

# The 3<sup>rd</sup> Annual Review Workshop

## FIP for the Orkney creel fishery

20 Jun 2016

M&S  
EST. 1884



# Application of MSC BMT tool to Orkney creel fisheries

# Review of BMT application in 2015

- Migrated to v2.0 of the MSC standard, main changes relating to P2:
  - § Definition of primary and secondary species clearer than previous distinction between retained and bycatch species
  - § Application of RBF to primary or secondary species (PSA) and to habitats (CSA) and ecosystems (SICA)
- Improvement to RBF gives unconditional pass for brown crab – selectivity now considered in relation to size at maturity
- Different options considered for treatment of other creel fishery target species (lobster, velvets, green crab)
  - § Brown crab as P1 species, other crustaceans as primary under P2
  - § Brown crab as P1 species, other crustaceans as secondary under P2 **Feasible**
  - § All crustaceans as P1 species for Orkney Creel Fishery **Best option?**

# Review of BMT application in 2015

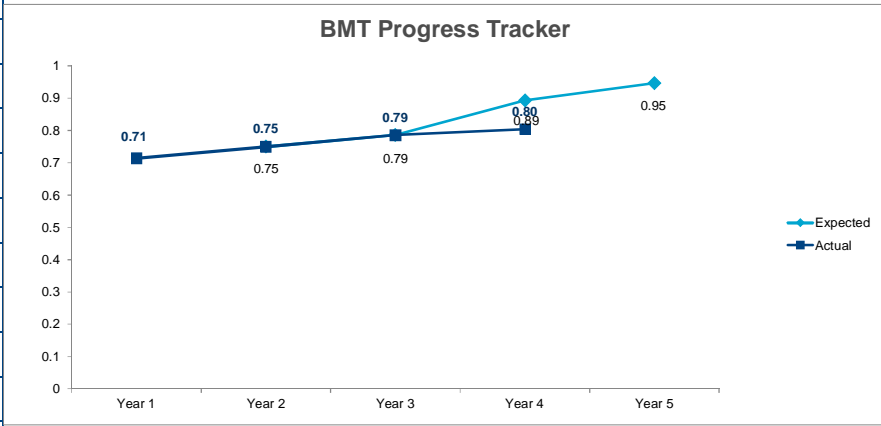
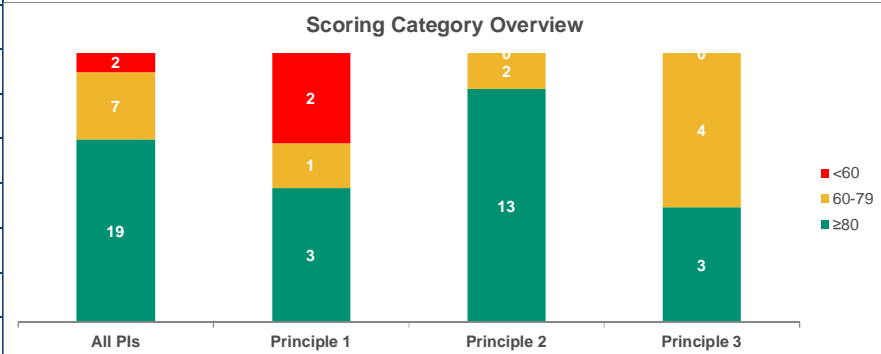
- Use of SICA for ecosystem outcome addressed issue of need for ecosystem modelling identified in 2012 pre-assessment
- Under all scenarios, the BMT showed the FIP to be on-track up to year 3
- Migration to 2.0 did not affect priorities for progressing the FIP
  - Ø Continued monitoring and assessment
  - Ø More focused review of P2 issues
  - Ø Explicit objectives for the fishery (P3)
  - Ø Define harvest strategy and harvest control rules (P1)
  - Ø Need for legislative instruments to apply controls

# BMT v2.1 for Orkney Creel Fishery

Principle	Component	Performance Indicator	Actual Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5	Actual Year 2	Status	Actual Year 3	Status	Actual Year 4	Status	Actual Year 5	Status
1	Outcome	1.1.1 Stock status	60-79	60-79	60-79	60-79	≥80	60-79	On Target	60-79	On Target	60-79	On Target	---	
		1.1.2 Stock rebuilding	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
	Management	1.2.1 Harvest Strategy	<60	<60	<60	60-79	60-79	<60	On Target	<60	On Target	<60	Behind	---	
		1.2.2 Harvest control rules and tools	<60	<60	<60	60-79	60-79	<60	On Target	<60	On Target	<60	Behind	---	
		1.2.3 Information and monitoring	<60	60-79	≥80	≥80	≥80	60-79	On Target	≥80	On Target	≥80	On Target	---	
		1.2.4 Assessment of stock status	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---		
2	Primary species	2.1.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
		2.1.2 Management	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
		2.1.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
	Secondary species	2.2.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
		2.2.2 Management	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
		2.2.3 Information	<60	60-79	≥80	≥80	≥80	60-79	On Target	≥80	On Target	≥80	On Target	---	
	ETP species	2.3.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
		2.3.2 Management	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
		2.3.3 Information	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
	Habitats	2.4.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
		2.4.2 Management	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
		2.4.3 Information	60-79	60-79	60-79	60-79	≥80	60-79	On Target	60-79	On Target	60-79	On Target	---	
	Ecosystem	2.5.1 Outcome	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
2.5.2 Management		≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---		
2.5.3 Information		60-79	60-79	60-79	60-79	≥80	60-79	On Target	60-79	On Target	60-79	On Target	---		
3	Governance and Policy	3.1.1 Legal and customary framework	<60	<60	<60	60-79	60-79	<60	On Target	<60	On Target	60-79	On Target	---	
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
		3.1.3 Long term objectives	60-79	60-79	60-79	≥80	≥80	60-79	On Target	60-79	On Target	60-79	Behind	---	
	Fishery specific management system	3.2.1 Fishery specific objectives	60-79	60-79	60-79	≥80	≥80	60-79	On Target	60-79	On Target	60-79	Behind	---	
		3.2.2 Decision making processes	60-79	60-79	60-79	≥80	≥80	60-79	On Target	60-79	On Target	60-79	Behind	---	
		3.2.3 Compliance and enforcement	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
		3.2.4 Management performance evaluation	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
Total number of PIs equal to or greater than 80			17	17	19	22	25	17		19		19			
Total number of PIs 60-79			6	8	6	6	3	8		6		7			
Total number of PIs less than 60			5	3	3	0	0	3		3		2			
<b>Overall BMT Index</b>			<b>0.71</b>	<b>0.75</b>	<b>0.79</b>	<b>0.89</b>	<b>0.95</b>	<b>0.75</b>		<b>0.79</b>		<b>0.80</b>			

Principle	Component	Performance Indicator	Expected Scoring Category: Year 4	Actual Scoring Category: Year 4	Status
1	Outcome	1.1.1 Stock status	60-79	60-79	On Target
		1.1.2 Stock rebuilding	≥80	≥80	On Target
	Management	1.2.1 Harvest Strategy	60-79	<60	Behind
		1.2.2 Harvest control rules and tools	60-79	<60	Behind
		1.2.3 Information and monitoring	≥80	≥80	On Target
		1.2.4 Assessment of stock status	≥80	≥80	On Target
2	Primary species	2.1.1 Outcome	≥80	≥80	On Target
		2.1.2 Management	≥80	≥80	On Target
		2.1.3 Information	≥80	≥80	On Target
	Secondary species	2.2.1 Outcome	≥80	≥80	On Target
		2.2.2 Management	≥80	≥80	On Target
		2.2.3 Information	≥80	≥80	On Target
	ETP species	2.3.1 Outcome	≥80	≥80	On Target
		2.3.2 Management	≥80	≥80	On Target
		2.3.3 Information	≥80	≥80	On Target
	Habitats	2.4.1 Outcome	≥80	≥80	On Target
		2.4.2 Management	≥80	≥80	On Target
		2.4.3 Information	60-79	60-79	On Target
	Ecosystem	2.5.1 Outcome	≥80	≥80	On Target
		2.5.2 Management	≥80	≥80	On Target
		2.5.3 Information	60-79	60-79	On Target
3	Governance and Policy	3.1.1 Legal and customary framework	60-79	60-79	On Target
		3.1.2 Consultation, roles and responsibilities	≥80	≥80	On Target
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	Fishery specific management system	3.2.1 Fishery specific objectives	≥80	60-79	Behind
		3.2.2 Decision making processes	≥80	60-79	Behind
		3.2.3 Compliance and enforcement	≥80	≥80	On Target
		3.2.4 Management performance evaluation	≥80	≥80	On Target
Total number of PIs equal to or greater than 80			22	19	
Total number of PIs 60-79			6	7	
Total number of PIs less than 60			0	2	
<b>Overall BMT Index</b>			<b>0.89</b>	<b>0.80</b>	

# BMT v2.1 applied to Orkney Creel Fishery



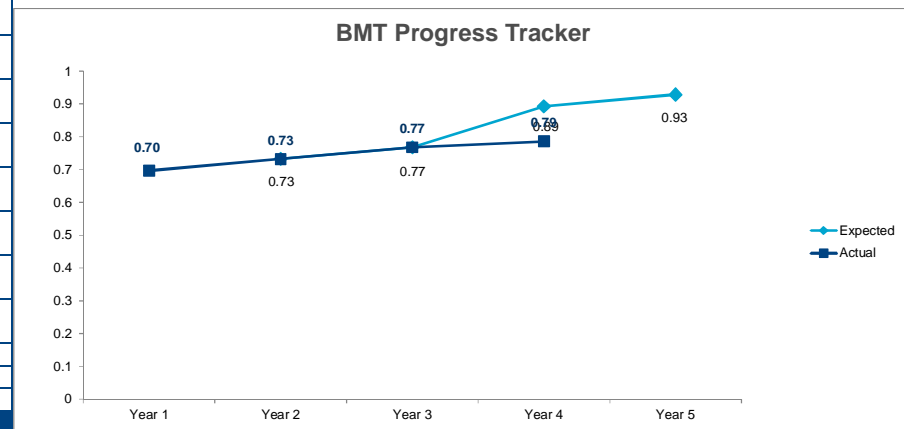
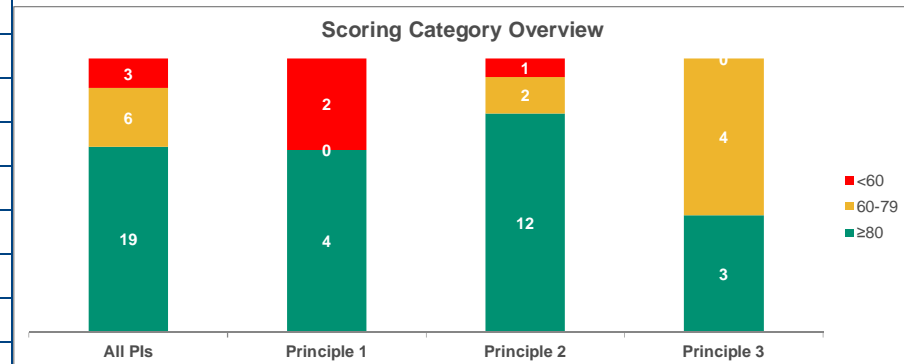
# BM v2.1 for Orkney Brown Crab Fishery

Principle	Component	Performance Indicator	Actual Year 1	Expected Year 2	Expected Year 3	Expected Year 4	Expected Year 5	Actual Year 2	Status	Actual Year 3	Status	Actual Year 4	Status	Actual Year 5	Status
1	Outcome	1.1.1 Stock status	≥80	≥80	≥80	≥80	≥80	≥80	On Target	≥80	On Target	≥80	On Target	---	
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		1.2.2 Harvest control rules and tools	<60	<60	<60	60-79	60-79	<60	On Target	<60	On Target	<60	Behind	---	
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Total number of PIs 60-79			6	6	
Total number of PIs less than 60			0	3	
<b>Overall BMT Index</b>			<b>0.89</b>	<b>0.79</b>	

BMT v2.1 applied to Orkney Brown Crab Fishery

∅ Main difference is that lobster, velvet crab and green crab are treated as secondary species





# What the BMT tells us about concluding the FIP...

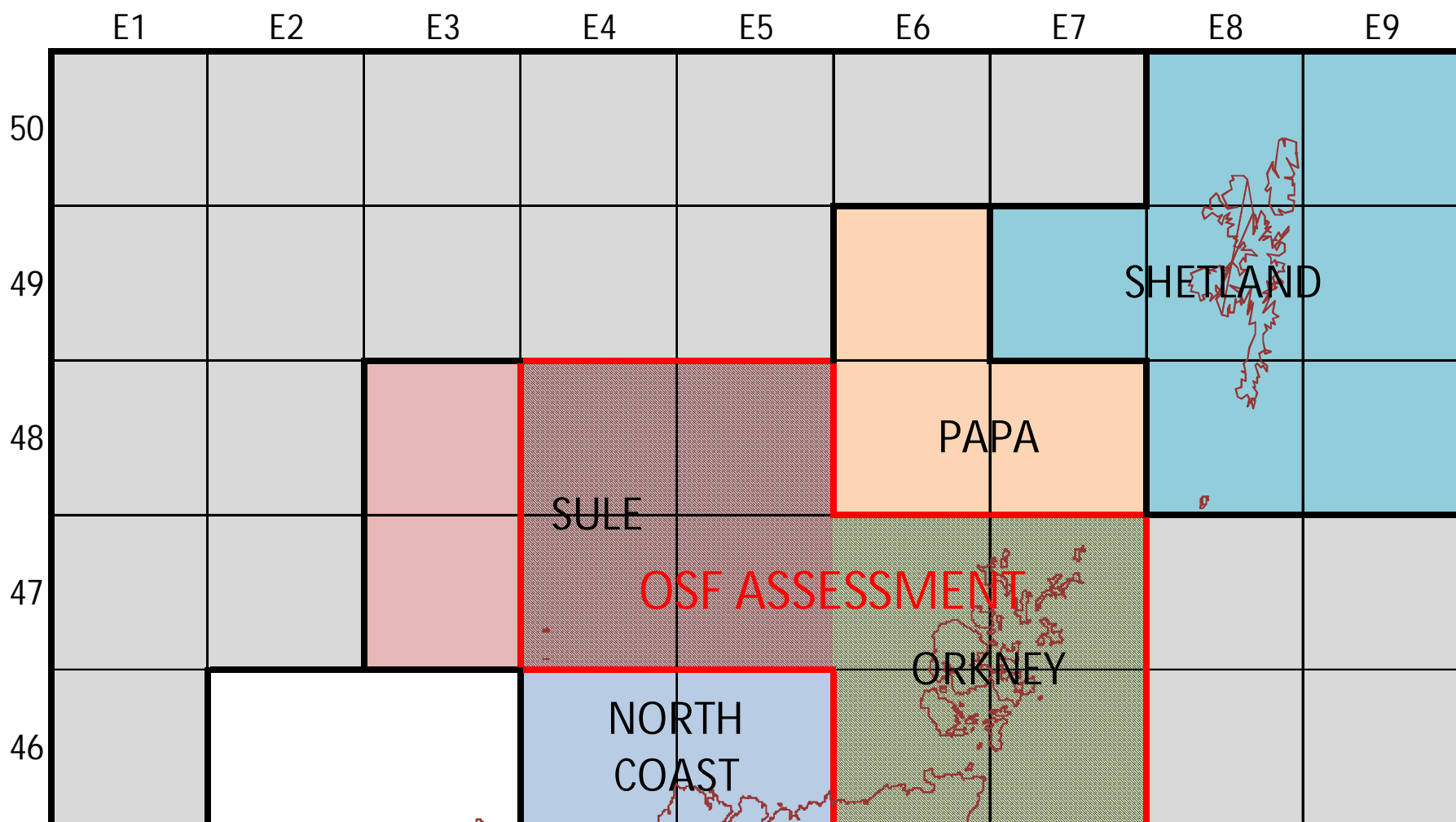
- Monitoring and assessment is on track and provides the basis for ongoing needs
- Main issue requiring attention is the definition of a harvest strategy and its supporting objectives, criteria and controls
- RBF will likely meet assessment needs going in to full assessment

# Approaches to stock assessment

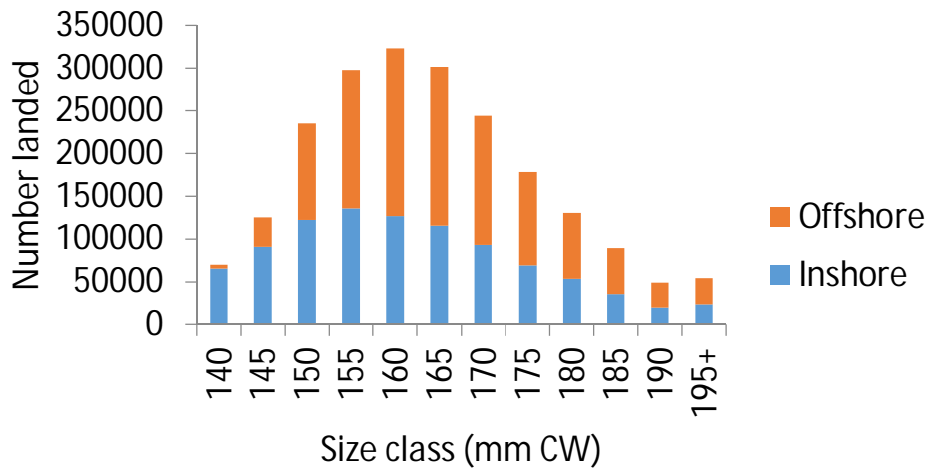
- Three elements:
  - Stock assessment in its broadest sense, including examination of trends in catch statistics, effort, multiple indicators
  - Analytical stock assessment model that allows current and potential future status to be judged in relation to criteria for sustainability
  - Link between assessment outcomes and management outcomes (i.e. harvest control rules), with assessment of risk through forward projection

# Approaches to stock assessment

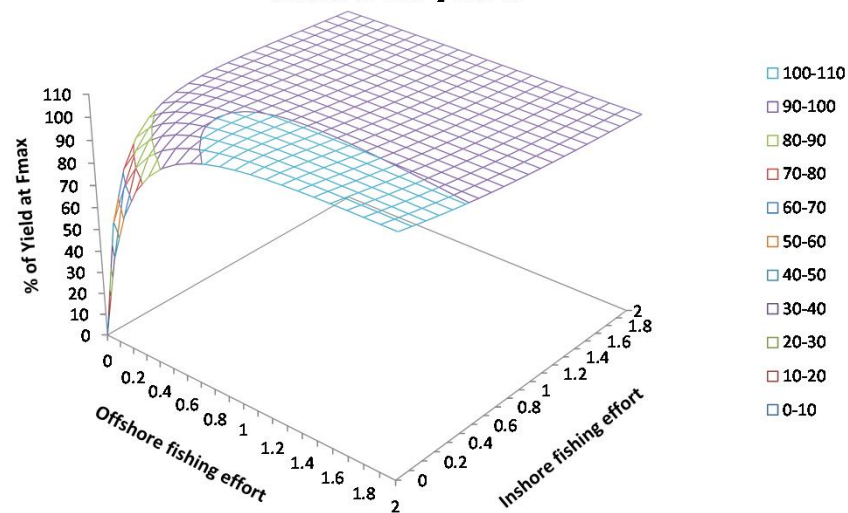
- Analytical approach applied so far is Length Cohort Analysis, similar to Marine Scotland assessments
- Advantages:
  - Modest data requirements (length composition, biological parameters)
  - Easy generation of criteria for yield and spawning potential, with potential for use as target reference points
  - Clear link to knowledge of biology
- Disadvantages
  - Assumes equilibrium, which can only ever be approximated, likely causes slow and/or erroneous detection of dynamic changes and responses to management
  - Difficult to account for uncertainties in systematic way
  - Imprecise location of potential reference points, particularly for yield



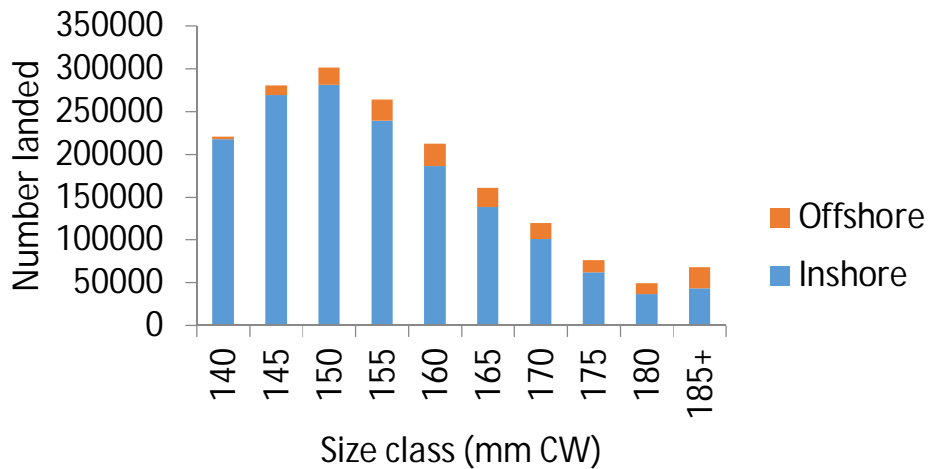
### Females



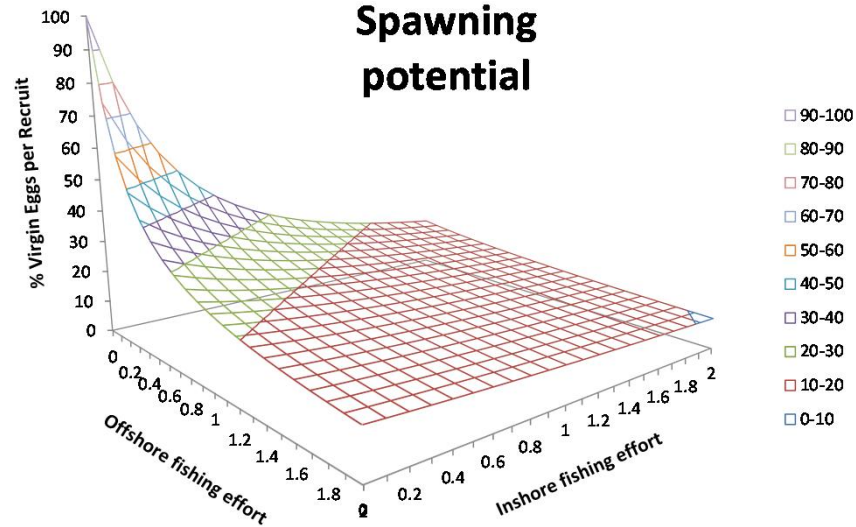
### Relative yield



### Males



### Spawning potential



# Going forward...

- As time series of CPUE and other indicators accrue, it is likely that we will move to more defensible dynamic methods which are more realistic, more responsive, and also more challenging in their data needs
- But... if there are HCR that link management controls to stock status determination, any change which affects this determination might lead to undesirable discontinuities in management

# Going forward...

- An alternative is to de-couple the analytical stock assessment from the HCR
- Instead, management could be linked to measurement of CPUE:
  - **Target CPUE** based on what past experience says is typical of a productive Orkney fishery
  - **Limit CPUE** based on what would be considered an unacceptably low catch rate in Orkney
  - Statistical (GLM or GLMM) **standardization of CPUE** based on logbook records and use of 3-year running average would provide stable status determination
  - **HCR** linking management response to the position of standardized CPUE in relation to target and limit could set limits on interannual changes in controls

# Going forward...

- This type of approach is applied in the Tristan da Cunha rock lobster fishery, termed '**Operational Management Procedures**' (OMP)
- Management is thus driven by directly measured changes in availability of stock to the fishery rather than model-based quantities sensitive to the choice of assessment procedure
- Analytical assessments periodically updated:
  - To provide a sense check of the OMP in relation to MSY-type indicators
  - To project future stock and fishery trajectories under OMP scenarios
- Dynamic assessment methods are being considered...