Devon & Severn IFCA

Management for sustainable fisheries in D&S IFCA District

Participation & Data

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Deputy Chief Officer
(Environment)

Live Wrasse Pot Fishery Case

When participation by fishermen pays off

Today's Talk

- Background to the fishery
- Five species of wrasse
- Impacts of a fishery on wrasse biology
- Impacts of a fishery on wrasse ecology
- Initial management of the fishery
- Research work
- Revised management of the fishery
- Participation Summary

Background

- Control of sea lice in salmon farms
- Commercial fishery for live wrasse
- Supply from hatcheries vs. demand

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A new fishery for wrasse

- Inshore species
- No EU management
- Bycatch in trawls and nets – pot bait
- New fishery emerged in 2015
- Control of sea lice in salmon farms
- Immediate interest from NGOs, media etc.

Live Wrasse Fishery in other Countries

Norway

- 4 species of wrasse – Goldsinny & Corkwing most popular
- In 2014 14 million wrasse used in salmon farms
- Fishery has moved from the north where farms are located to the south and into Sweden
- Minimum size 11cm for most spp – for corkwing 12cm
- Fishery minimum size – 15cm for Ballan
- To protect spawning fishery closed until 11th July in 2016
- Over exploitation of fish over 10cm in size predicted

Live Wrasse Fishery in other Countries

Ireland – Mulroy Bay & Lettercallow Bay

- Confined fishing area
- Fishery for goldsinney & corkwing
- Catch per unit effort of the two species decrease significantly in second year of fishery
- Reduction in corkwing males >13cm suggest depletion of larger males

Scotland

- fishery started around salmon farm areas –West Scotland and Isles
- Spread around coast
- Undocumented
- Demand increase and/ or supply decrease has led to fishery spread to SW England

Fishery in South West England

- In South West since 2015
- To date three main areas

IFCA District	Location	Number of Vessels	Number of Pots per vessel	Number of salmon farms being supplied
Southern	Portland & Weymouth	7 -10	35-150	2
Cornwall	Fal Estuary & Coastline, Plymouth Sound	5	100-150	2
Devon & Severn	Plymouth Sound and coastline	3-4	100-150	1

- Demand for live wrasse 20,000 to 30,000 per year per location per salmon farm

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Fishery in Devon and Severn IFCA District

- S153 of the MaCAA 2009 – ensure the exploitation of sea fishery resources is carried out in a sustainably
- Liaison with fishermen and salmon farm agents to understand the fishery
- Light weight pots supplied by salmon farm
- Holding tanks on board
- Mitigating measure to allow undersize to be returned alive
- Keep /store cages in harbours
- Weekly pick up from port
- Transported to Scotland in aerated, temperature controlled vivier tanks

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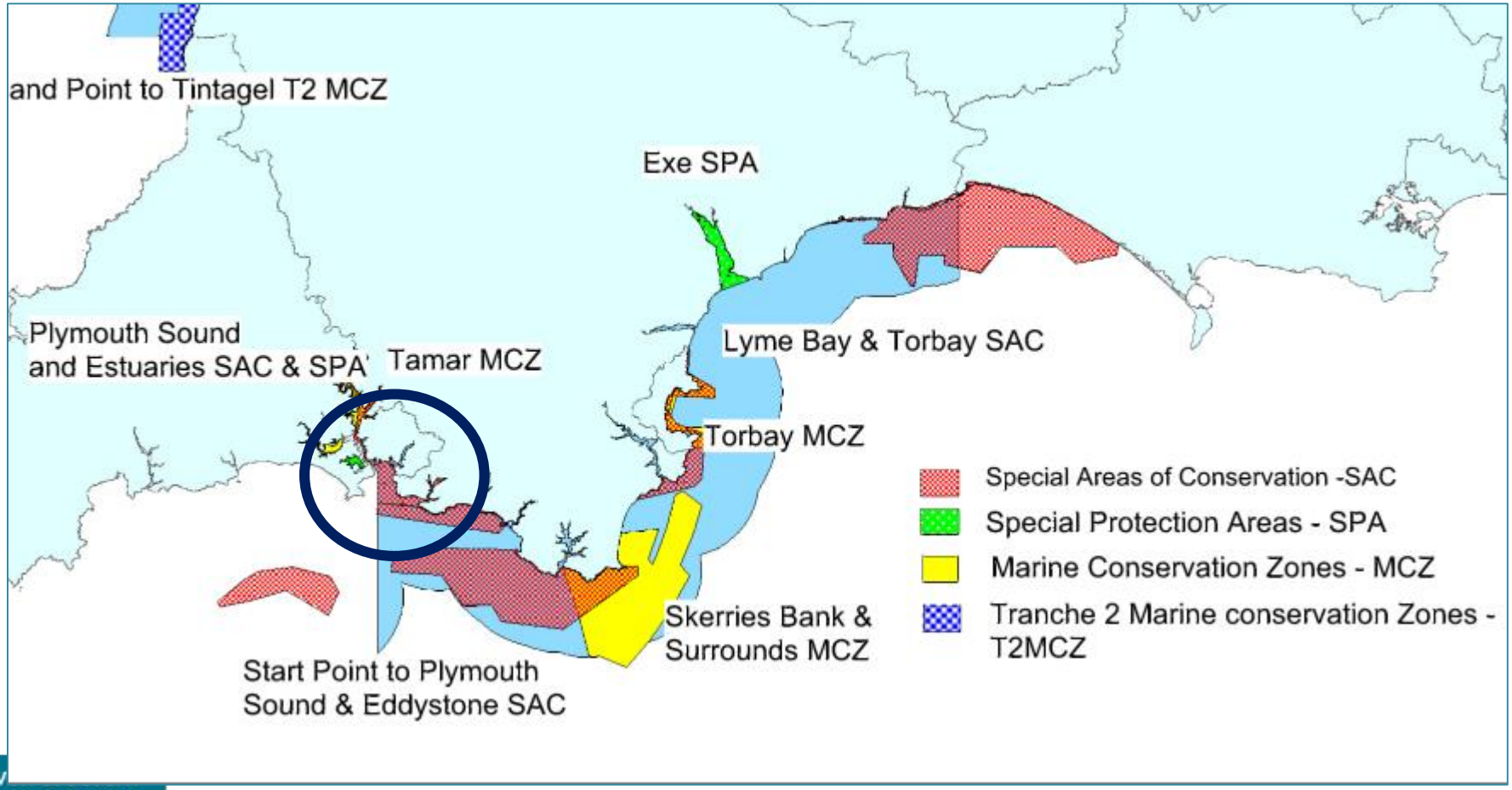
Fishery in Devon and Severn IFCA District - 2017



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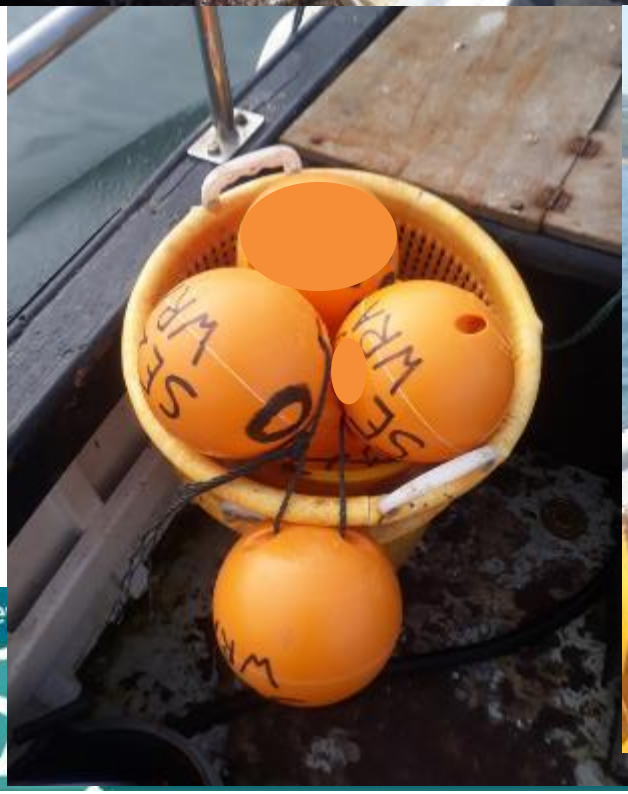
What does the Wrasse Fishery look like?



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Wrasse species

- Ballan (*Labrus bergylta*)
- Cuckoo (*Labrus mixtus*)
- Goldsinny (*Ctenolabrus rupestris*)
- Corkwing (*Symphodus melops*)
- Rock cook (*Centrolabrus exoletus*)

Distribution: Mediterranean to West Baltic Sea.
Habitat: inshore rocky reefs, kelp forests and seagrass beds.
Diet: molluscs and crustaceans – cleaner fish
Activity: diurnal and seasonal – hibernate in winter <7^{o}C
Reproduction: different strategies for larger and smaller spp.
Spawning: April to September. Most species have benthic eggs & males provides care
Sizes: ballan up to 60cm, cuckoo 35cm, rock cook to 15cm, goldsinny ~ 15cm, corkwing <25cm
Size at sexual maturity: Ballan M-28cm F-16/18cm; Cuckoo M 24cm F 16cm; goldsinny 9.5cm; corkwing 10cm
Sex change: ballan, cuckoo
Accessory males: goldsinny, corkwing

Characteristics	Ballan wrasse (Labrus bergylta)	Cuckoo wrasse (Labrus mixtus)	Rock cook (Centrolabrus exoletus)	Goldsinny (Ctenolabrus rupestris)	Corkwing (Symphodus melops)
Size range (cm)	Typical size 30-40cm. Up to 60.	Grows to 35cm and females generally smaller.	Usually grows to 12cm, but some reach 15cm.	Usually 12cm, some reach up to 20cm.	Usually 15cm, some reach up to 25cm.
Maximum age (years)	29	17	9	16	9
Age at maturity (years)	Females & males 6-9	Females 2, males 6-9	Females 2	Females 2	Females 2-3
Size at maturity (cm)	Females 16-18, males 28	Females 16, males 24	?	9.5	10
Sex change	Yes	Yes	?/No	No	No
Accessory males	No	No	?	Yes	Yes
Territorial	Yes	Yes	Yes	Yes	Yes
Spawning season (Atlantic)	April - August	May - July	May - August	April - September	April - September
Spawning place	Nest (gravel & rock)	Nest (gravel)	?	Mid-water	Nest (algae)
Fecundity (1000 eggs yr^{-1})	150	?	?	20	50
Egg type	Benthic	Benthic	Benthic	Planktonic	Benthic
Nest building by	Female	Male and female	?	N/A	Male
Parental care	Male	Male	?	None	Male
Key habitat	Juveniles found in the intertidal and rock pools, adults found in sublittoral rocky areas reef and kelp forests.	Sublittoral rocky reefs.	Rocky reefs and seaweed. Often found in seagrass beds.	Rocky reefs and boulder slopes, with holes, caves and crevices for refuge. Distribution unaffected by macroalgal cover.	Common in the intertidal and rock pools, with dense seaweed. Subtidal rocky areas with dense seaweed. Often found in seagrass beds.
Depth (m)	Depth range from 5m to at least 30m. Juveniles can be in <5m.	Depth range from 2-200m, but mainly between 20-80m.	Depths of 3-25m.	Occasionally found <10m, mostly juveniles. Prefer deeper water between about 10 to 50m.	More commonly found at depths <5m, although they can occur to depths of 30m or up to 50m.
Exposure	All conditions of exposure. Mostly found in intermediate wave exposure stations.	No specific exposure level, found at all stations.	Relatively more abundant at more exposed stations, Smaller fish (<11cm) occurred mainly in sheltered areas.	Mostly found in intermediate wave exposure stations, Smaller fish (<11cm) occurred mainly in sheltered areas. Distribution unaffected by current speed.	More abundant in sheltered area. Nests found in sheltered north facing crevices.
Main diet type	Crustacea and Mollusca	Crustacea and Mollusca	Crustacea and Mollusca	Crustacea and Mollusca	Crustacea and Mollusca

Biology – Potential Impacts

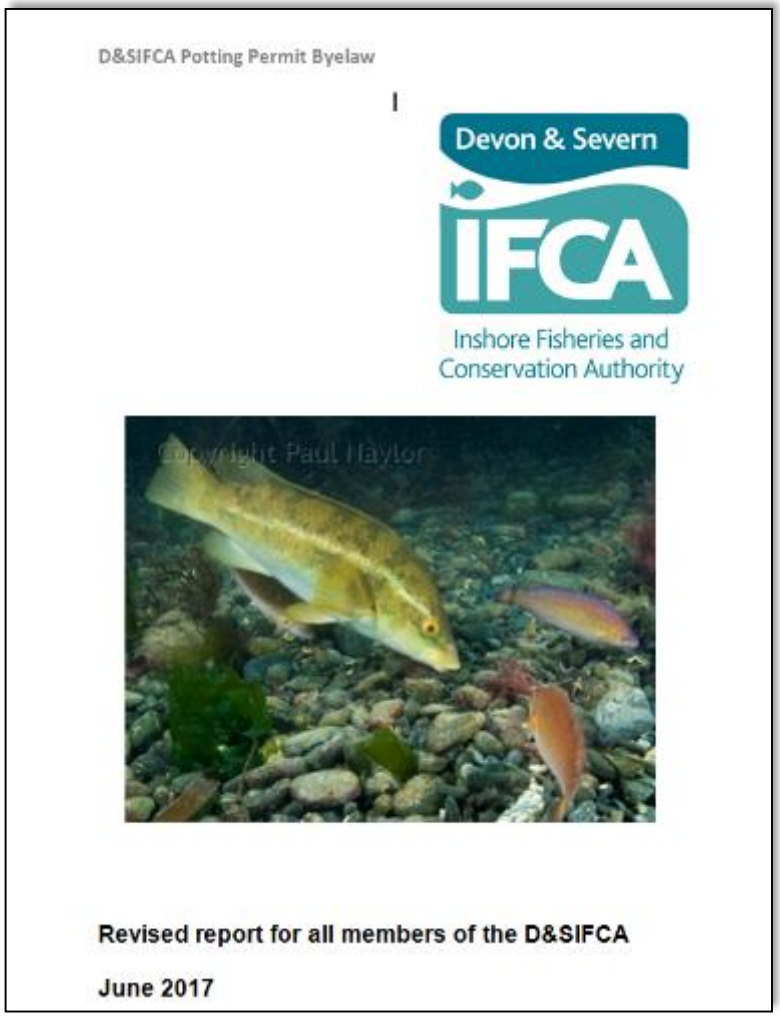
1. *Population structure* -size and age at maturity
2. *Social structures* - territory, dominance hierarchy, larger males, sex change ratio
3. *Spawning season* - nesting males, egg production & survival
4. *Genetics* -territorial behaviour, benthic eggs, spatial differences in habitats

Ecology – Potential Impacts

1. *Marine protected areas* -SACs and MCZs
2. *Wrasse pots* – abrasion and by-catch (light weight and selective)
3. *Habitat/ prey interactions* – shift in community structure due to loss of grazing e.g. kelp - trophic cascade
4. *Cleaning behaviour* – other fish spp
5. *Predation –* important as prey for predators

Management

- Literature review and consideration of fisheries in other countries and other IFCAs (SIFCA & CIFCA)
- Meetings and discussion with fishermen and salmon farm
- Produced evidence within a revised report to the Byelaw subcommittee
- Immediate review of Potting Permit conditions to include the wrasse fishery (as opposed to an emergency byelaw)



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Management introduced in June 2017

1. To implement a fully documented fishery
2. To implement a 120 pot limit per permit holder
3. To require the marking of wrasse gear with ‘WRA’ and Vessel’s PLN, & wrasse pots marked with tags
4. To establish a closed spawning season from 1st April to 30th June for the live wrasse pot fishery

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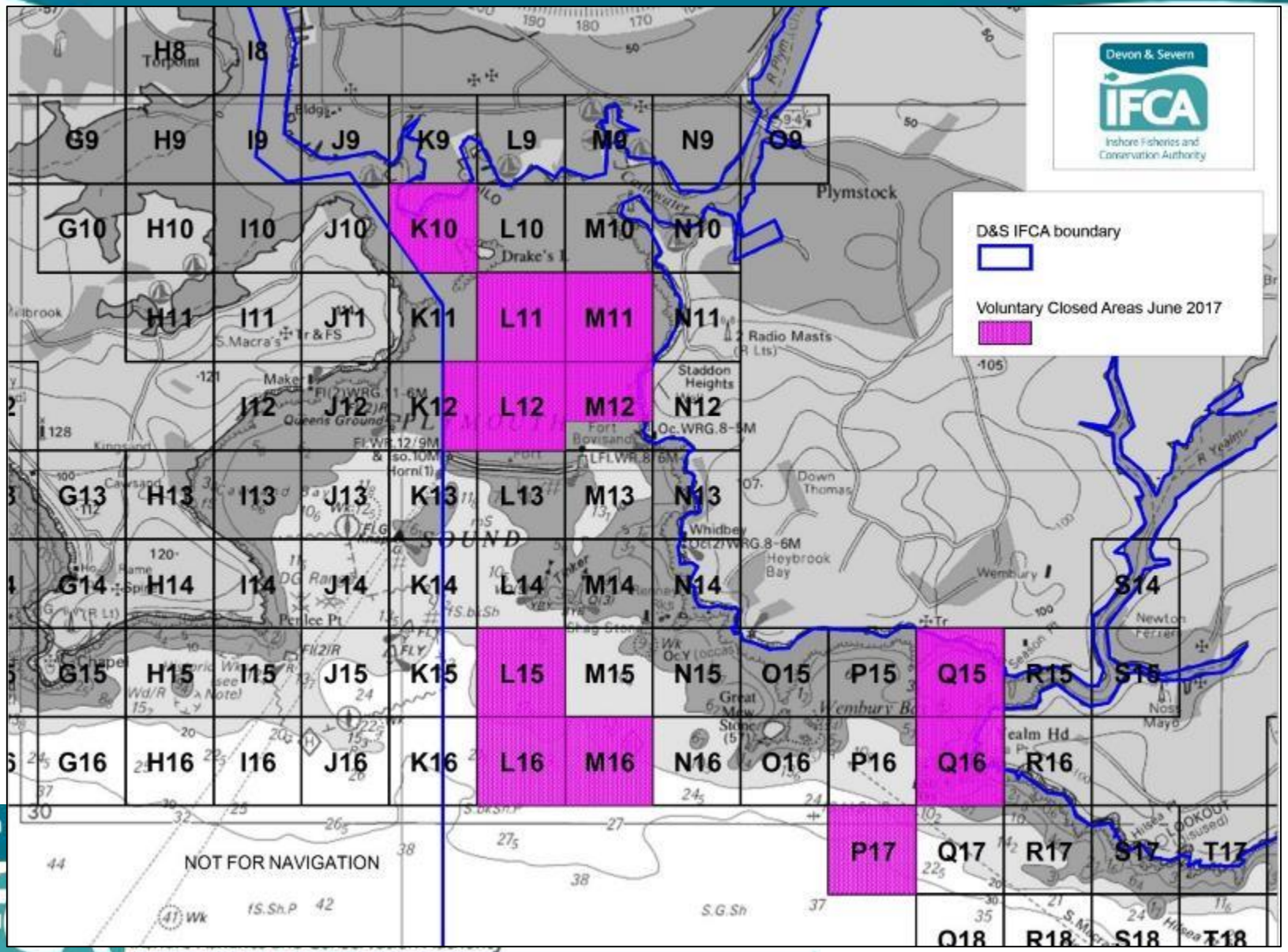
Management introduced in June 2017

5. To introduce Minimum and Maximum Conservation Reference Sizes for five species of wrasse

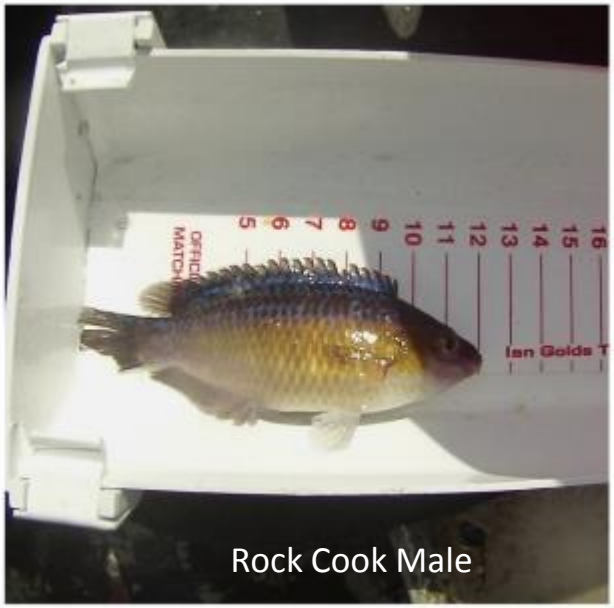
Species	Minimum Size- cm	Maximum size -cm
Ballan	15	23
Cuckoo	15	23
Corkwing	12	23
Goldsinny	12	23
Rock Cook	12	23

Voluntary Closed Areas – Collaboration with Industry

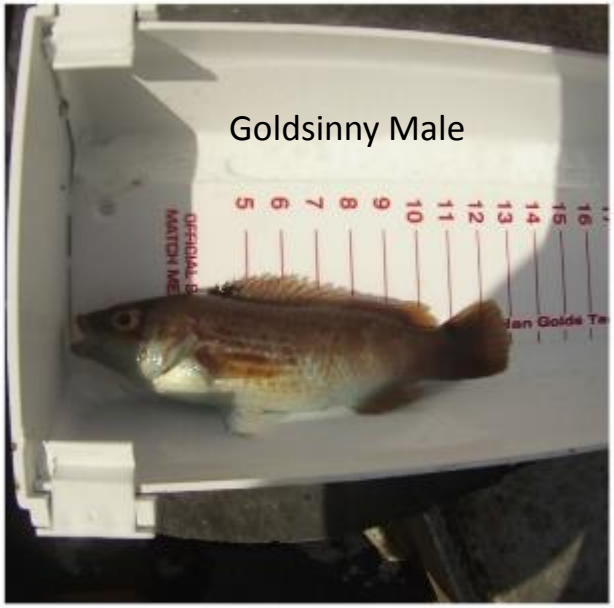


D&S IFCA Survey Work

- On board surveys - April to October
- Record total number of fish caught
- Catch/ species composition
- Sizes of kept and returned fish
- Spawning condition
- Fishing effort and location - precise
- Sharing data with CIFCA


Rock Cook Male


Rock Cook Female


Goldsinny Male


Goldsinny Female

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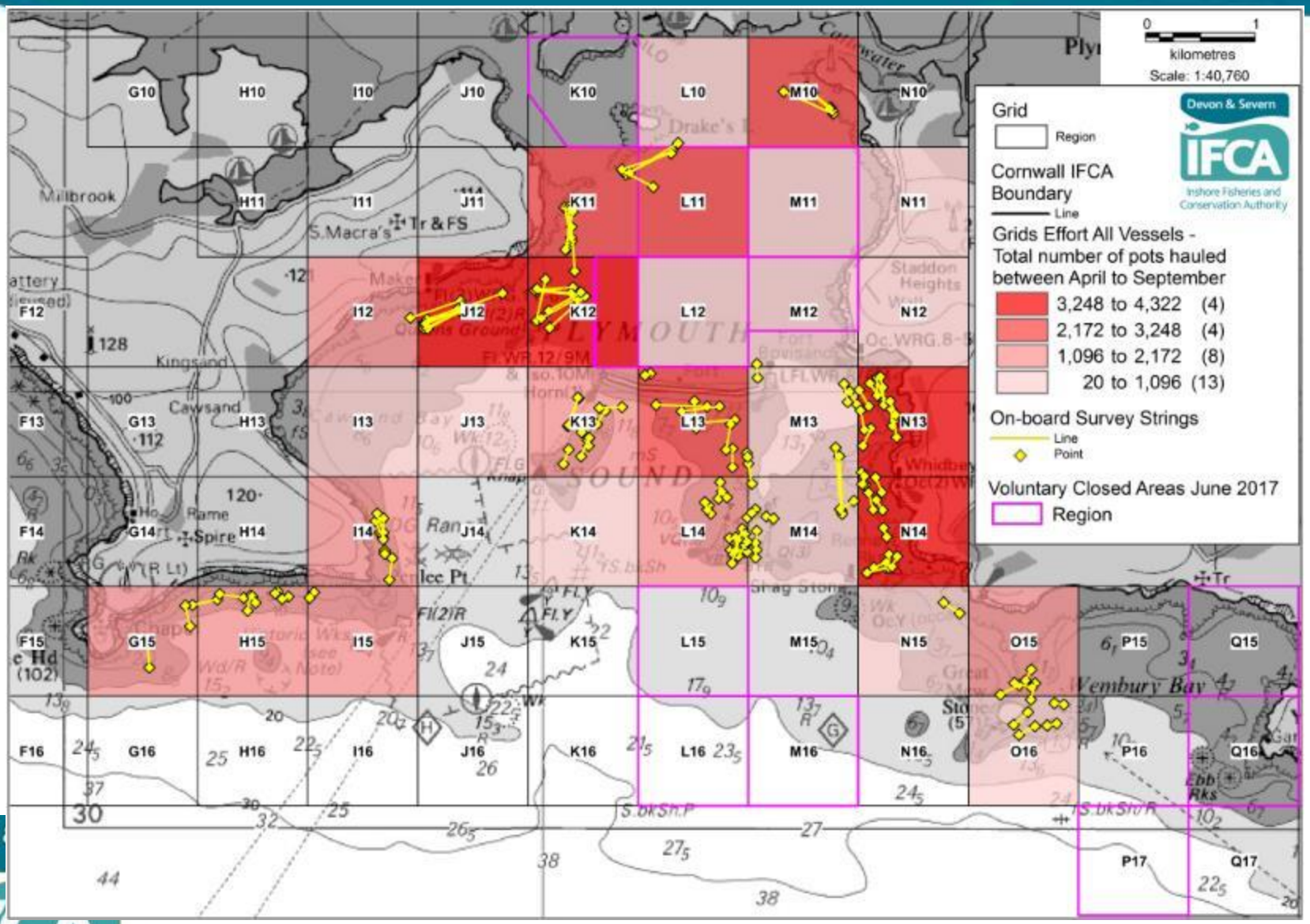
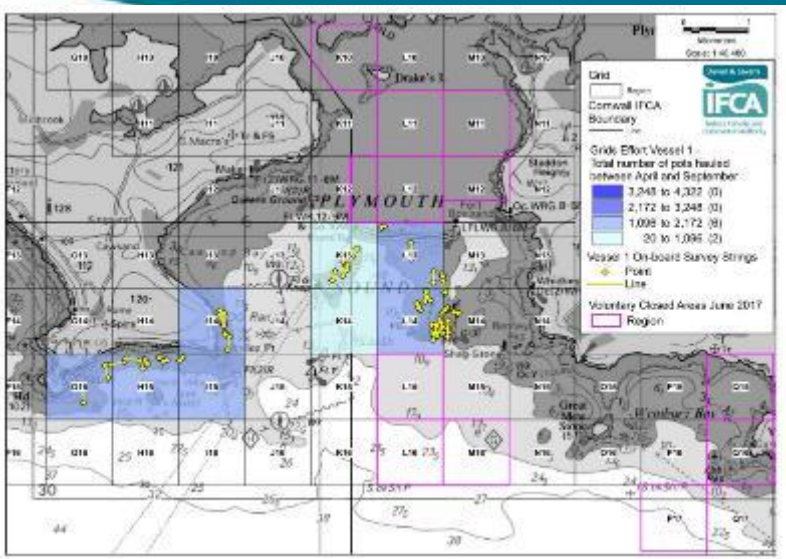
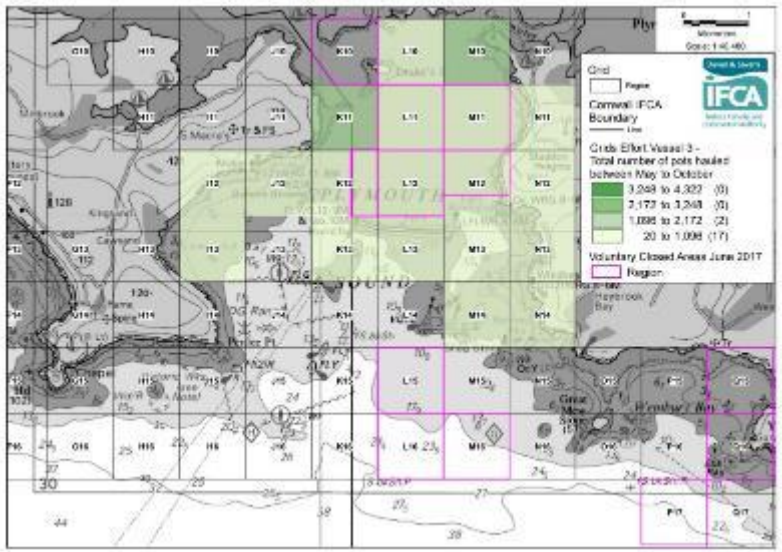
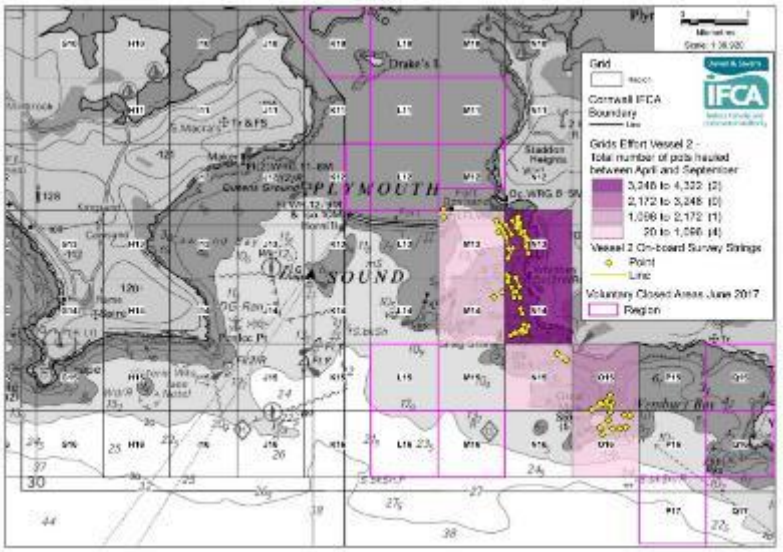
Spatial Effort – On-board Surveys and Fishermen's returns

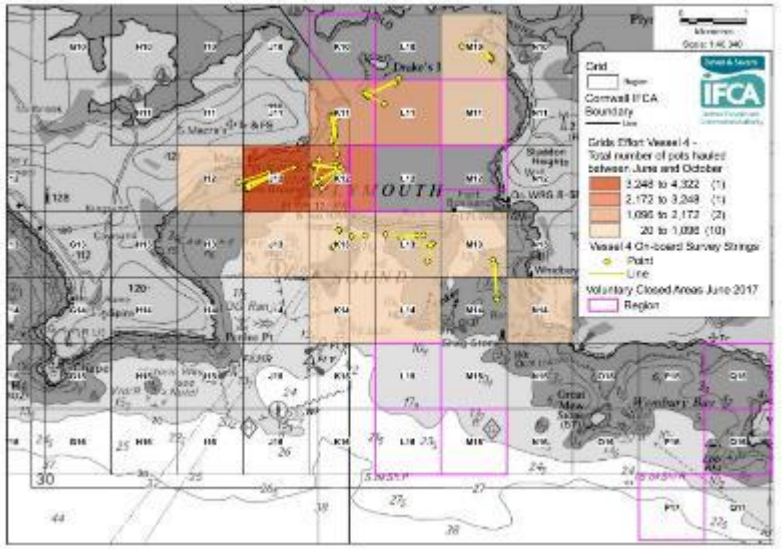


Spatial Effort – Each Vessel









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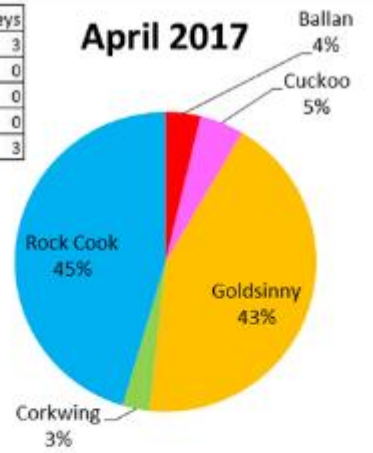
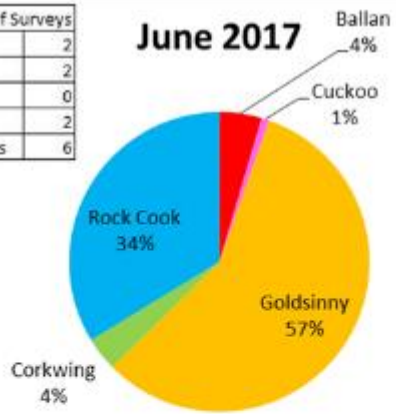
Monthly Catch Composition

- Surveys undertaken on 3 out of 4 vessels
- Catch composition collected during on-board surveys

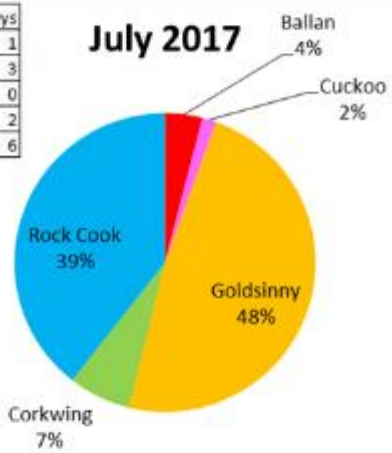
Number of Surveys	
Vessel 1	3
Vessel 2	0
Vessel 3	0
Vessel 4	0
All Vessels	3



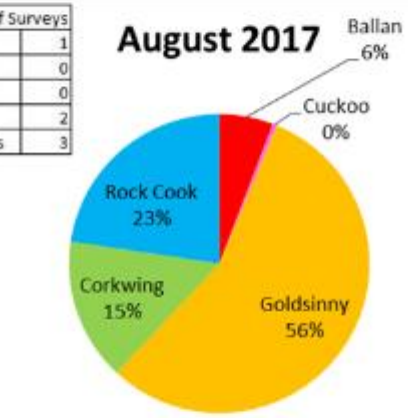
Number of Surveys	
Vessel 1	2
Vessel 2	2
Vessel 3	0
Vessel 4	2
All Vessels	6



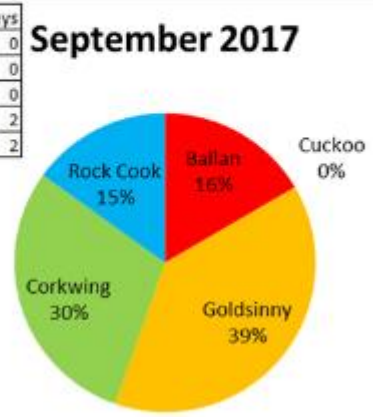
Number of Surveys	
Vessel 1	1
Vessel 2	3
Vessel 3	0
Vessel 4	2
All Vessels	6



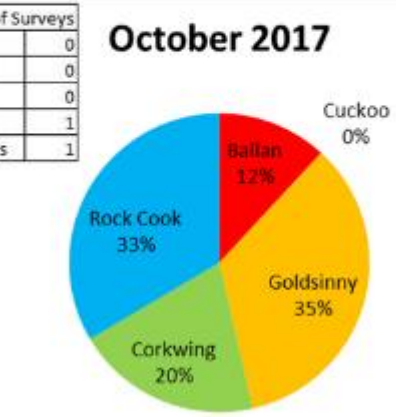
Number of Surveys	
Vessel 1	1
Vessel 2	0
Vessel 3	0
Vessel 4	2
All Vessels	3



Number of Surveys	
Vessel 1	0
Vessel 2	0
Vessel 3	0
Vessel 4	2
All Vessels	2



Number of Surveys	
Vessel 1	0
Vessel 2	0
Vessel 3	0
Vessel 4	1
All Vessels	1



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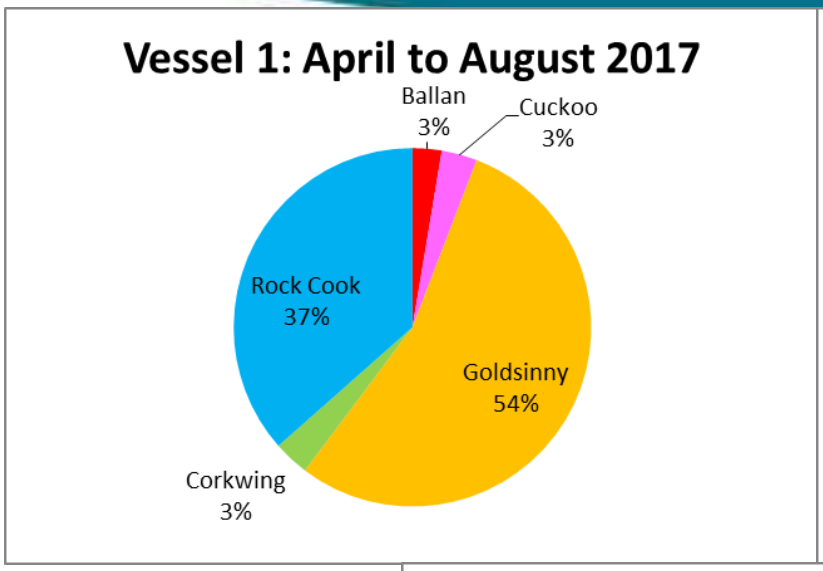
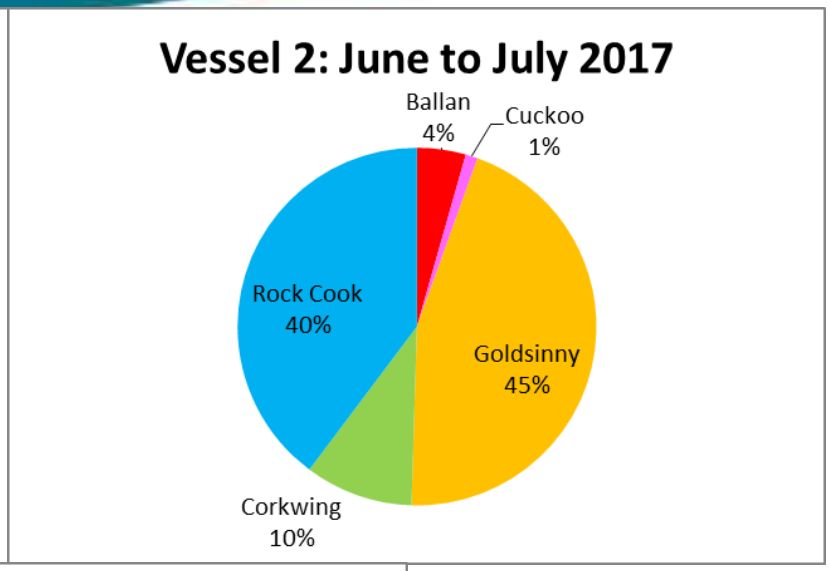
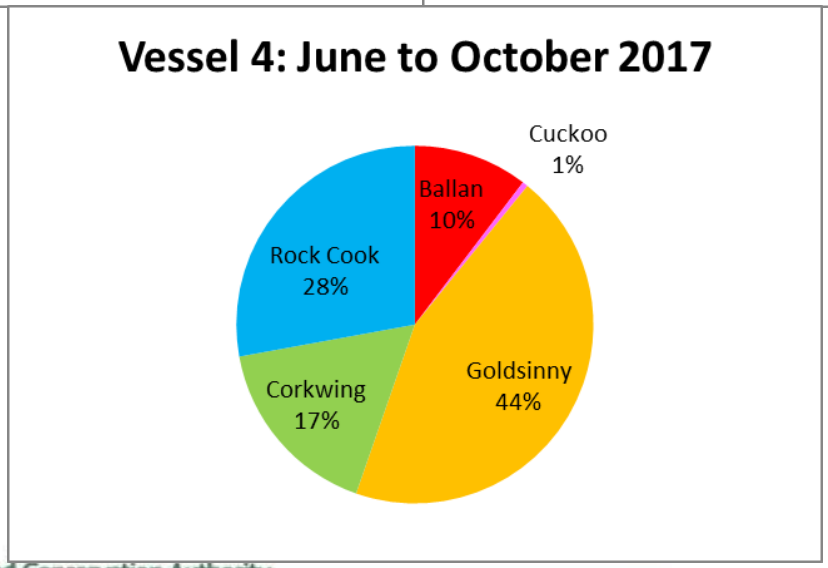
Catch Composition Per Vessel Over The Whole Season







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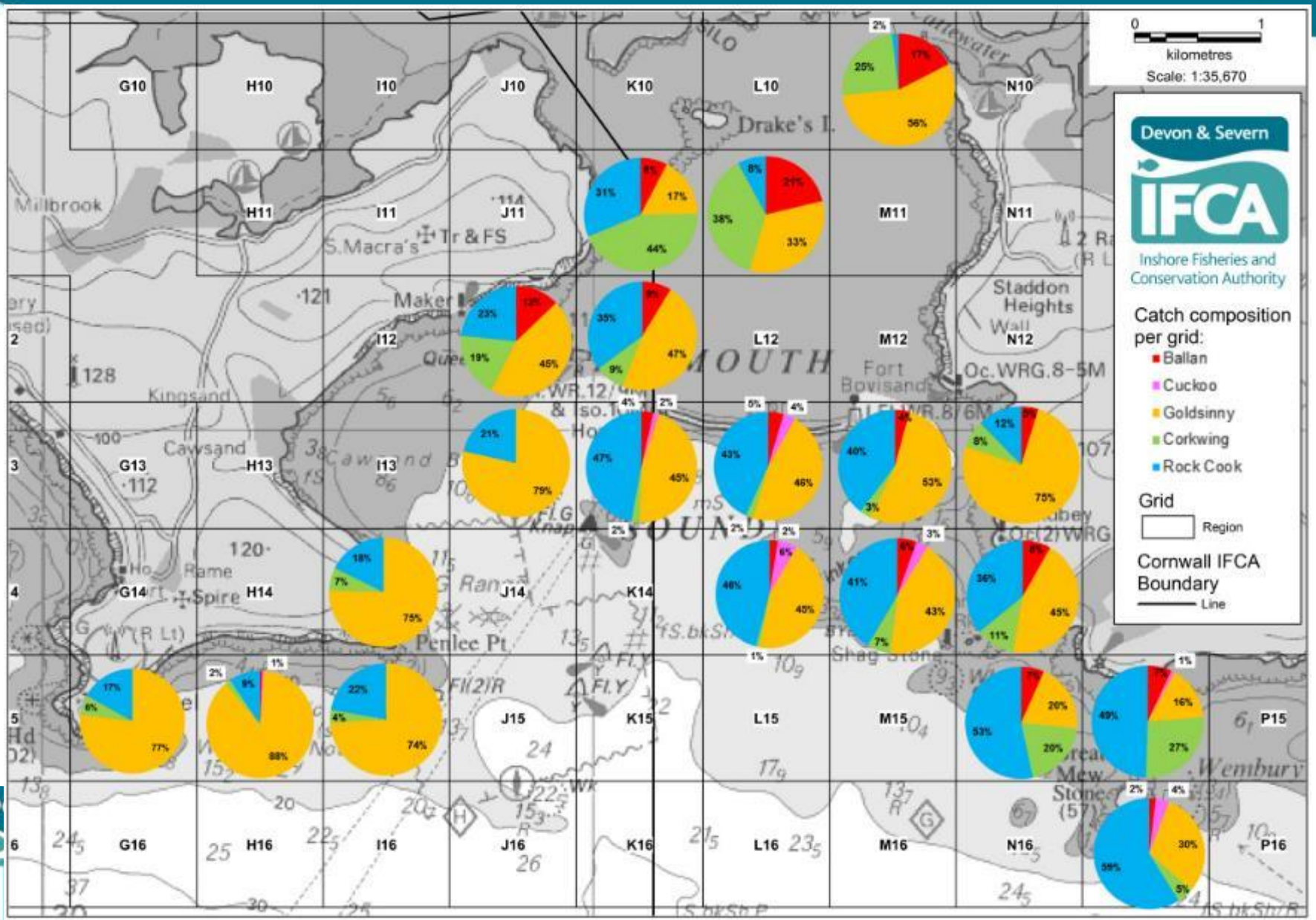
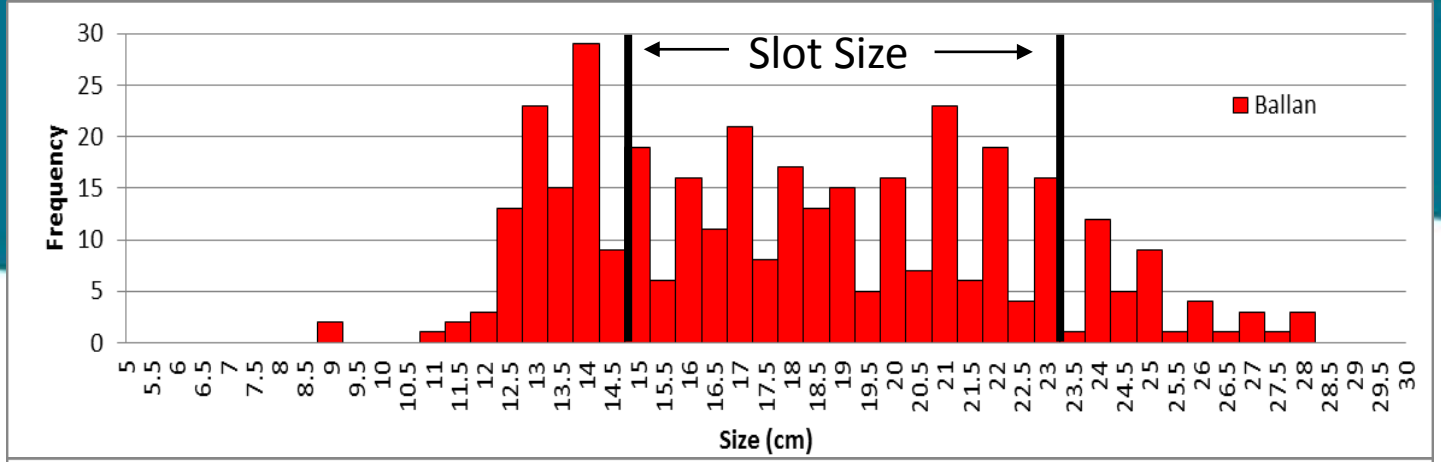
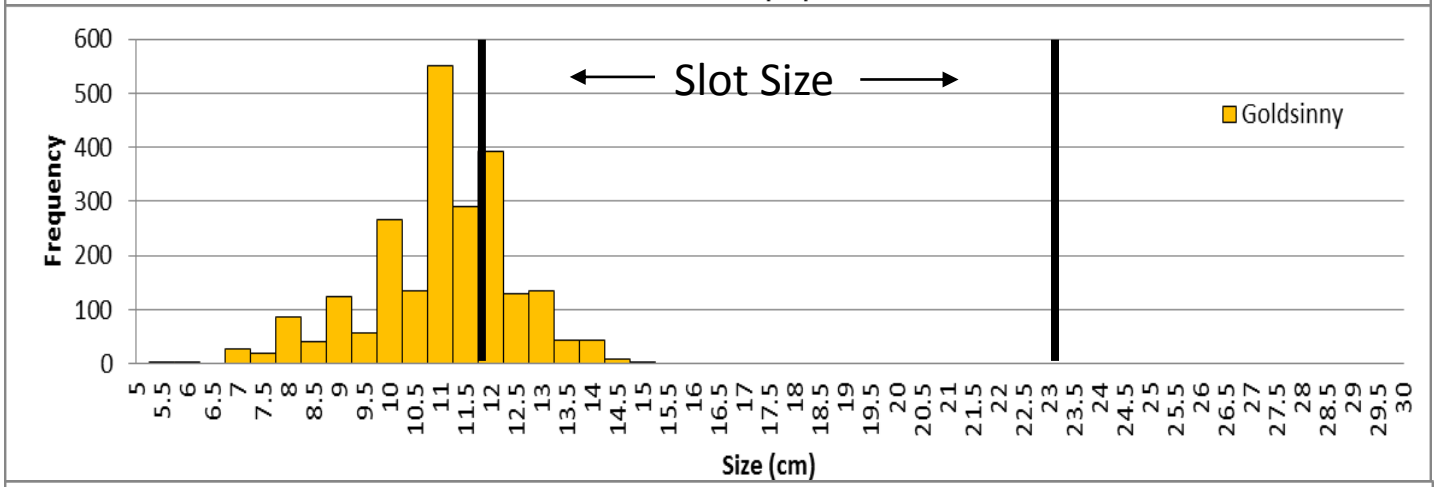
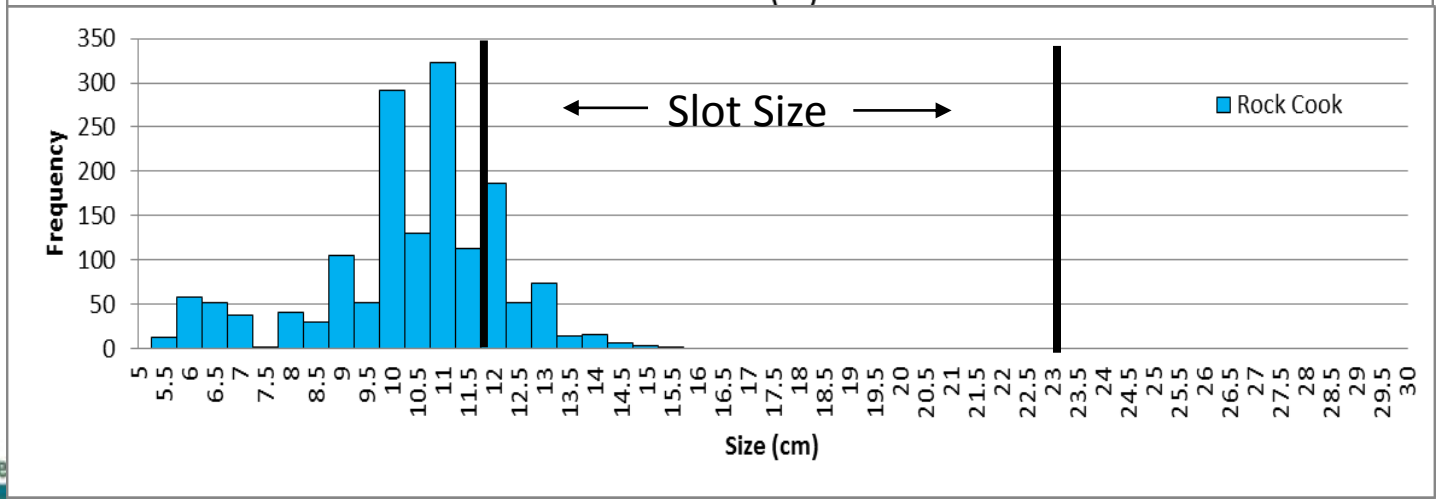
Spatial Catch Composition



Size Frequency Distributions







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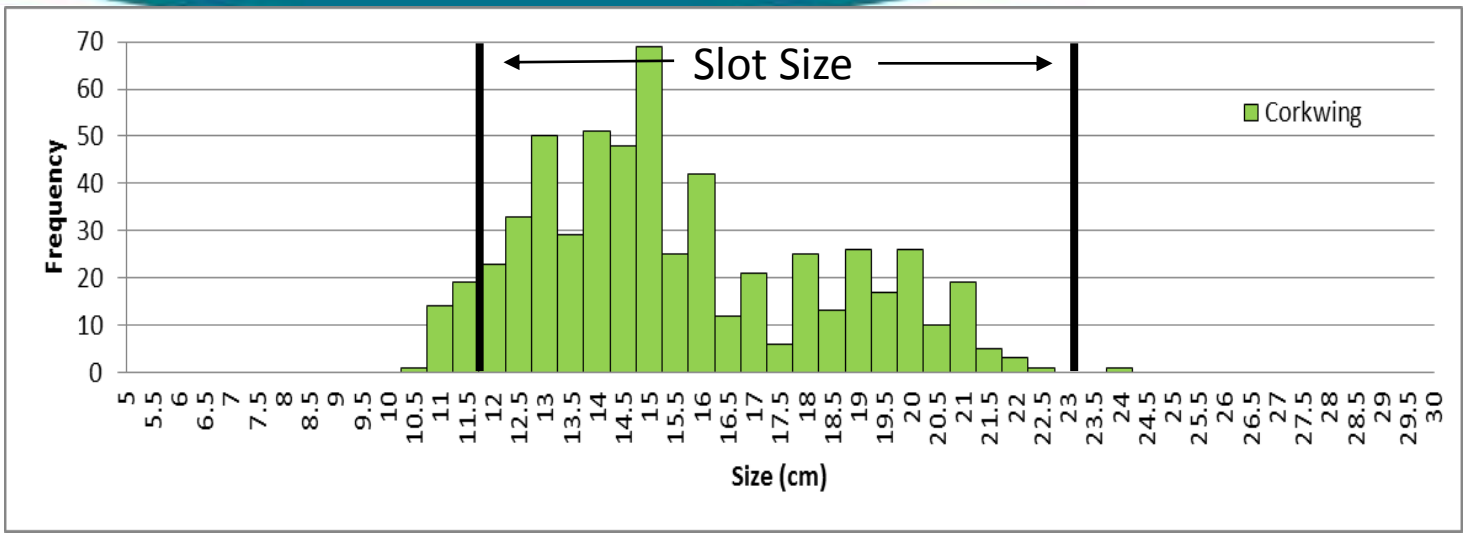
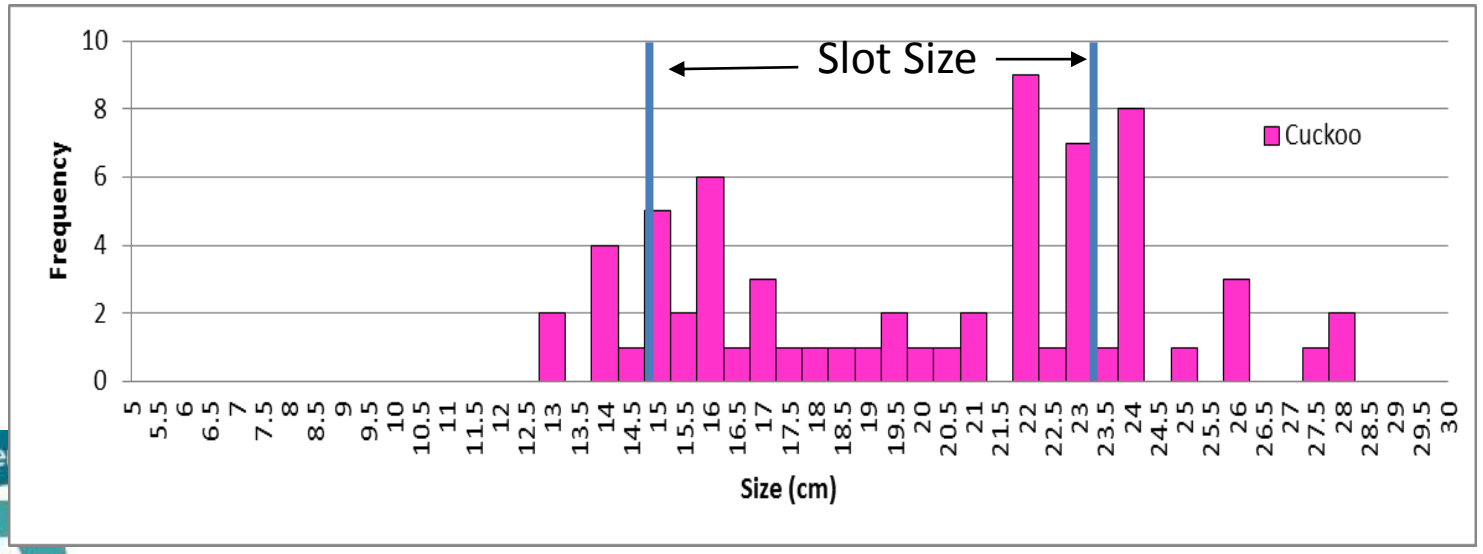
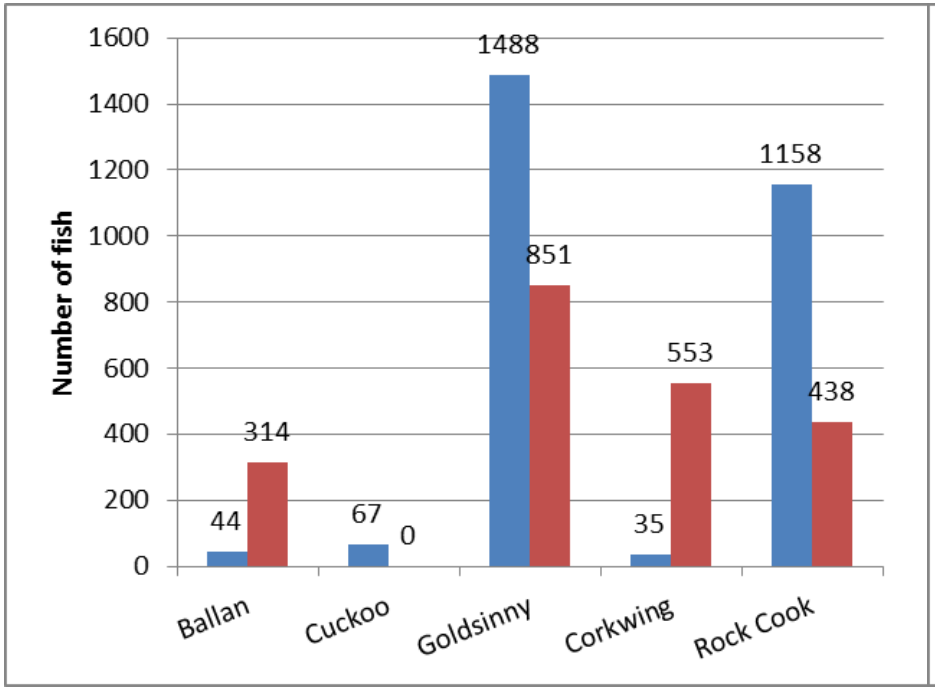
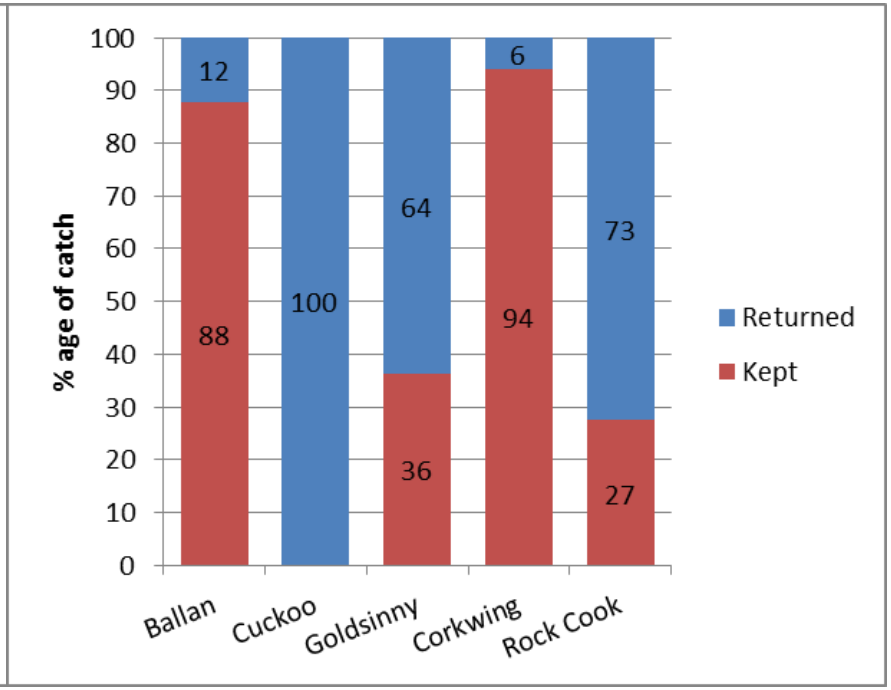
Size Frequency Distributions – Corkwing & Cuckoo Wrasse





Total Number of fish retained and returned – On- board surveys





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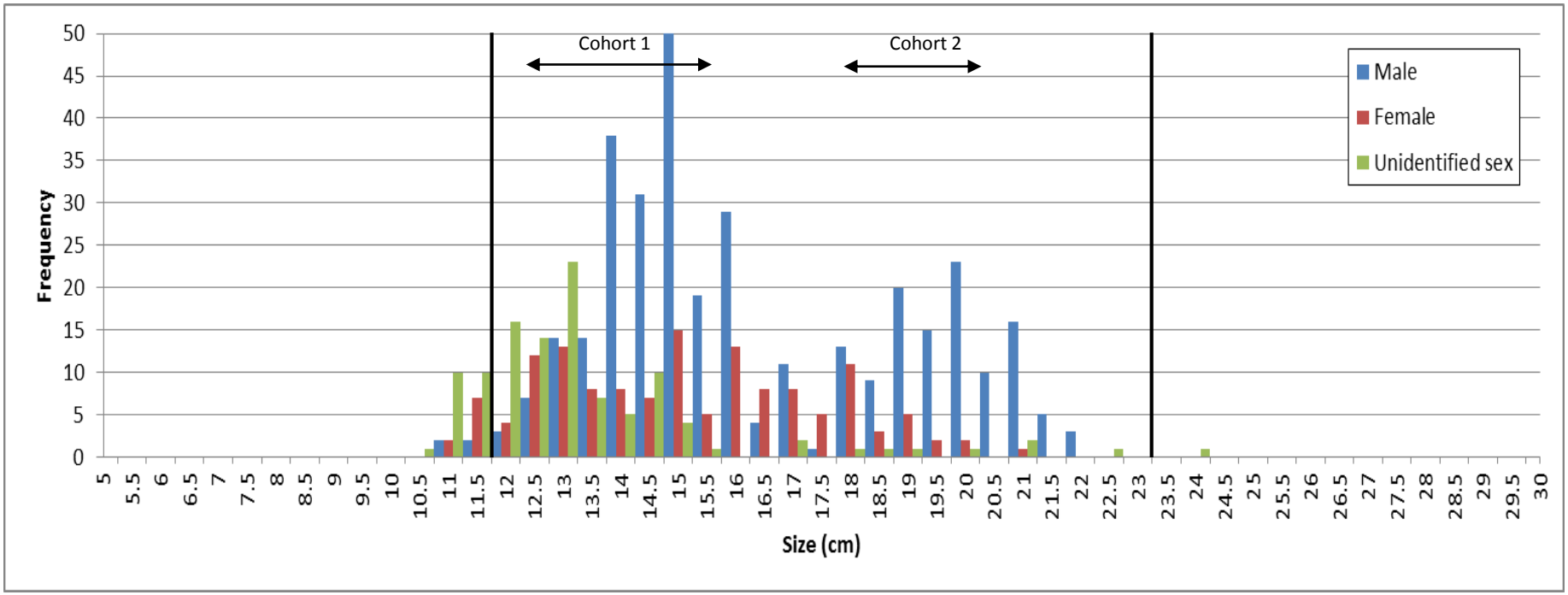
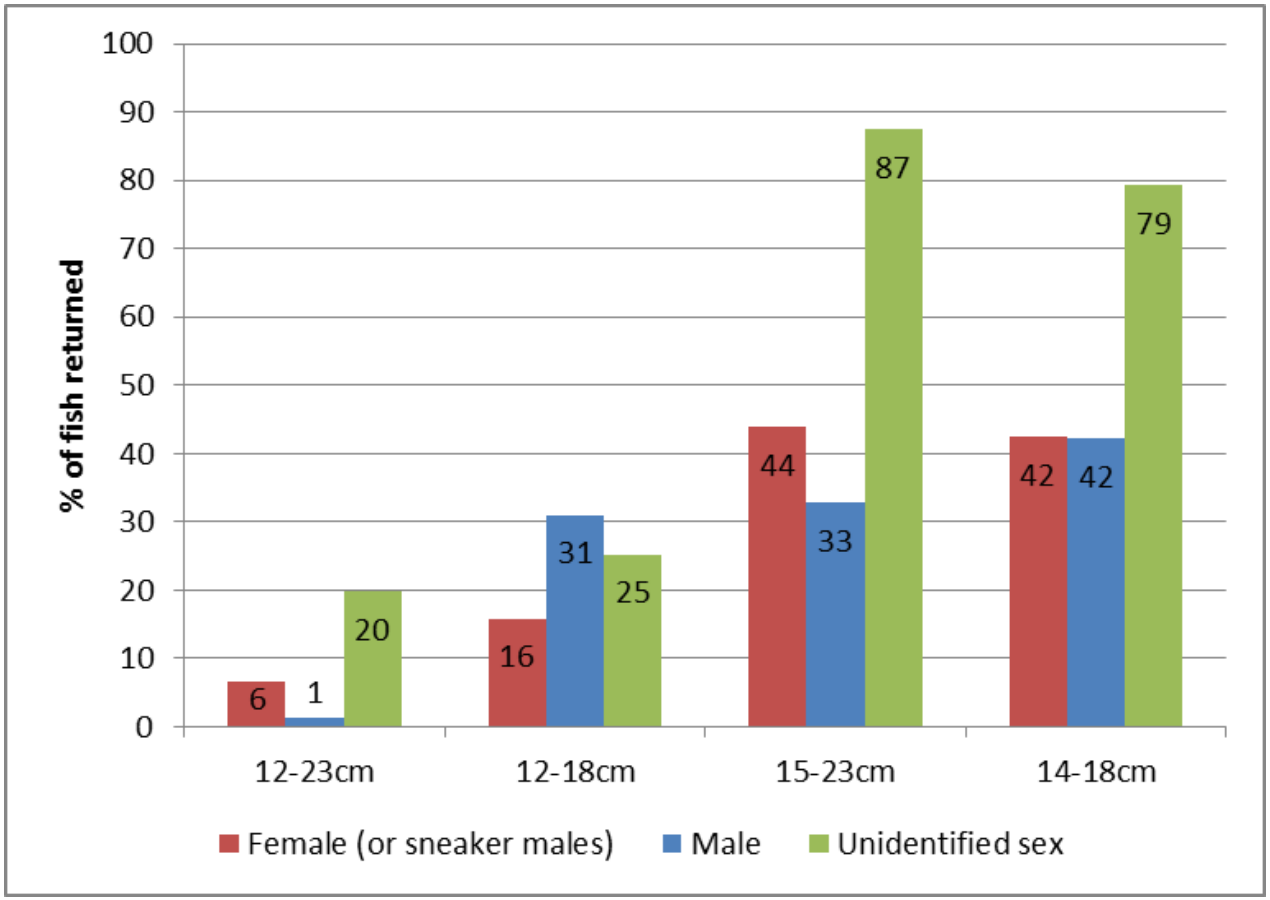
On- board surveys – Size distribution of corkwing wrasse by sex



Comparison of different Min and Max Conservation Reference Sizes on Percentage of Fish Returned



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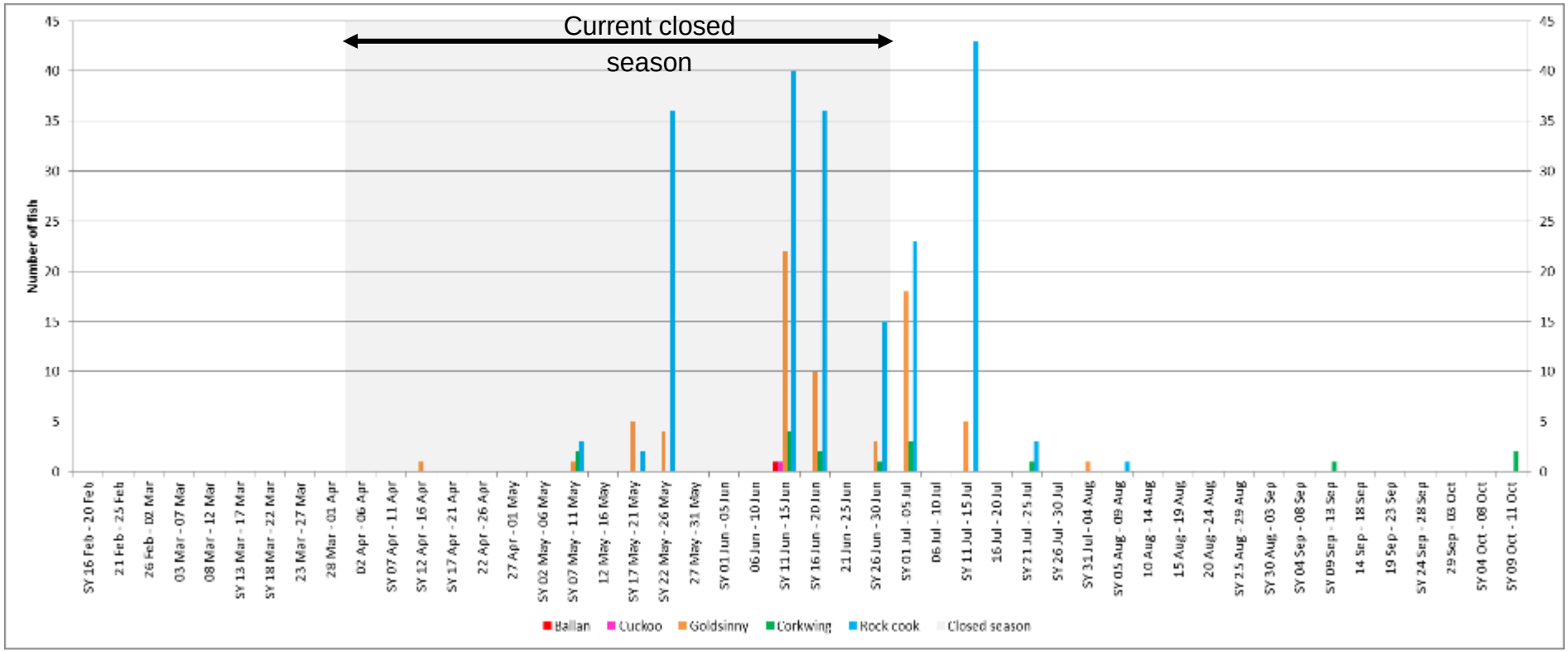
On-board surveys – Number of fish spawning



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Wrasse - Revised Management Measures

- Evidence collected then feeds directly into revised management
- Proposed change of corkwing minimum size to 140mm-160mm
- Proposed shift in spawning season closure (1st May -15th July) Consultation currently open until early March
- Meetings with fishermen to discuss results of the survey work and potential changes
- Also discussed Potential changes to voluntary closed areas suggested by fishermen
- Potential IVMS on vessels involved in the fishery
- Decision by byelaw sub-committee in April

MSc student – pot saturation/ catchability

PhD student – fisheries independent surveys (NE, Exeter University)

CIFCA research to complement D&S IFCA

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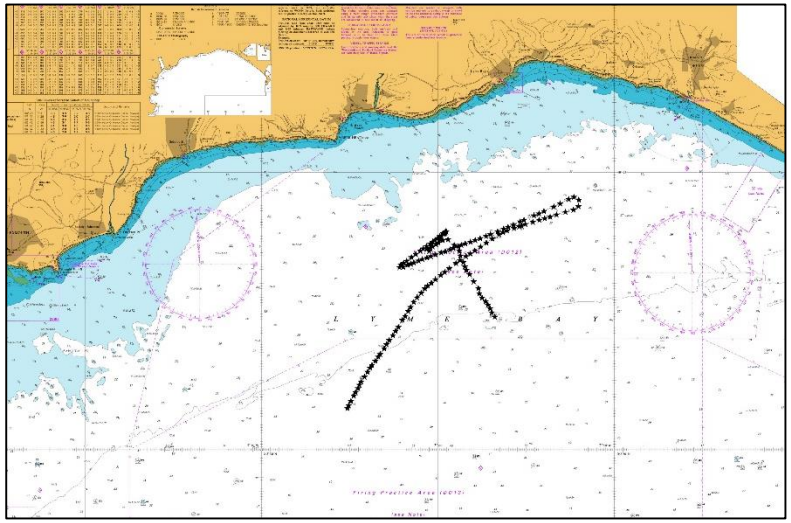
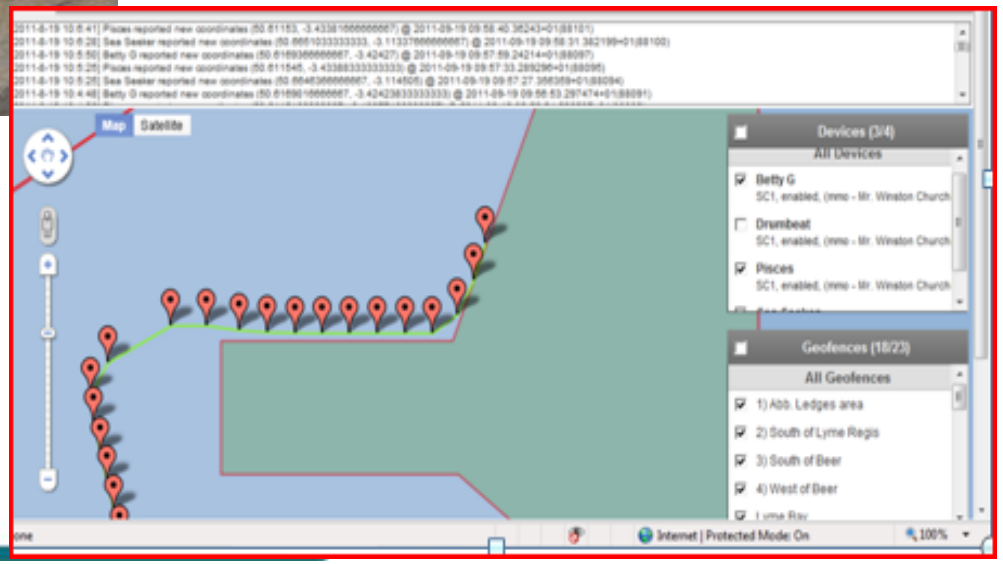
Voluntary Measures - Vessel Tracking System





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Participation with fishing industry
Data collection on-board surveys to inform sustainability of fishery
Fishermen helpful and supportive of on-board research
Sharing thoughts on parameters affecting the fish behaviour and ecology
Working jointly in response to poorly informed and critical petitions against the fishery
Working with industry to undertake further research in 2018
Fully documented fishery through collaboration
Allows a viable small scale fishery to continue
Joint dialogue with media
Voluntary management measures – introduced through communication
Smooth process with introducing management measures through permitting byelaws
Welcome collaboration between managers and fishermen
Fishermen open to meetings and discussions on potential changes in management
Two way process on fishery changes and concerns
Meetings with concerned stakeholders
Sharing ideas to improve survivability of discards