

Devon & Severn IFCA



Management for sustainable fisheries in D&S IFCA District Science & Collaboration

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(Environment)

Managing the Whelk Fishery

**Determination of the Size of
Maturity of the Whelk**

*Collaboration with the fishing
industry*



Whelk fishery

- Fishing effort for whelk shown rapid increase over the last decade
- UK landings doubled between 2002 and 2012
 - In 2002 8,687 tonnes landed worth £4 million
 - In 2012 16,000 tonnes landed worth £10.8 million
- Often seen as 'Boom and Bust' fishery
- Concern by industry members of impact of increased pressure on stocks and sustainability of fishery



D&S IFCA Whelk fishery

- Main Devon landing ports are Ilfracombe, Exmouth and Brixham, although whelking occurs along the coast with smaller landings into other ports
- 2016 figures show landings and values:

Port	Landing tonnes	Value £000	
Appledore	9.13	10.96	North Devon
Bideford	60.74	73.94	
Ilfracombe	533.40	640.88	
Axmouth	22.66	24.47	South Devon
Beer	1.12	0.99	
Brixham	508.39	546.39	
Dartmouth	38.13	38.84	
Exmouth	302.22	328.08	
Kingswear	35.04	34.96	
Plymouth	0.31	0.34	
Teignmouth	89.49	89.15	

D&S IFCA Whelk fishery

- For Ilfracombe and Exmouth the landings for 2012-2016 can be seen below:

	Ilfracombe		Exmouth	
	tonnes	Value £	tonnes	Value £
2012	661	479,000	241.8	170,599
2013	538	399,744	401	300,646
2014	716	564,646	301	238,605
2015	874	818,401	315	282,674
2016	533	640,877	302	328,080

Current Management

- No quota
- No closed season
- EU Minimum Conservation Reference Size (MCRS)
= 45mm shell height
- D&S IFCA Potting Permit Byelaw
- Lyme Bay Reserve Voluntary Code
 - 500 pots max
 - 30 pots per string max



Cefas Research

- In order to investigate if this MCRS is sufficient to protect some of the spawning population Cefas carried out a study to give estimates of Size of Maturity (SOM) at main ports in England
- The size of maturity (SOM) is the size at which the probability of an individual being mature is 0.5, i.e. the size at which 50% of the population is sexually mature.

Location	Female SOM (mm)	Male SOM (mm)
Exmouth	72.4	69.2
Ilfracombe	75.5	75.5



D&S IFCA Research Aims

1. Build on Cefas' study to determine accurate estimates of SOM within District
2. Assess whether a Minimum Size based on shell width is viable (ease of sorting catch)
3. Identify peak breeding/spawning times

Industry Engagement

- Meetings held with whelk fishermen in North & South Devon
 - Discussed how they see the fishery
 - General support shown for introduction of some additional management
 - Potential size increase / closed season
- Two skippers volunteered to collect survey samples (Exmouth & Ilfracombe)

Methodology

- Monthly samples collected from Exmouth & Ilfracombe for a period of 12 months
- Size & sex stratified sub-samples analysed
- Width, height metric data collected



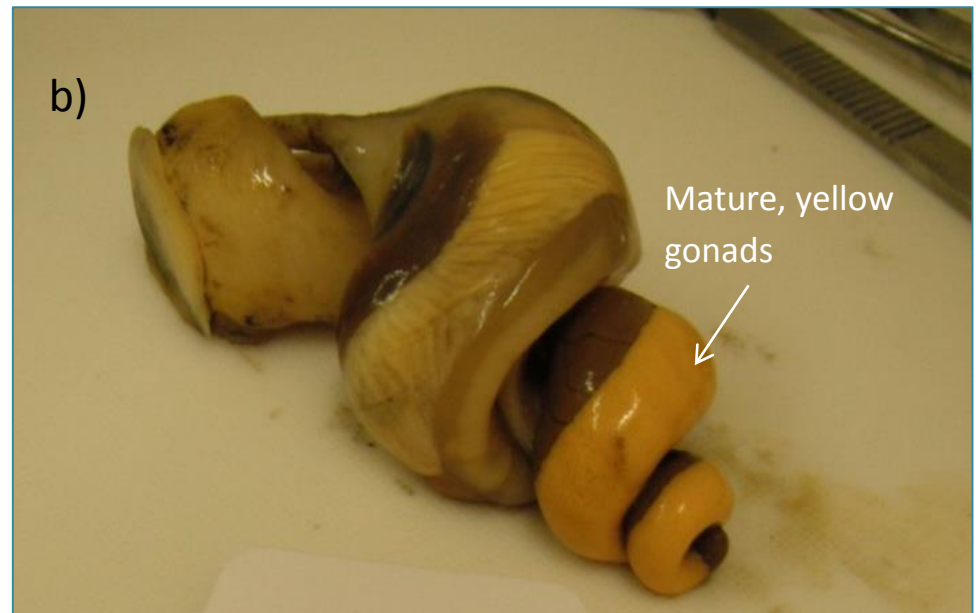
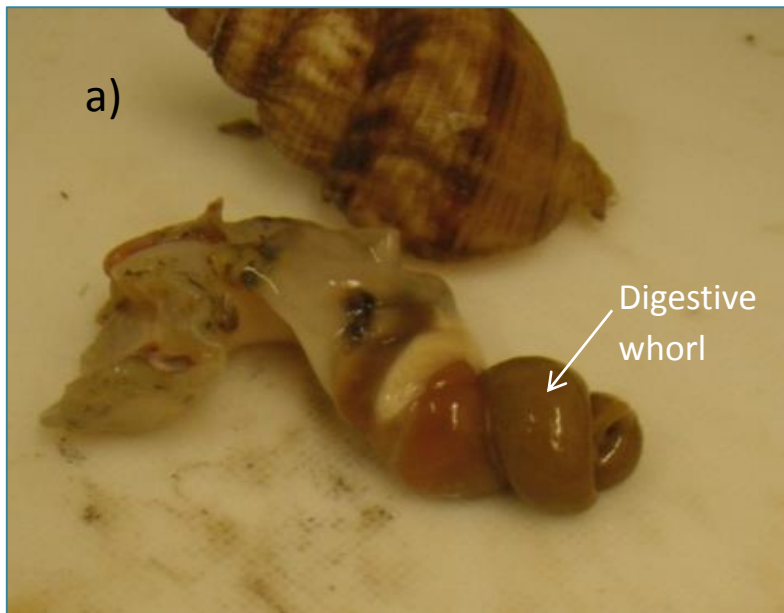
Devon & Severn



Inshore Fisheries and Conservation Authority

Methodology

- Assessing maturity stage

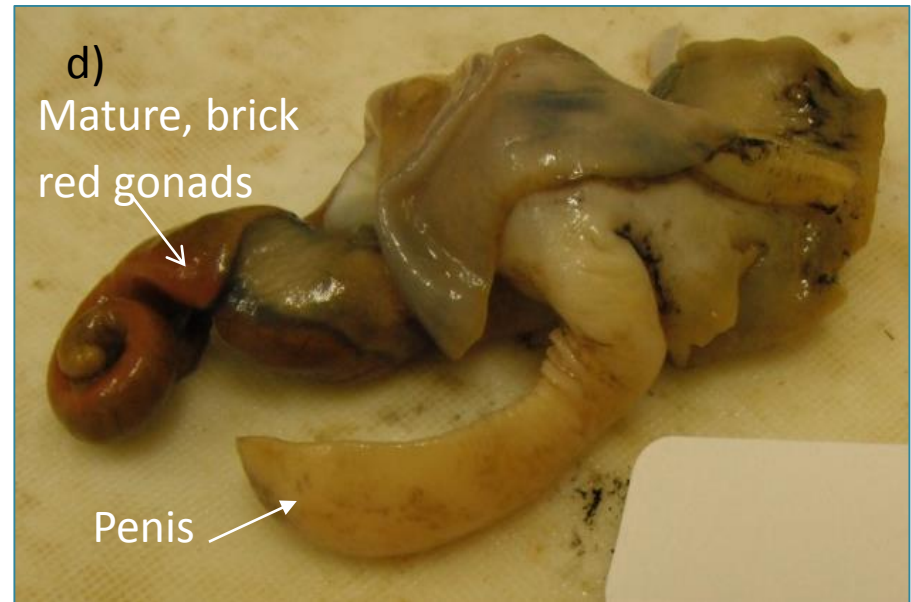
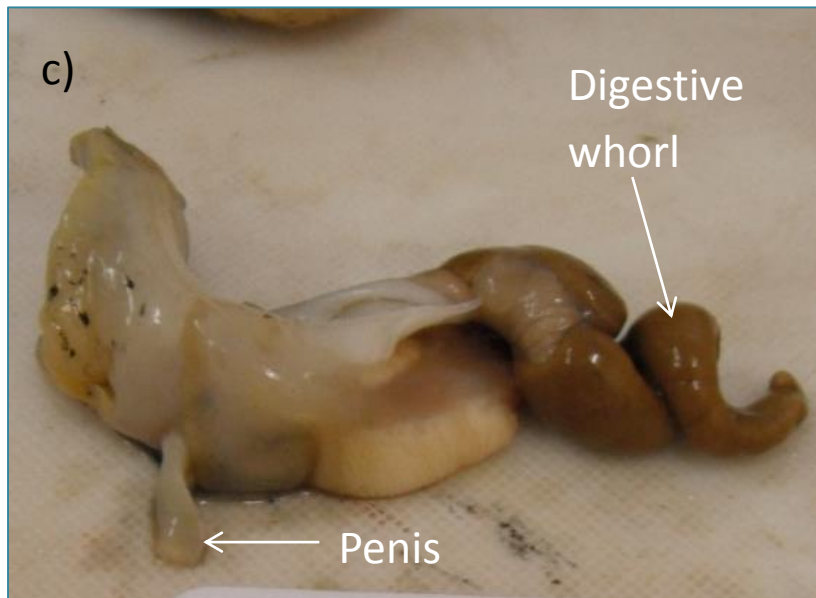


a) Immature female: no differentiation between digestive whorl and gonad.

b) Mature female: gonad clearly differentiated from digestive whorl.

Methodology

- Assessing maturity stage



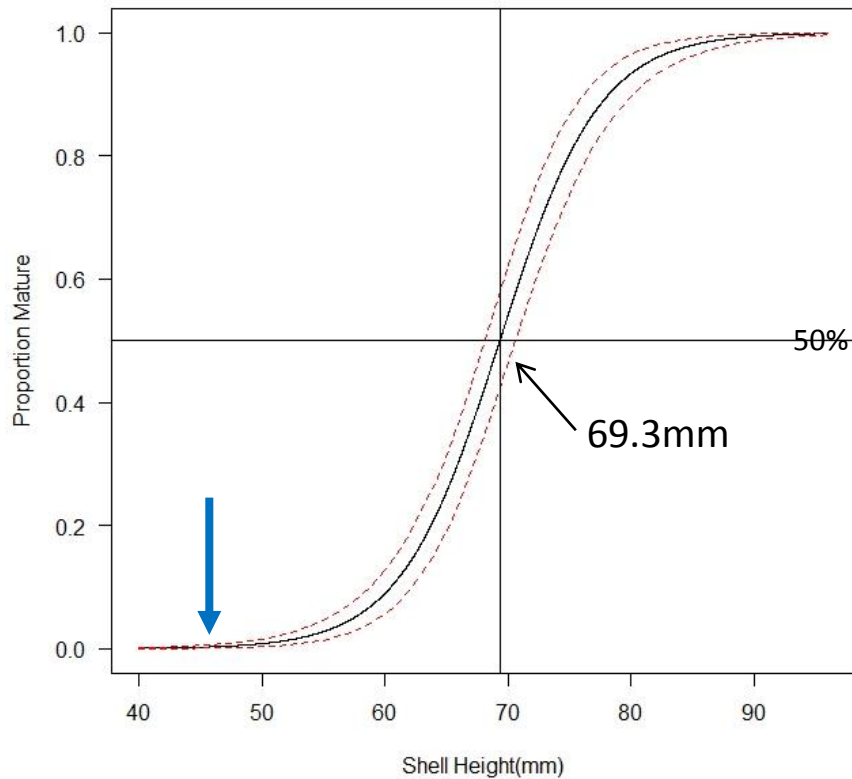
c) Immature male: no differentiation between gonad and digestive whorl, undeveloped penis.

d) Mature male: gonad differentiated from digestive whorl, penis fully developed.

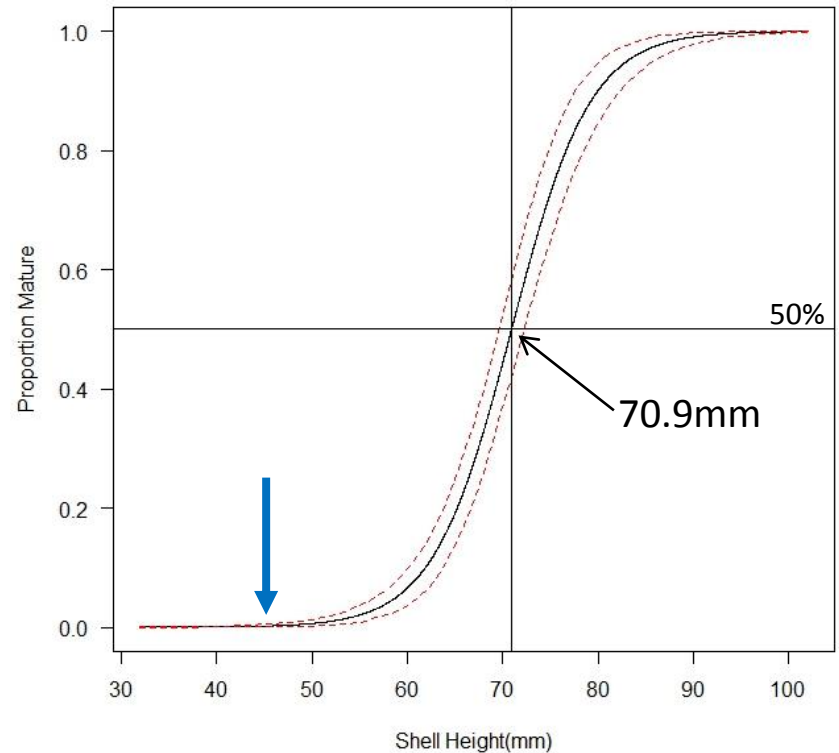
Results

Size of maturity by shell height - Exmouth:

Exmouth Females



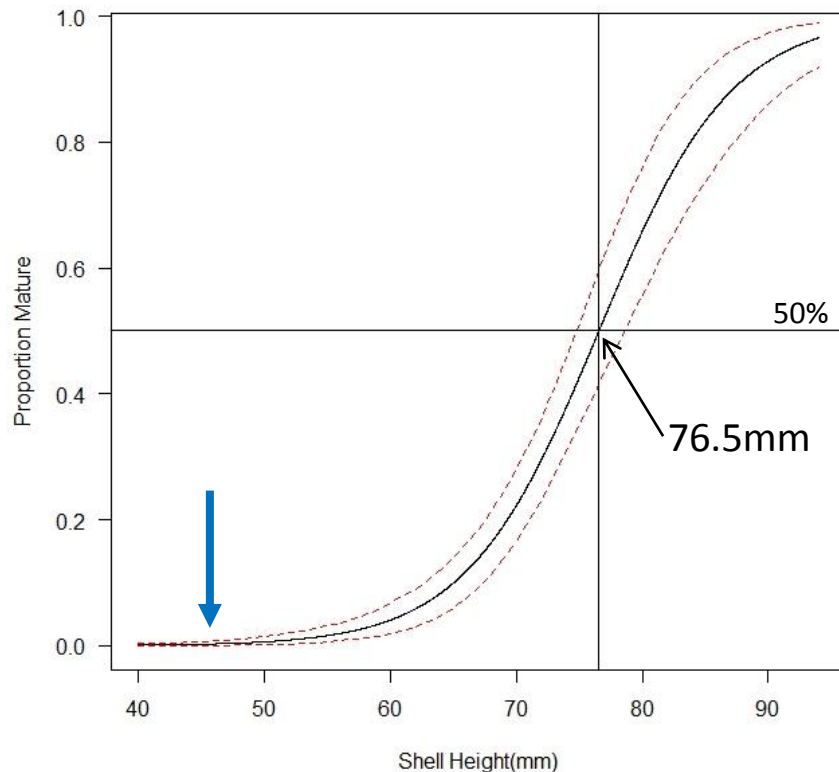
Exmouth Males



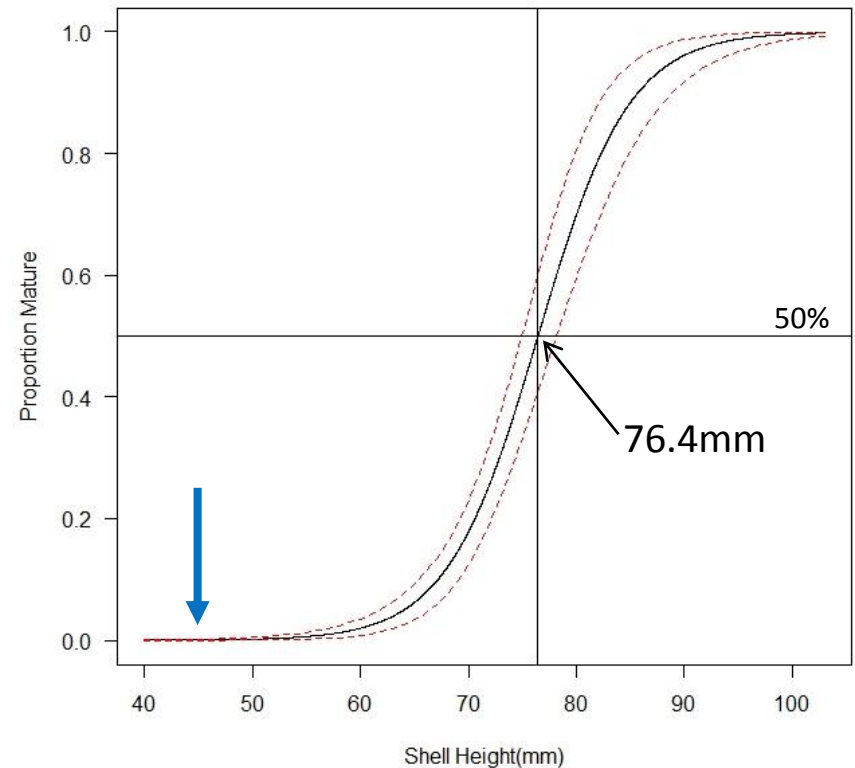
Results

Size of maturity by shell height - Ilfracombe:

Ilfracombe Females



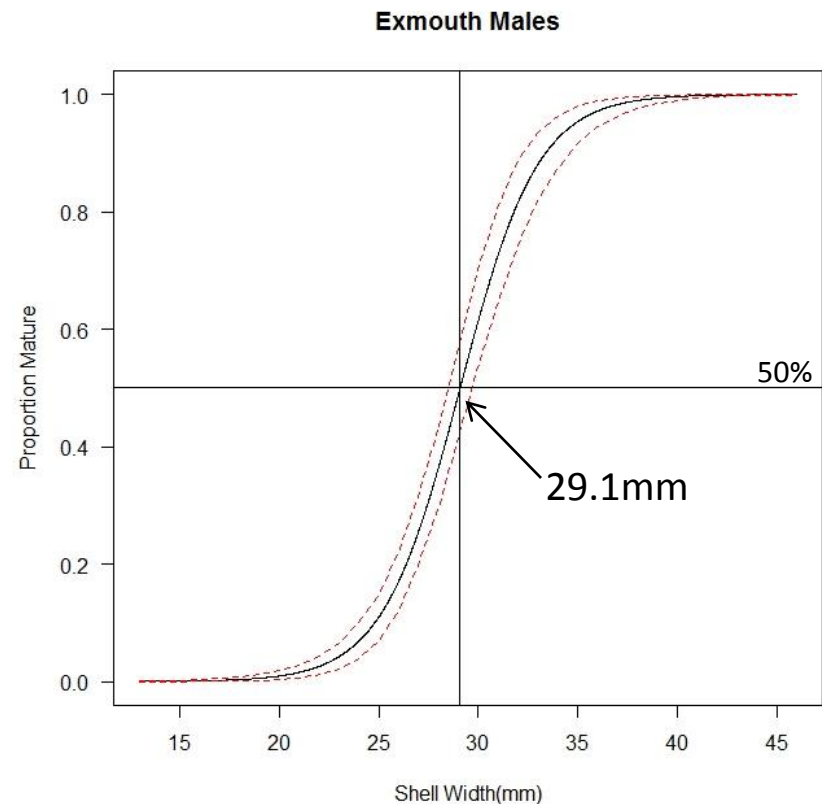
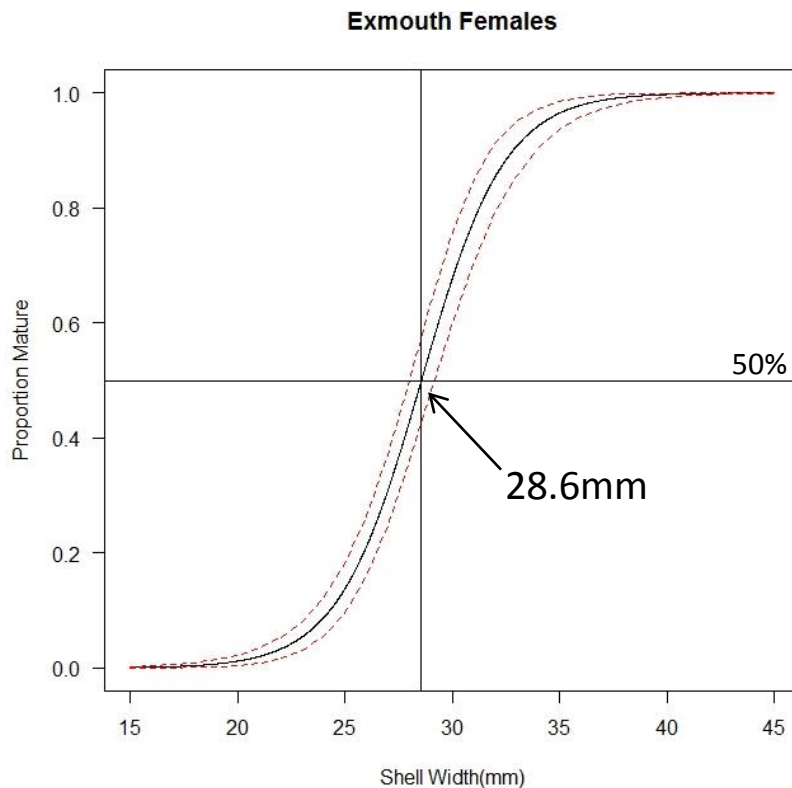
Ilfracombe Males



Results

- Strong positive correlation between shell height and shell width

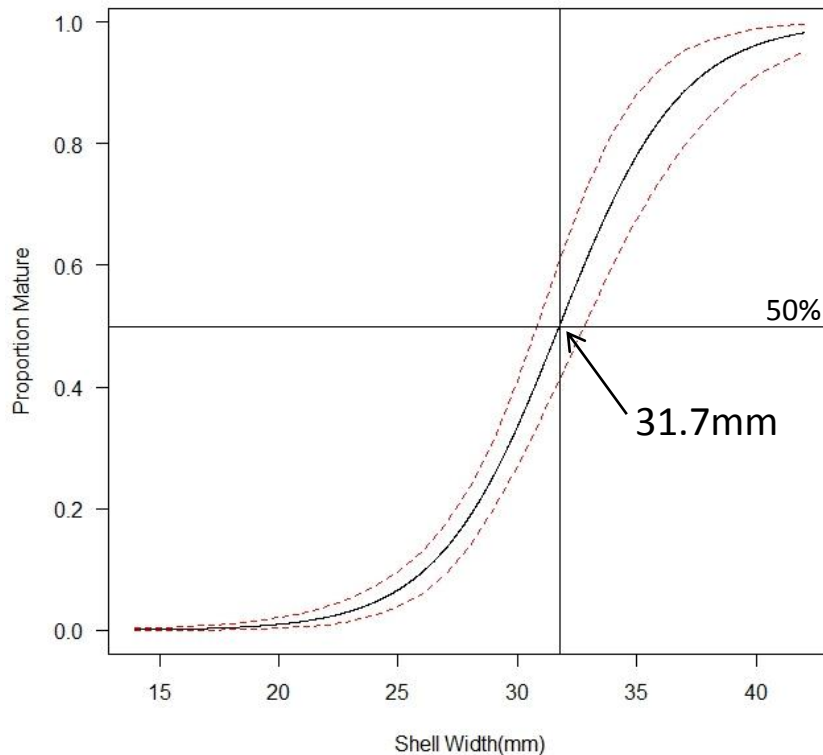
Size of maturity by shell width - Exmouth:



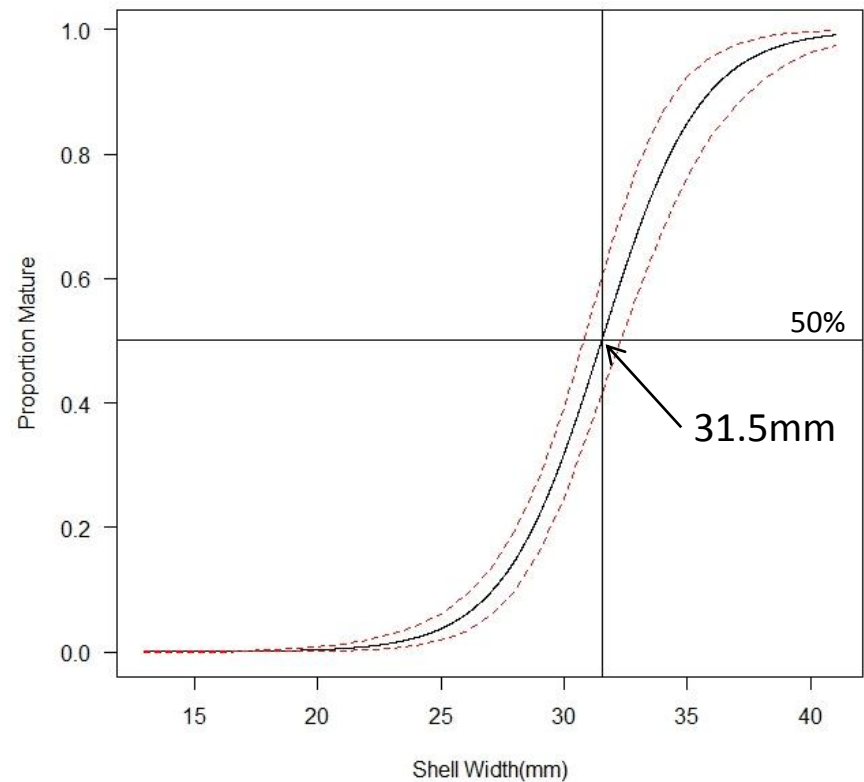
Results

Size of maturity by shell width - Ilfracombe

Ilfracombe Females

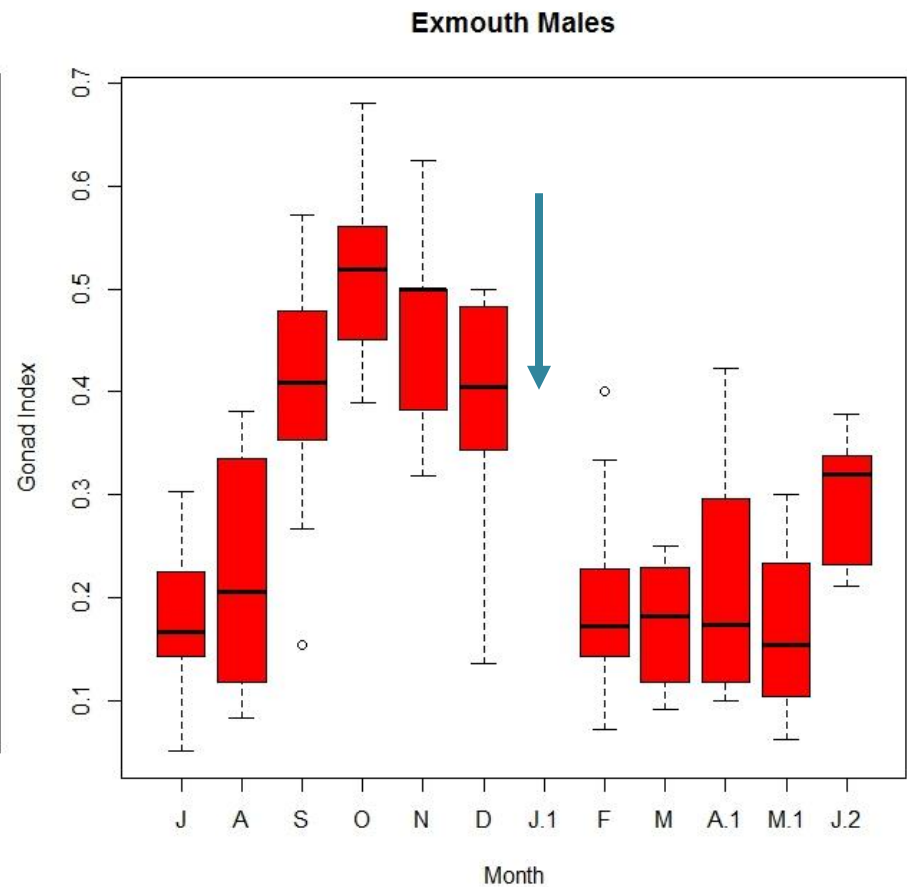
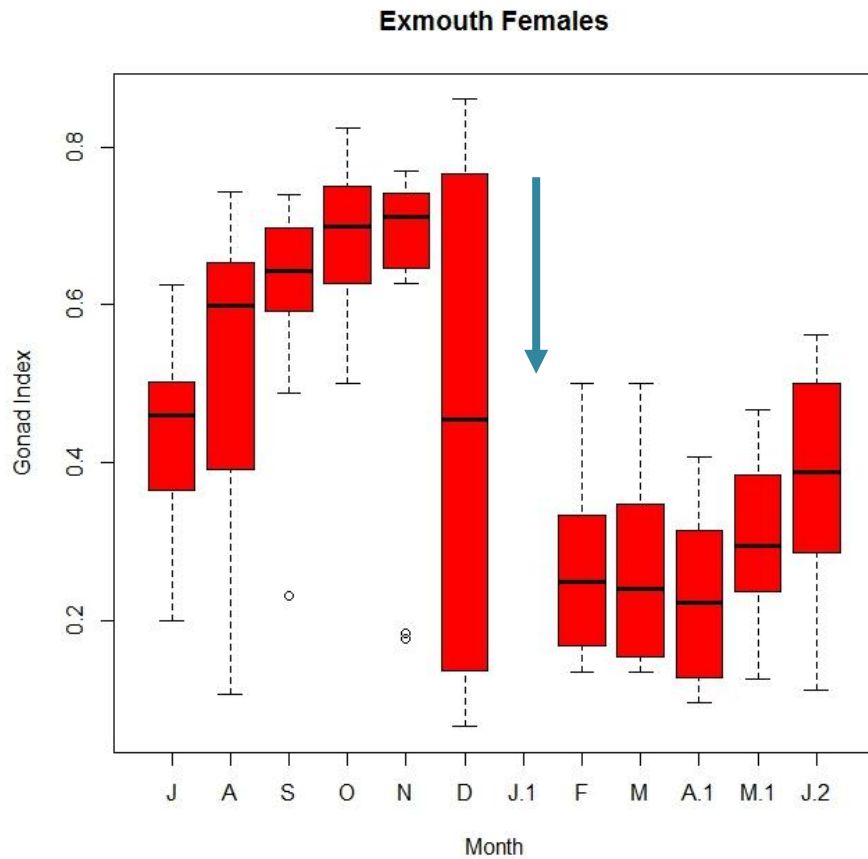


Ilfracombe Males



Results

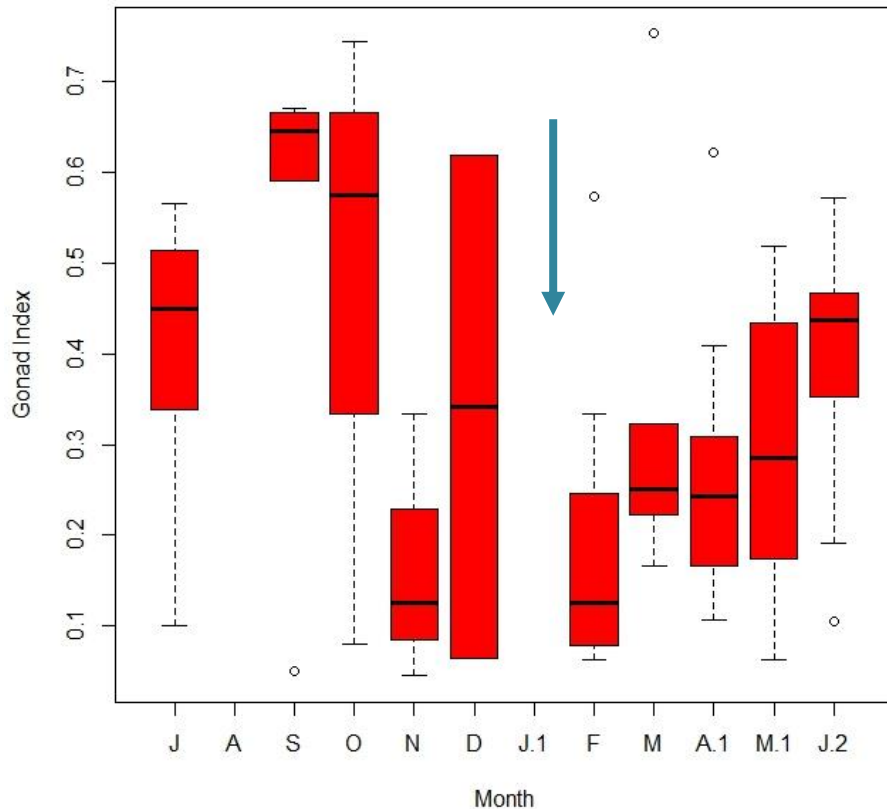
Seasonality of reproductive cycle - Exmouth



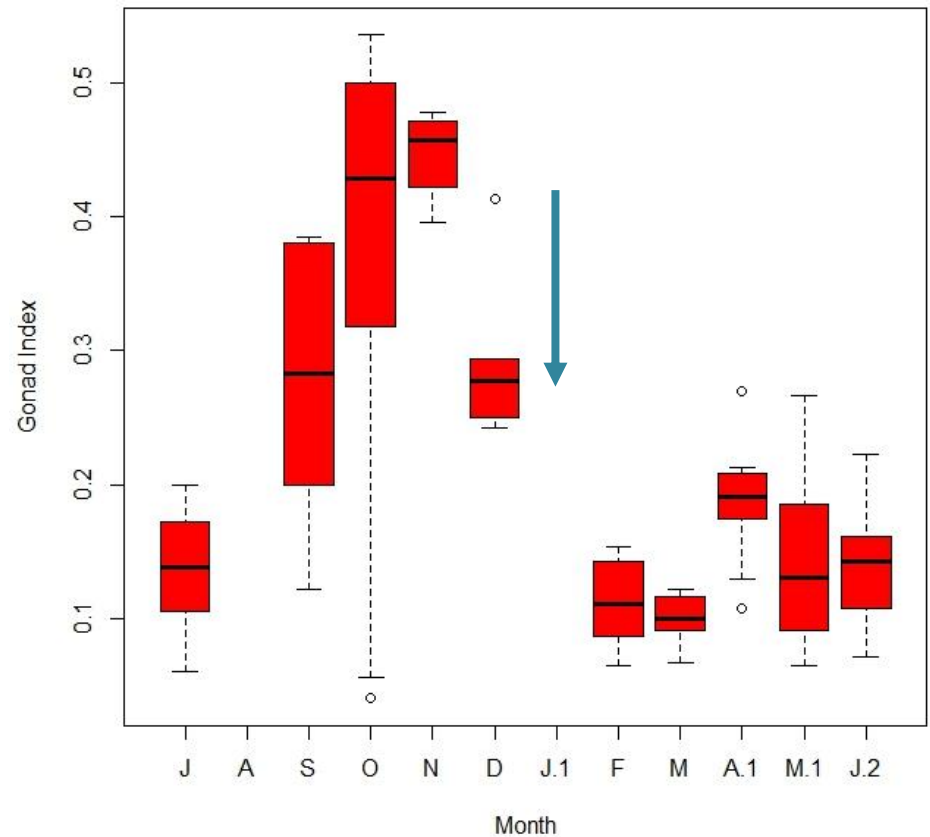
Results

Seasonality of reproductive cycle - Ilfracombe

Ilfracombe Females

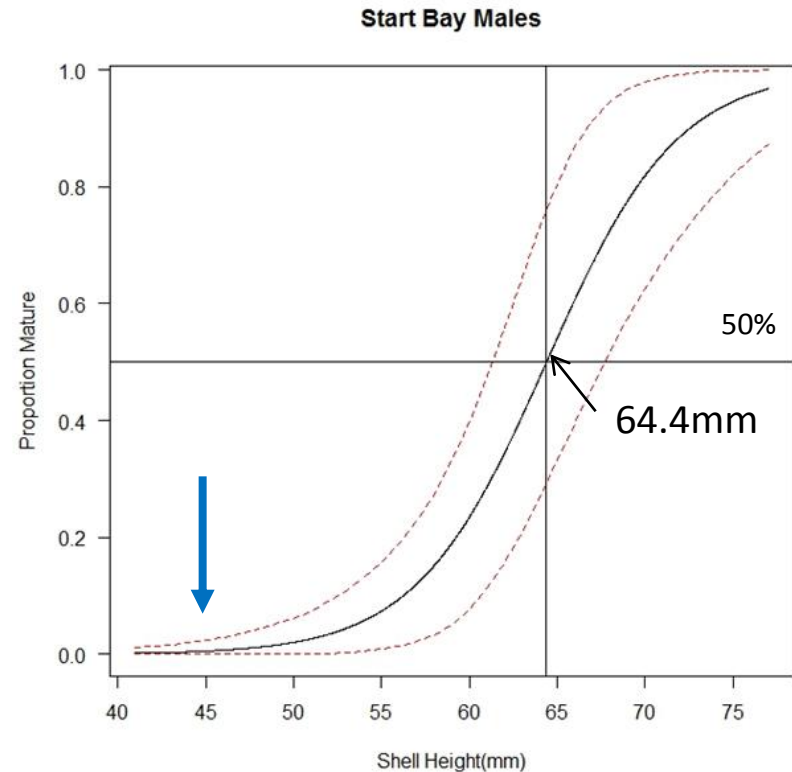
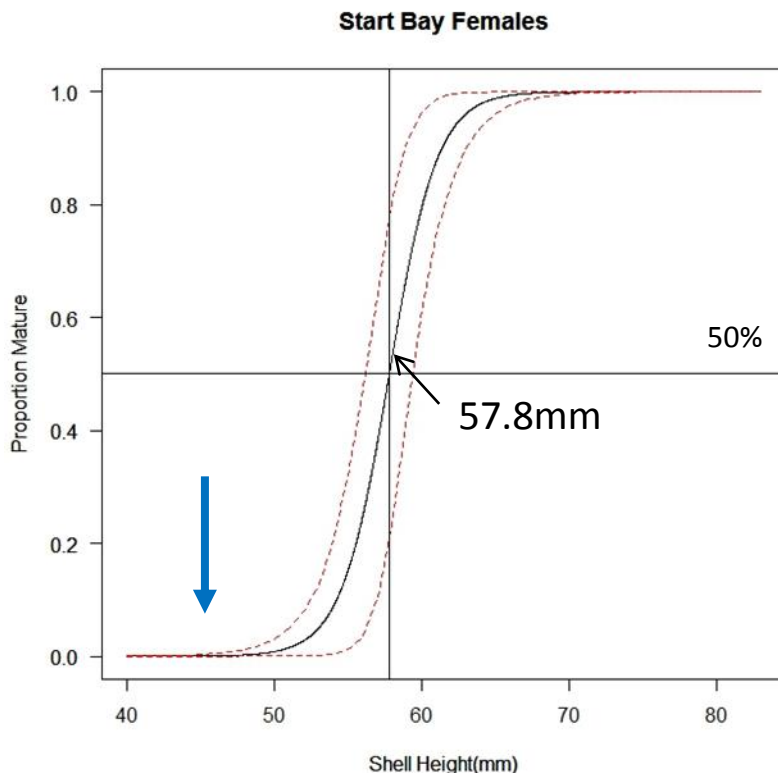


Ilfracombe Males



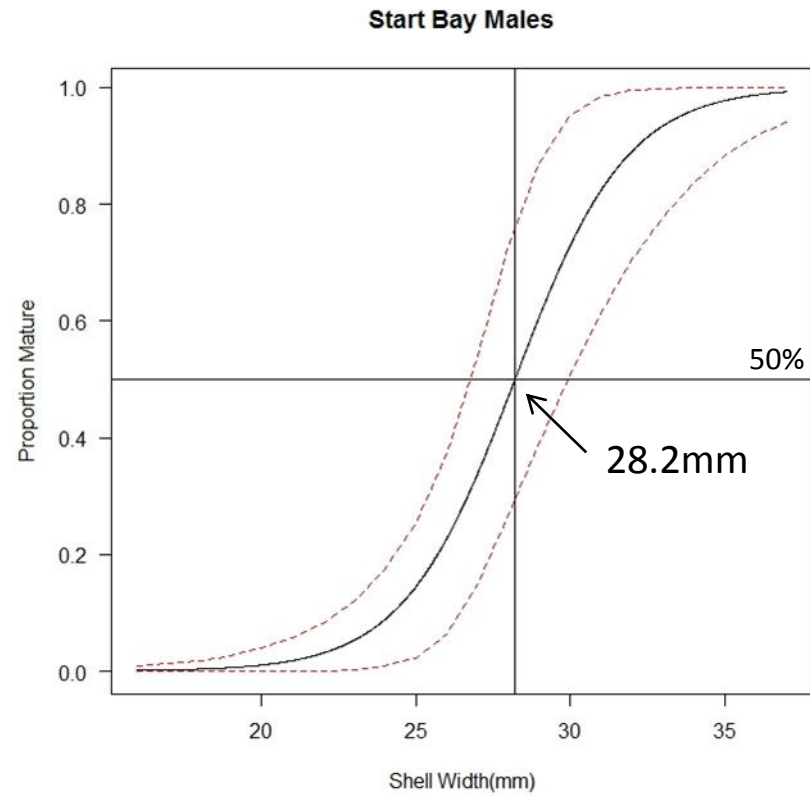
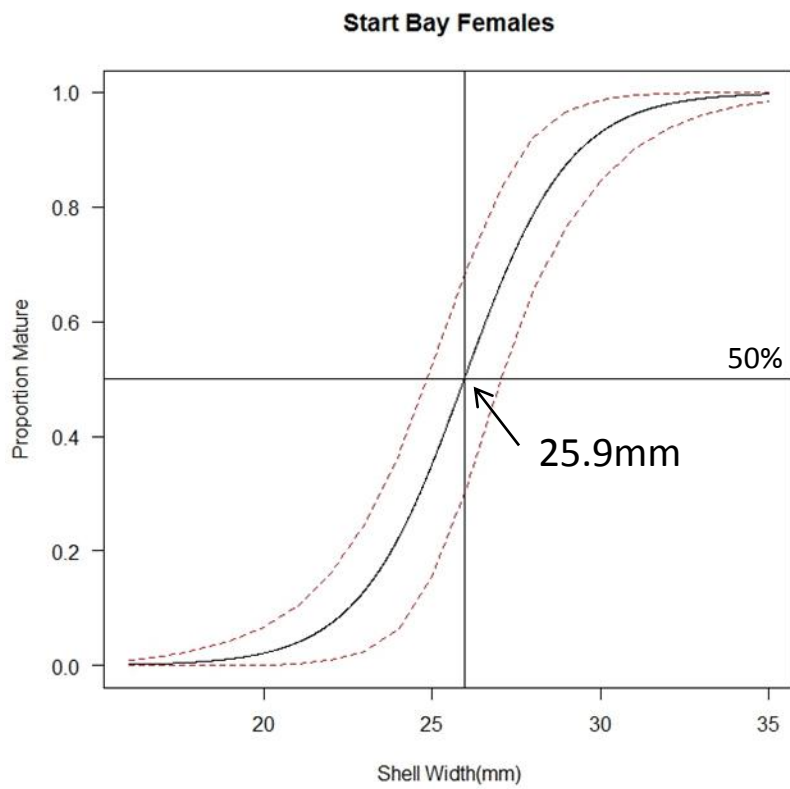
Additional Samples

- Discussed preliminary results with South Devon fishermen
- Concern from industry that Start bay have smaller SOM
- Extra samples collected from Start Bay by fisherman



Additional Samples

Size of maturity by shell width:



Conclusions & Implications

- 45mm shell height Minimum Conservation Reference Size is insufficient to protect spawning stocks

Site	Female SOM (shell height in mm)	Male SOM (shell height in mm)
Start Bay	57.8	64.4
Exmouth	69.3	70.9
Ilfracombe	76.5	76.4

- recruitment over-fishing is likely to be occurring
- Increasing MRCS will help the fishery to be more sustainable
- A minimum size based on shell width might simplify the sorting of large catch quantities or be used for guidance to set riddle width
- Potential for a closed season during times of peak reproductive activity
- Potential introducing size and number of escape gaps

Management Proposals

- IFCA proposing to increase Minimum Size by 5mm or 10mm increments over several years
- Allows whelks to continue to grow year on year
- Reduce impact on industry

		% mature at each shell height				
		45mm	50mm	55mm	60mm	65mm
Exmouth	Female	0.3	0.7	3	8	27
	Male	0.006	0.4	2	6	19
Ilfracombe	Female	0.09	0.5	1.6	4	10
	Male	0.002	0.2	0.5	2	6
Start Bay	Female	0.2	0.9	15	78	98
	Male	0.6	2	7.5	23.5	54

Ongoing Work

- Consultation has gone out to all Potting Permit Holders and interested parties – closing date **14th March 2018**
- Processors included in consultation
- Consultation on the increase of MCRS over several years
- IFCA welcomes information on economic impact of management changes from fishing industry
- IFCA gathering more information on spawning season - filling gaps in data

