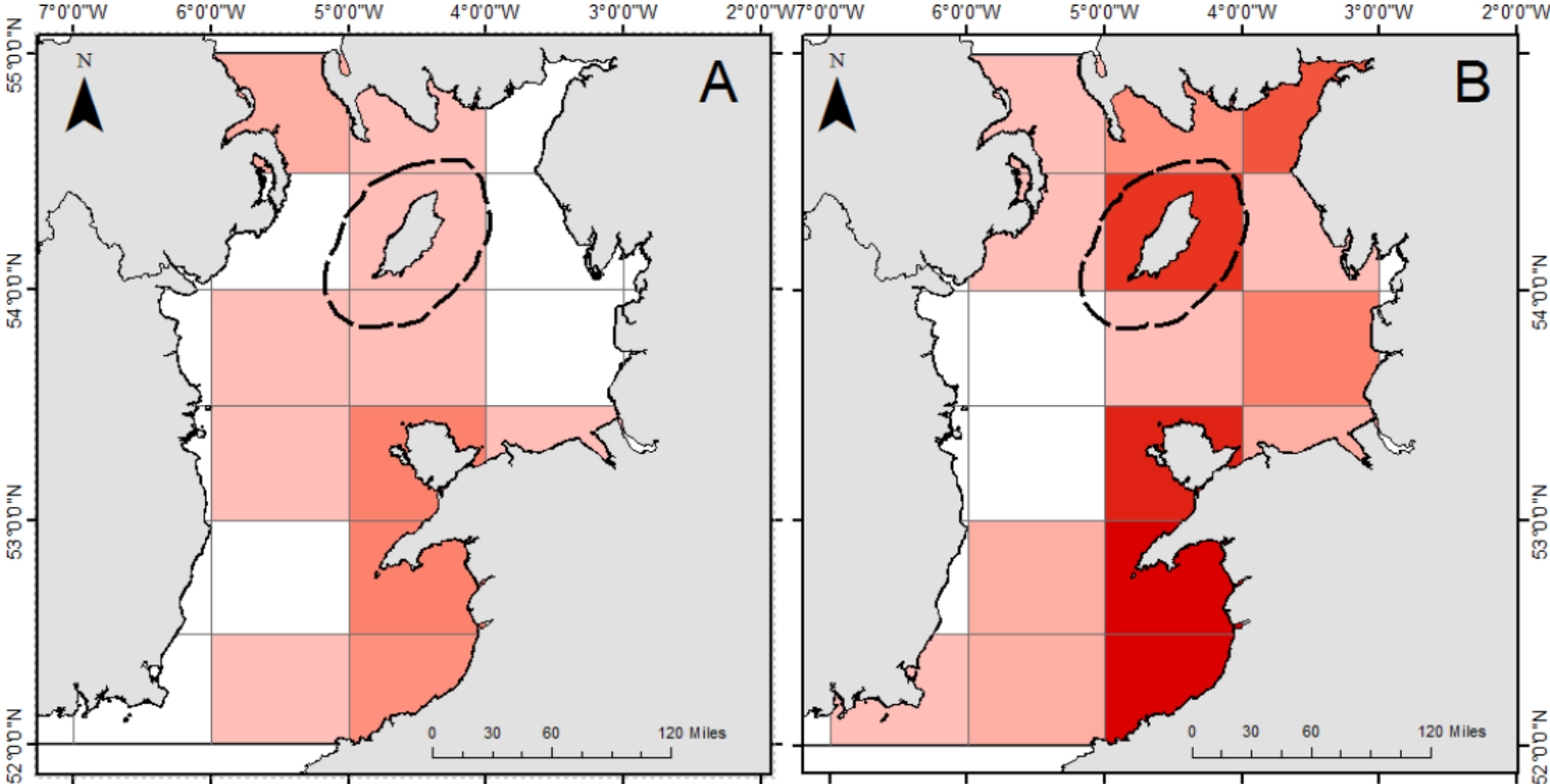
Static-gear fisheries: On-board cameras



SUMMARY

- Unit cost £400
- Could be used for both at sea & ashore (market) sampling.
- Useful tool for evidence gathering, fishery assessment (& EU Landings Obligation)
- Summer 2017, MSc student Sian Morgan to investigate uses & limitations from Manx trials.
- Auto-recognition solution being developed.
- ICES Working Group 'CRAB' development (sampling standardisation)

Static-gear fisheries: Whelk



Legend

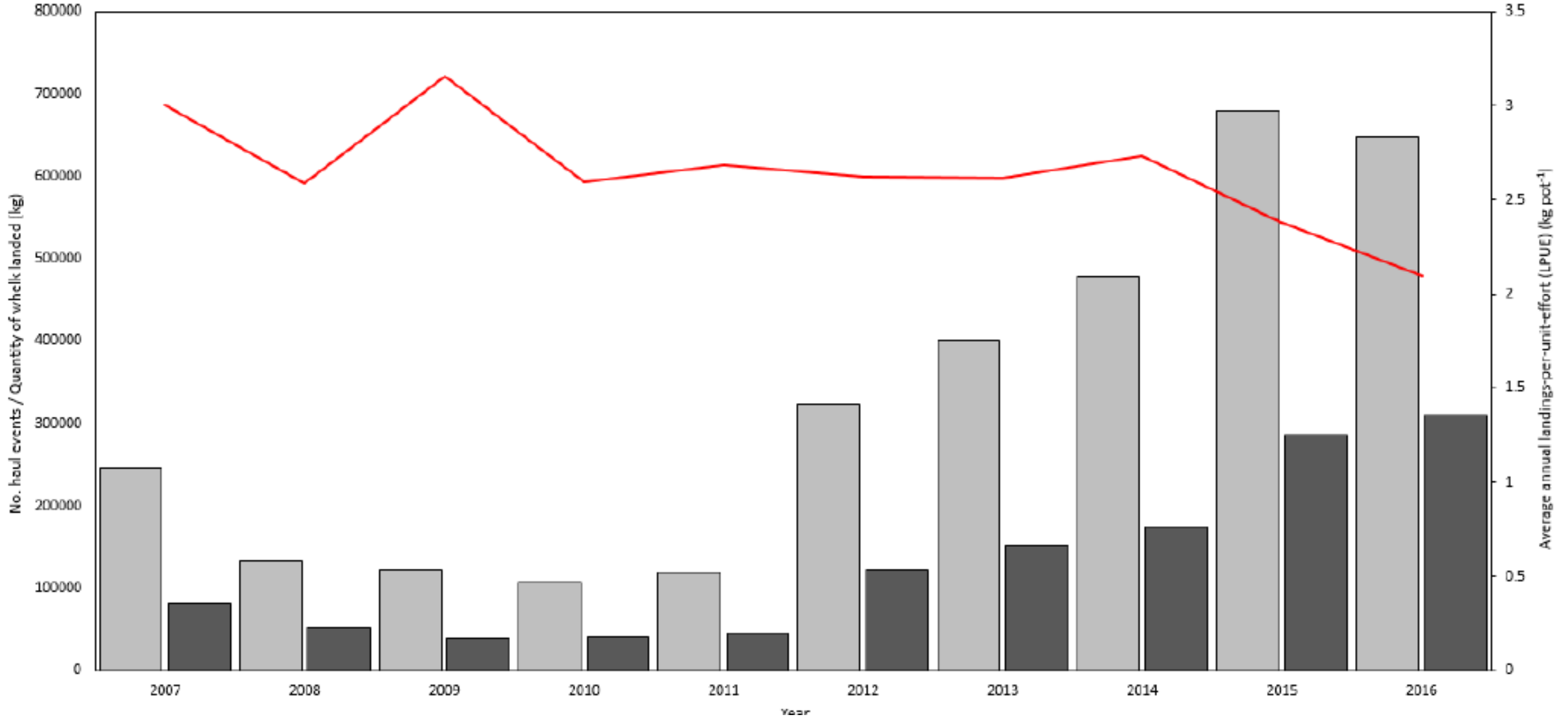
- Isle of Man Territorial Limit (12 NM)
- UK, Ireland & Isle of Man
- ICES Rectangles

Landed Weight (*Buccinum undatum*) tonnes

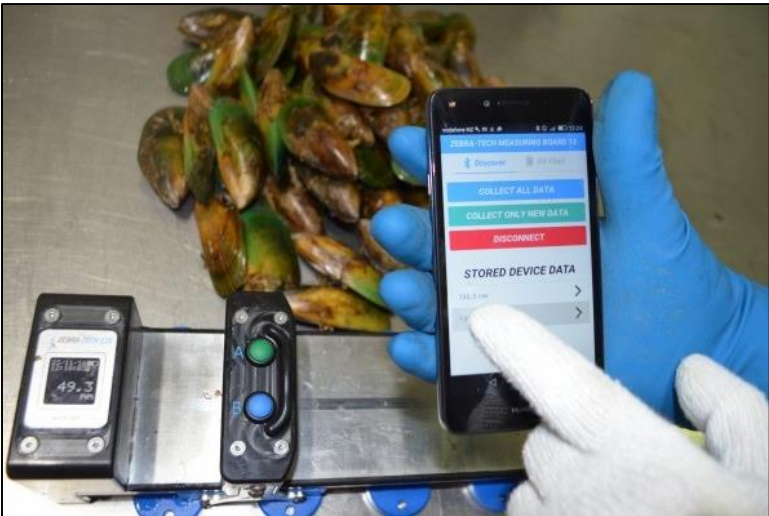
0	300-400 t	700-800 t
> 100 t	400-500 t	800-900 t
100-200 t	500-600 t	900-1000 t
200-300 t	600-700 t	1000-11000 t
		> 11000 t



Static-gear fisheries: Whelk



Static-gear fisheries: Whelk





THANK YOU

j.emmerson@bangor.ac.uk



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