Devon & Severn IFCA

A Wrasse's Tale: Research & Management

Sarah Clark
Deputy Chief Officer

Live Wrasse Fishery 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 in SW
- Immediate interest from NGOs, Angling Trust, media etc.

What does the Wrasse Fishery look like?

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Wrasse Species

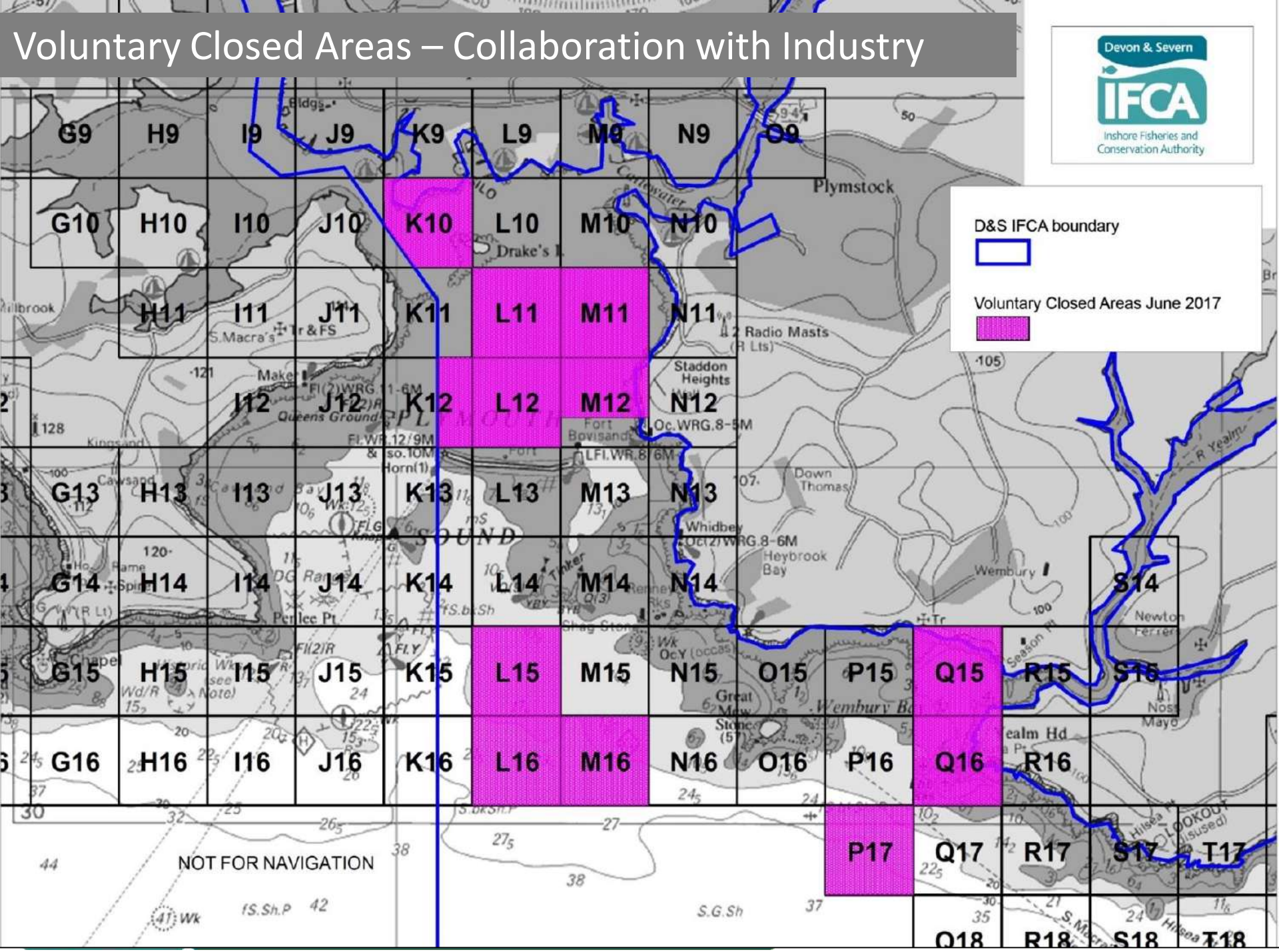
Ecology & Biology	
Distribution	Mediterranean to English Channel to West Baltic Sea
Habitat	inshore rocky reefs, kelp forests and seagrass beds. Territorial – 2m^2 to 50m$^{2.}$ Mostly shallow water <10m for smaller spp and often in MPA
Diet	molluscs and crustaceans – cleaner fish, grazing on seaweeds and rocks
Activity	diurnal and seasonal – hibernate in winter <7°C or move into deeper water
Sizes	ballan up to 60cm, cuckoo 35cm, rock cook to 15cm, goldsinny ~ 15cm, corkwing <25cm
Reproduction	Different strategies for different spp. Dominance hierarchy for Ballan and cuckoo. Males grow faster, harem of females
Spawning	April to September. Most species have benthic eggs (apart from goldsinny) & males provide care/guard nest
Size at Sexual Maturity	Ballan M-28cm F-16/18cm; Cuckoo M-24cm F-16cm; goldsinny 9.5cm; corkwing 10cm; rock cook 9cm
Sex change	ballan, cuckoo (Blue Planet)
Sneaker males	goldsinny, corkwing – steal fertilisation opportunity by mimicking females

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

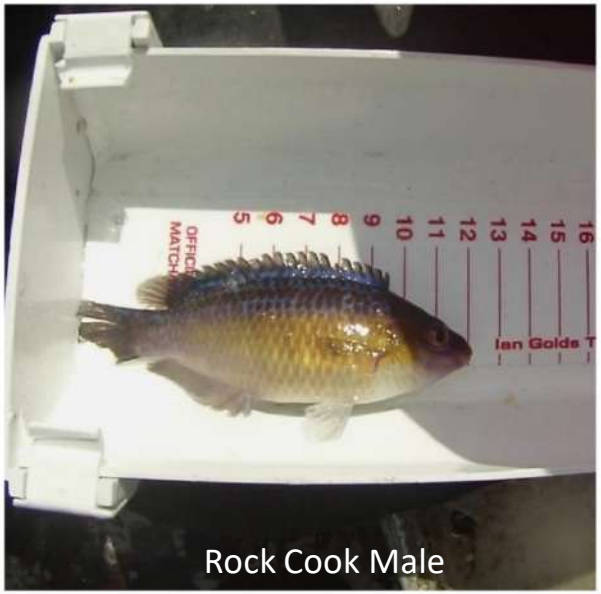
Species	Minimum Size- cm	Maximum size -cm
Ballan	15	23
Cuckoo	15	23
Corkwing	12	23
Goldsinny	12	23
Rock Cook	12	23

Voluntary Closed Areas – Collaboration with Industry

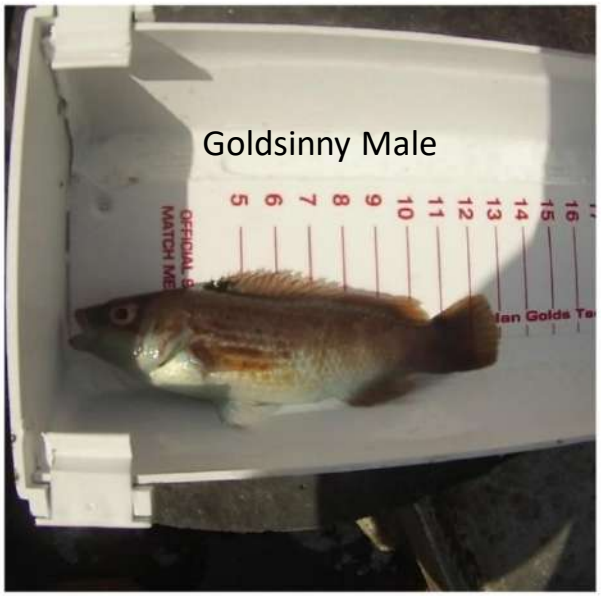


D&S IFCA Survey Work

- 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 CPUE & LPUE and location
- Sharing data with CIFCA


Rock Cook Male


Rock Cook Female


Goldsinny Male


Goldsinny Female

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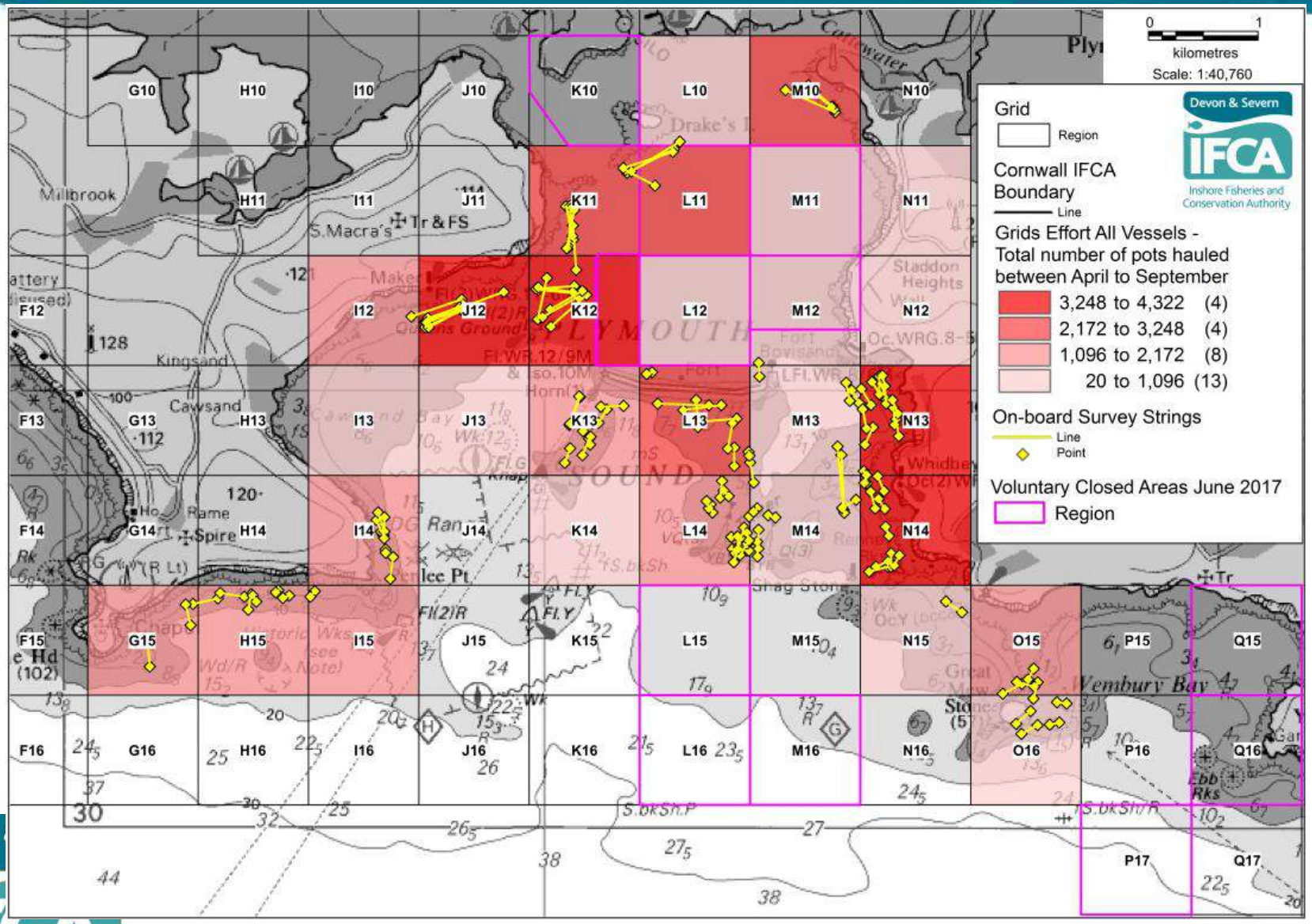
Spatial Effort – On-board Surveys and Fishermen's returns



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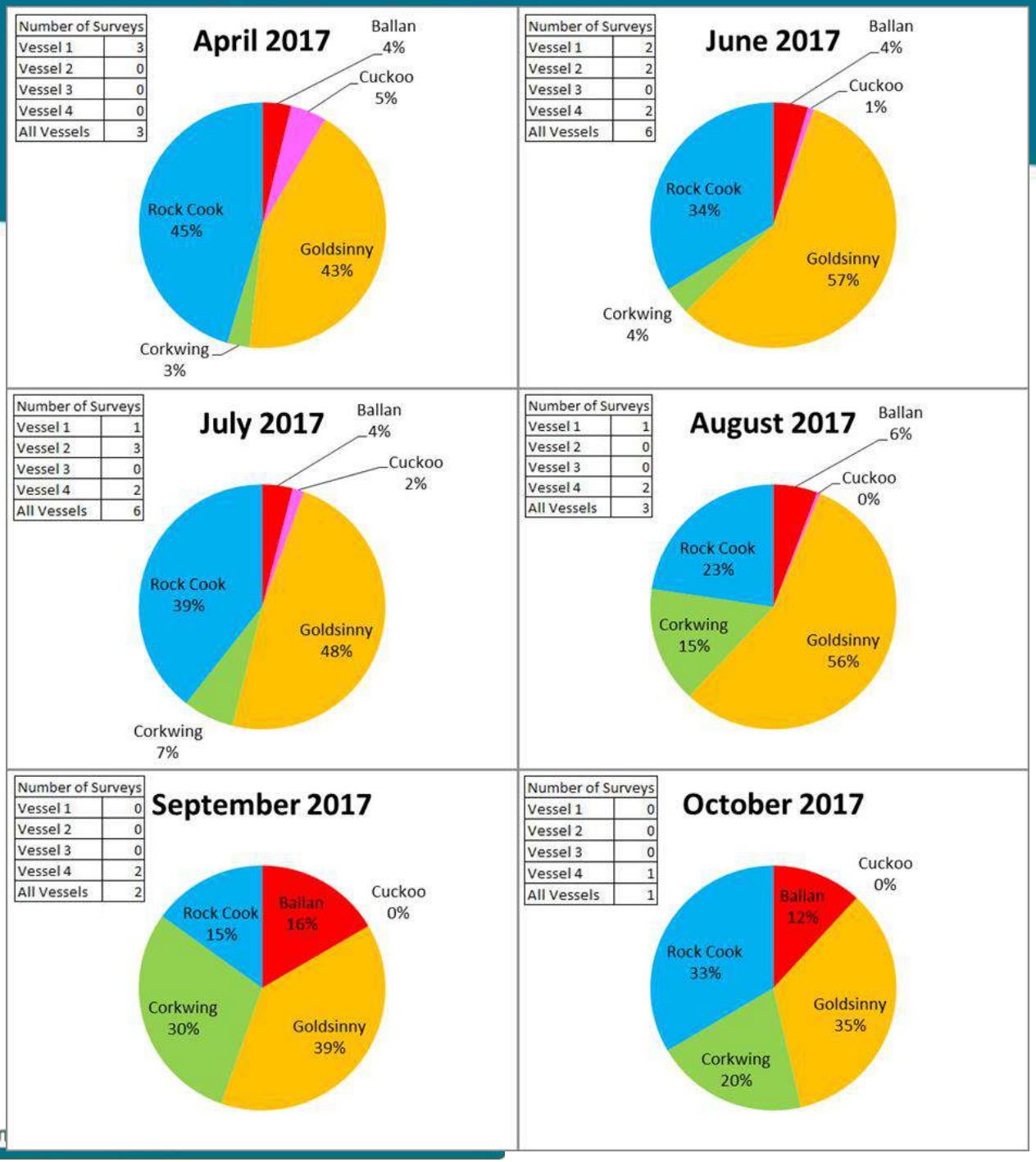
Monthly Catch Composition

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



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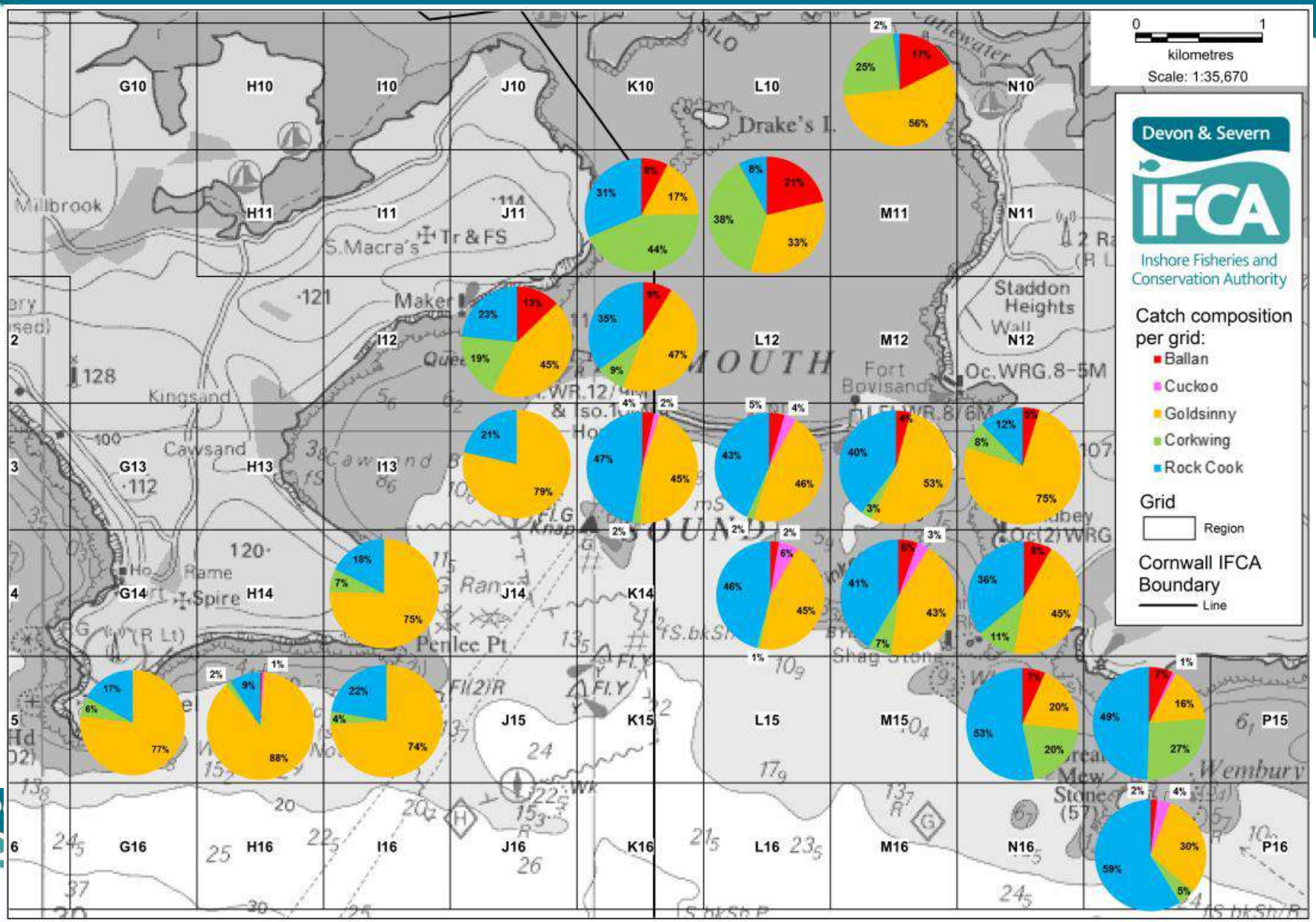
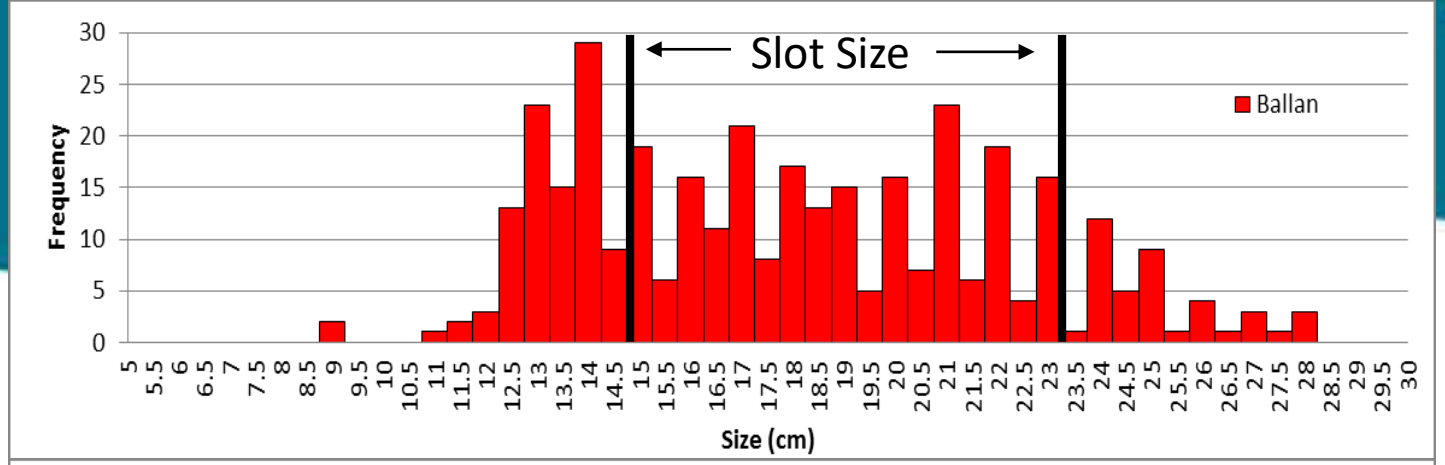
Spatial Catch Composition

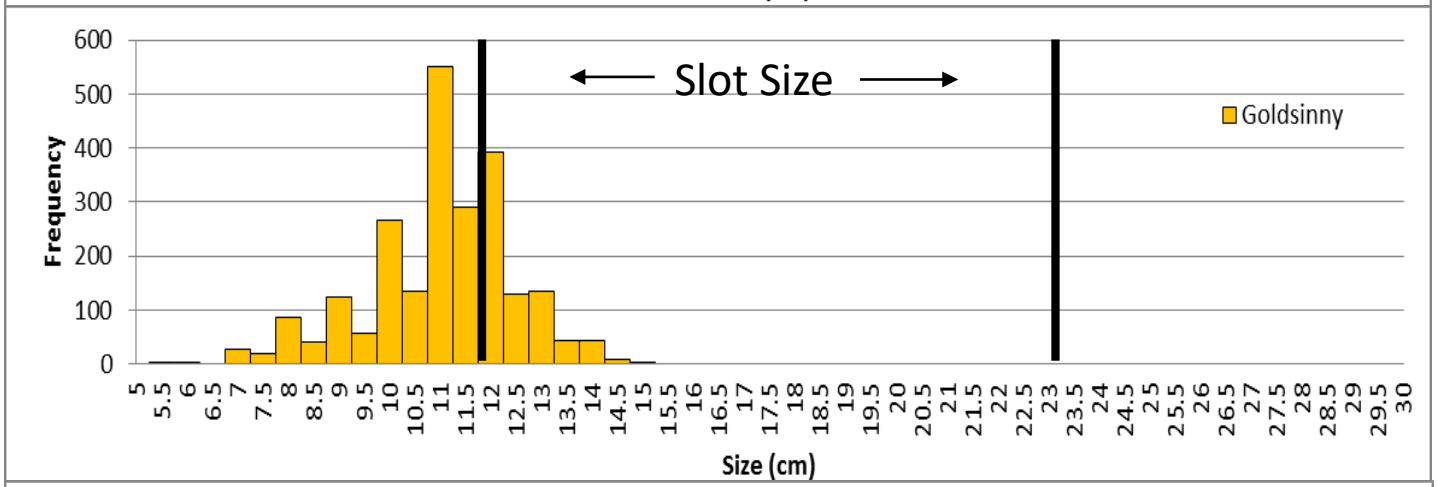


Size Frequency Distributions

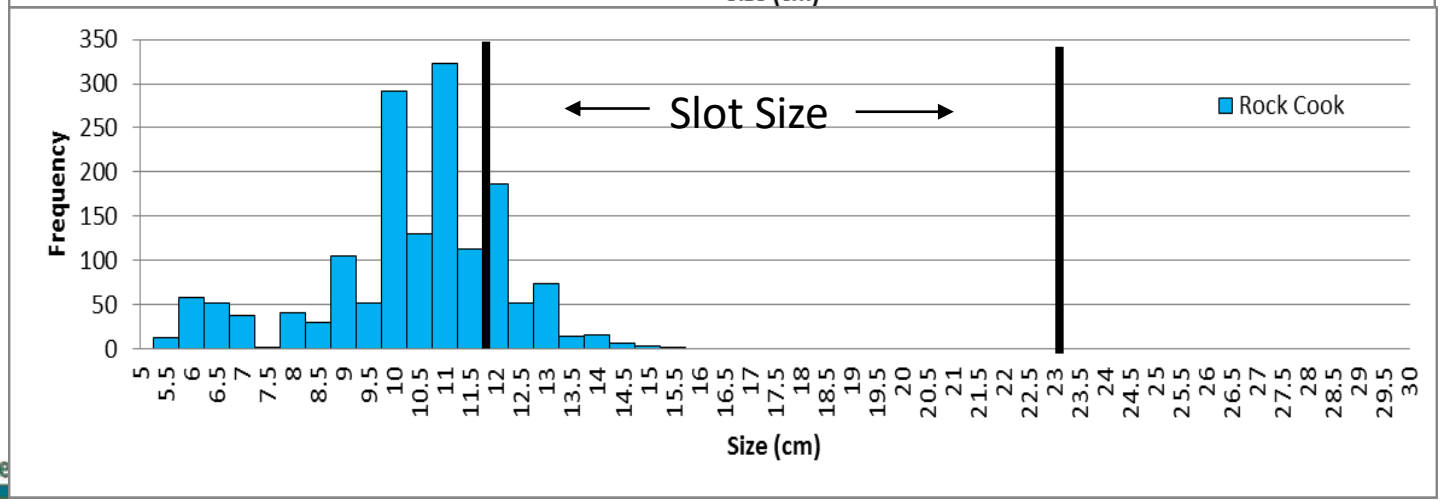
Ballan



Goldsinny



Rock Cook



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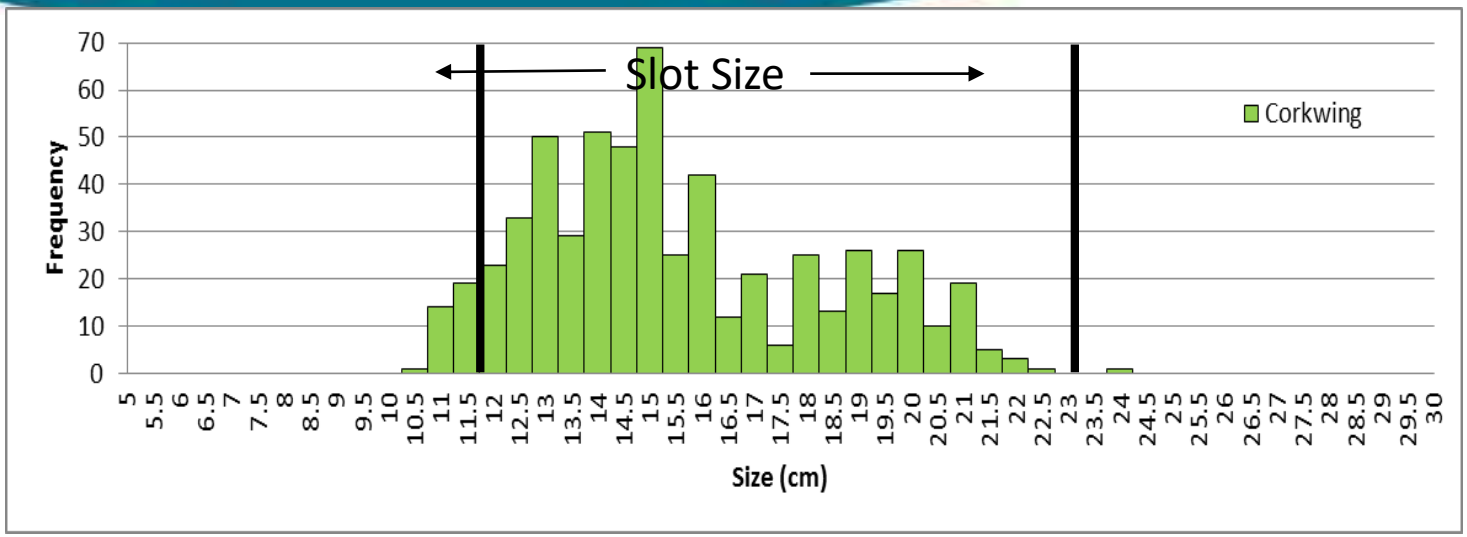
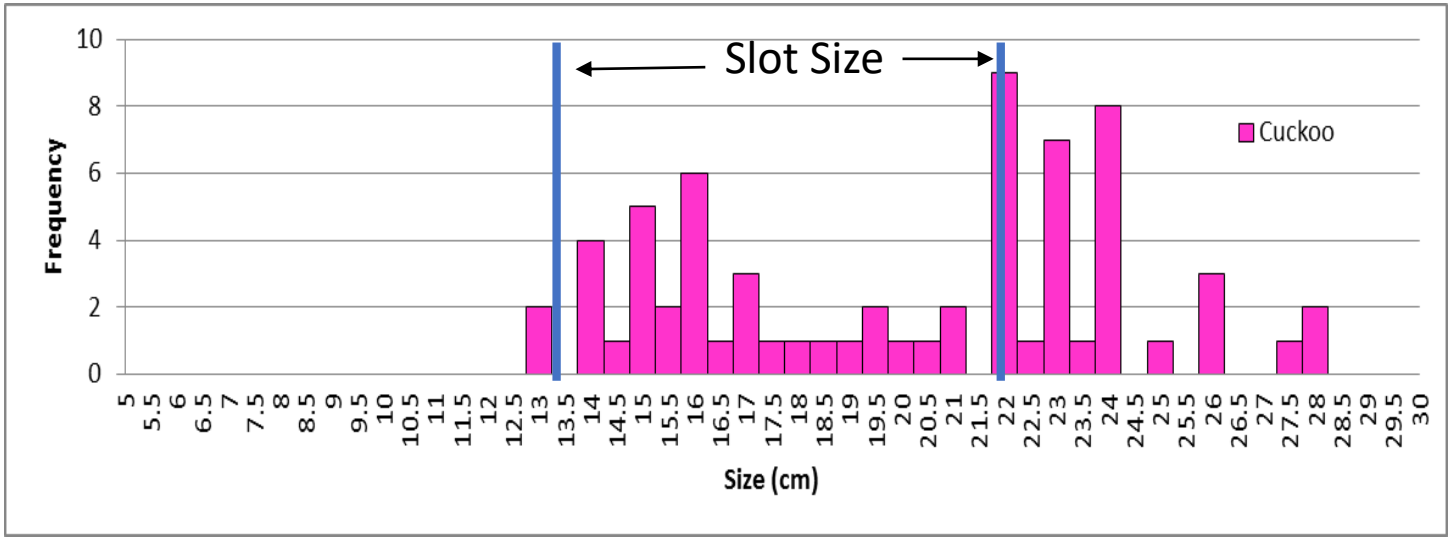
Size Frequency Distributions – Corkwing & Cuckoo Wrasse

Corkwing



Cuckoo



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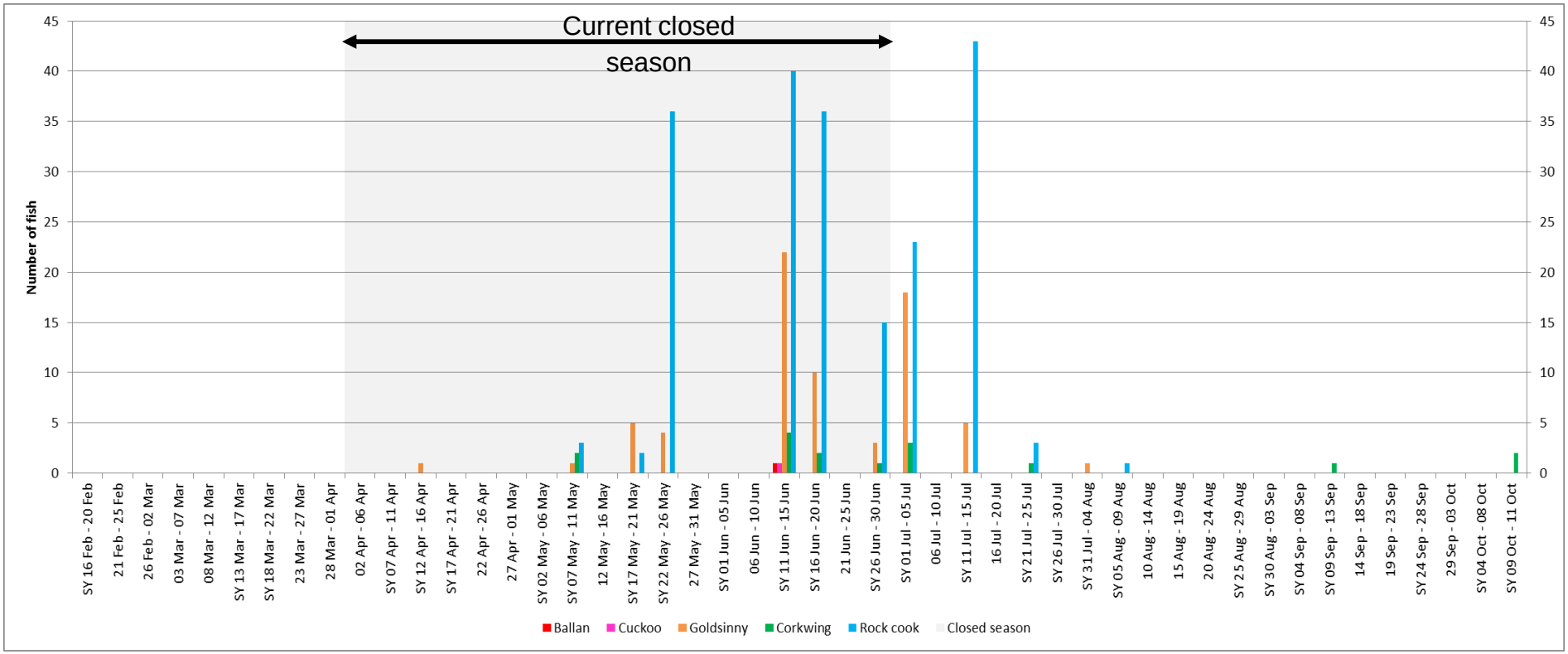
On-board surveys – Number of fish spawning



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Changes to Management Measures

- Evidence collected feeds directly into management – revised permit conditions
- Proposed change of corkwing minimum size to 140mm-180mm
- Proposed shift in spawning season closure (1st May -15th July – potentially for 2019 season)
- Meetings with fishermen to discuss results of the survey work and proposed changes
- Potential changes to voluntary closed areas suggested by fishermen
- Potential IVMS on vessels involved in the fishery

Research 2018

- Continue on-board surveys
- MSc student – pot saturation/ catchability - 2018
- PhD student – fisheries independent surveys (NE, Exeter University) – starts 2018
- CIFCA research to complement D&S IFCA

Thank you

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Lasers and *Labridae* in Lyme Bay

What can we learn about wrasse territoriality from their laser-chasing behaviour?

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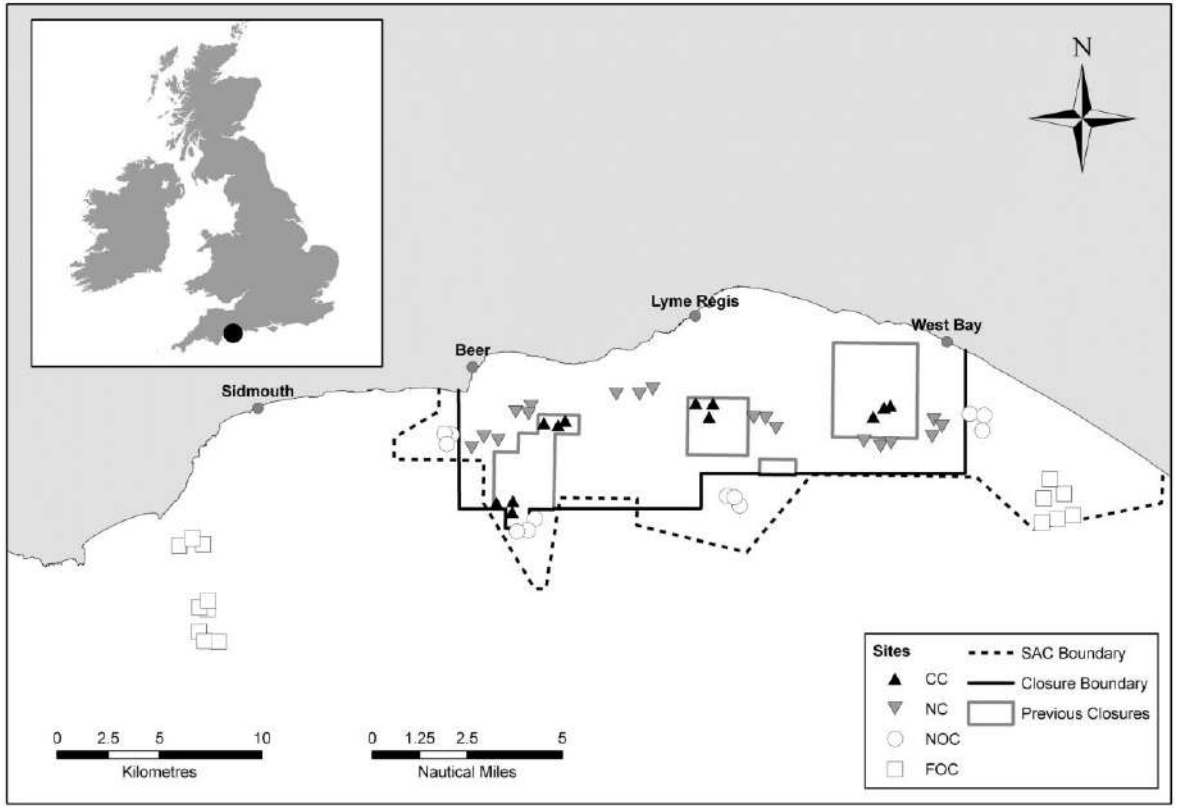
Study site: Lyme Bay Reserve

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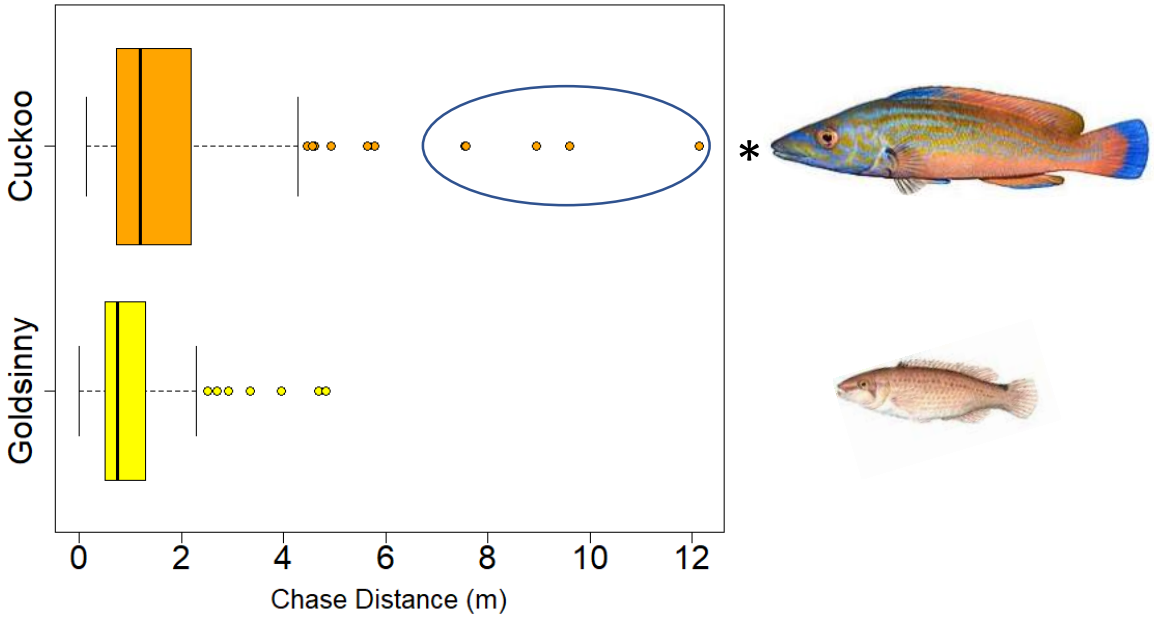
Aim: to explore aspects of wrasse territoriality using an observed behaviour, “laser chasing”

- Objective 1: Are there differences in the likelihood of ‘laser chasing’ between species, sizes and sexes? Are there relationships between the length of chase and wrasse species/sex/size?
- Objective 2: Can we use this behaviour to answer questions about aggression and territory size?
- Objective 3: Are there implications for wrasse conservation, management and welfare?

How do different wrasse species interact with towed apparatus?

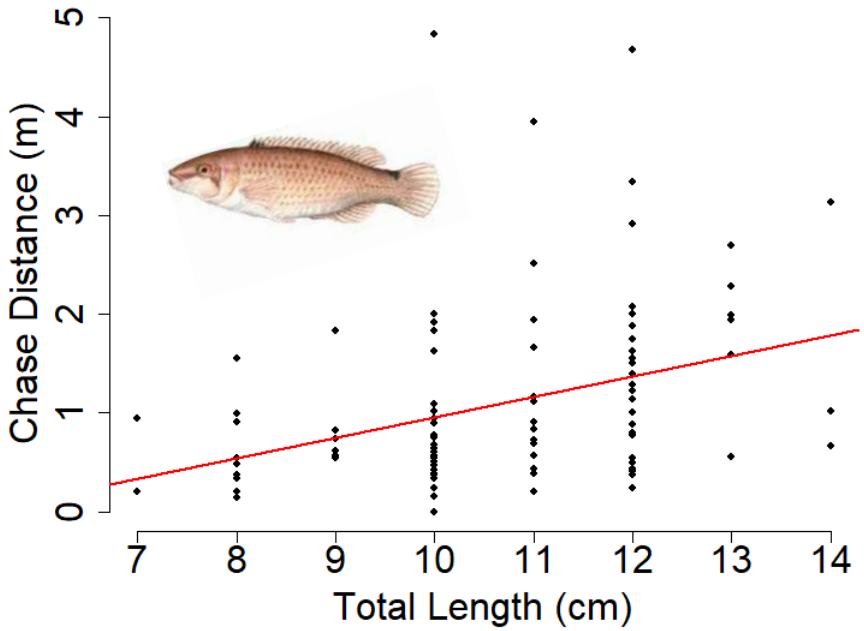
- Cuckoo Wrasse more likely to ‘chase’ the laser than Goldsinny
- Cuckoo Wrasse chase distances significantly greater than Goldsinny chase distances



Permutation test: $p > 0.001$. Mean Goldsinny Chase: 1.04m, 95%CI 0.89-1.21m. Mean Cuckoo Chase: 1.83m, 95%CI 1.51-2.18m

Are larger wrasse more territorial?

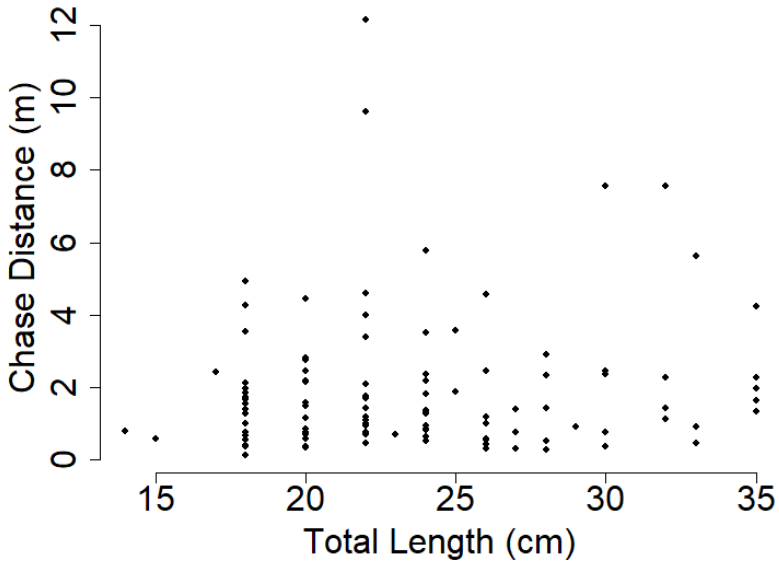
- Goldsinny Wrasse: larger wrasse tended to make longer chases



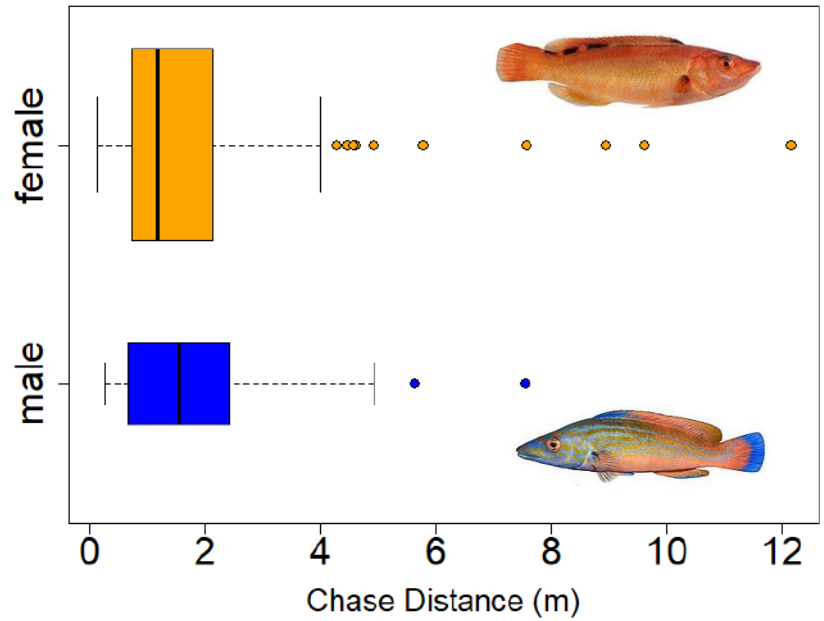
Spearman's rank: r_s=0.41, $p < 0.01$, n=104

Are larger wrasse more territorial?

- Cuckoo wrasse: no apparent relationship between length and chase-distance, or sex and chase-distance



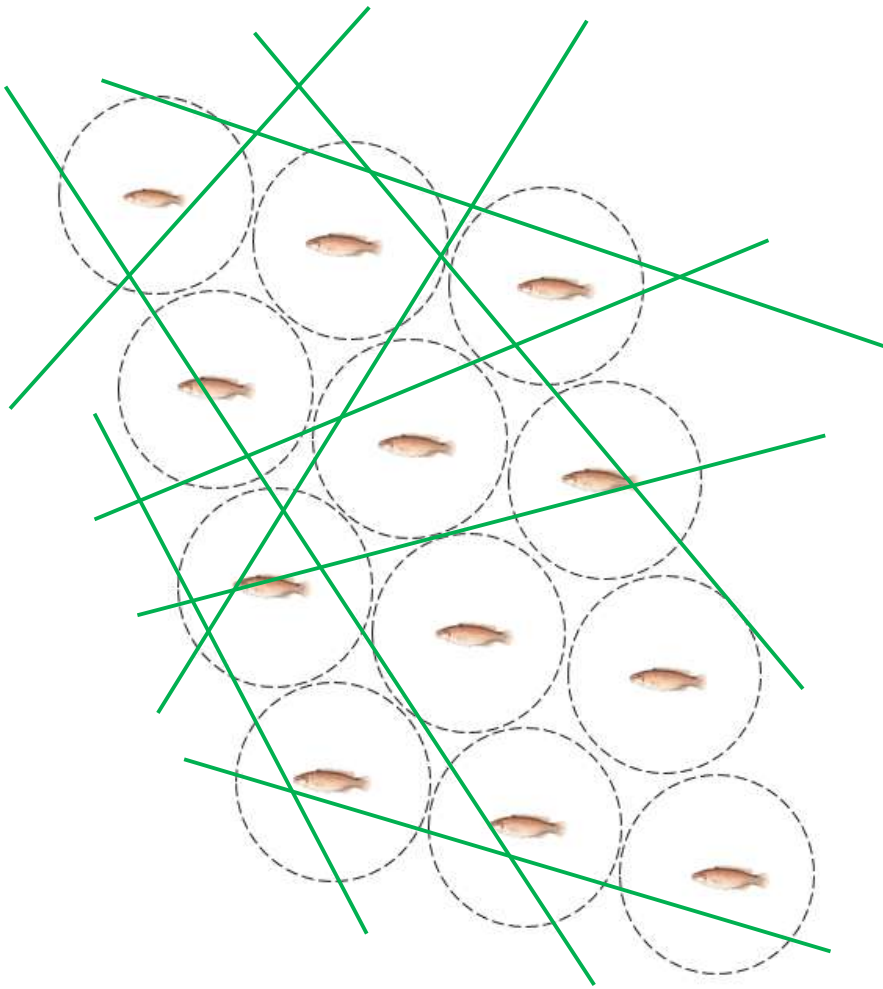
Spearman's rank: $r_s = 0.07$, $p = 0.45$, n=120



Permutation test: P=0.43, n=120

Territory size

- Assumptions: landscape of circular territories of radius *r*, ($A = \pi r^2$)
- Average intersection of random lasers = *r*
- Goldsinny: median chase distance = 0.8m, gives 2m^2 territory size, (max chase = 5m, gives 19m^2 territory size)
- **Hilden (1981)** directly observed Goldsinnies had an average territory size of 1.4m^2, (range 0.5-2m^2)
- Cuckoo wrasse: median chase distance was 1.4m, gives 6.2m^2 territory size (max chase, 75m^2 territory)



Further questions

- Apply method to different situations
- Are wrasse territorial toward laser at different times of year?
- Are there differences in territoriality between fished/unfished areas?
- Are we selecting against behavioural traits by fishing?
- Does territoriality/territory size vary with habitat type? Eg. wrasse in inshore kelp forests?

Questions, please!

Acknowledgements

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References

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