Will a native predator help to control novel, range-extending urchins on temperate reefs in Tasmania?

Jennifer Smith

John Keane, Craig Mundy, Caleb Gardner & Michael Oellermann

IMAS
INSTITUTE FOR MARINE & ANTARCTIC STUDIES

UNIVERSITY of TASMANIA

FRDC

ECOLOGICAL SOCIETY OF AUSTRALIA

Abalone Industry Reinvestment Fund

Southern Rocklobster LIMITED

11%
barren

37%
arren

1%
arren

%
en

15%
barren

20%
arren

22%
barren

5%
arren

3%
barren

0%
barren

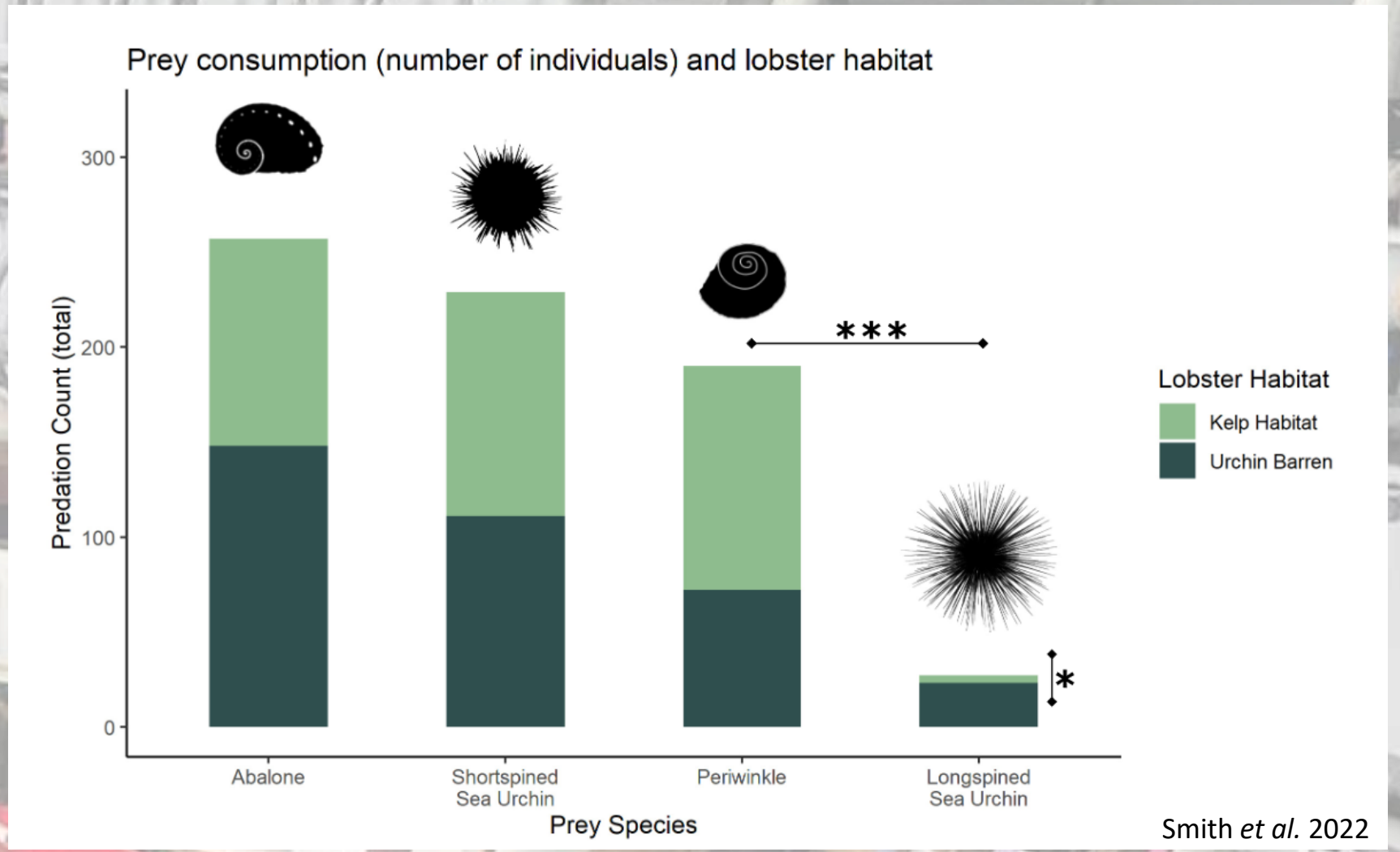
12 SOUTH BRUNY

13 RECHERCHE

0%
barren

Lobster prey preference experiments

Lobster prey preference experiments



Smith *et al.* 2022

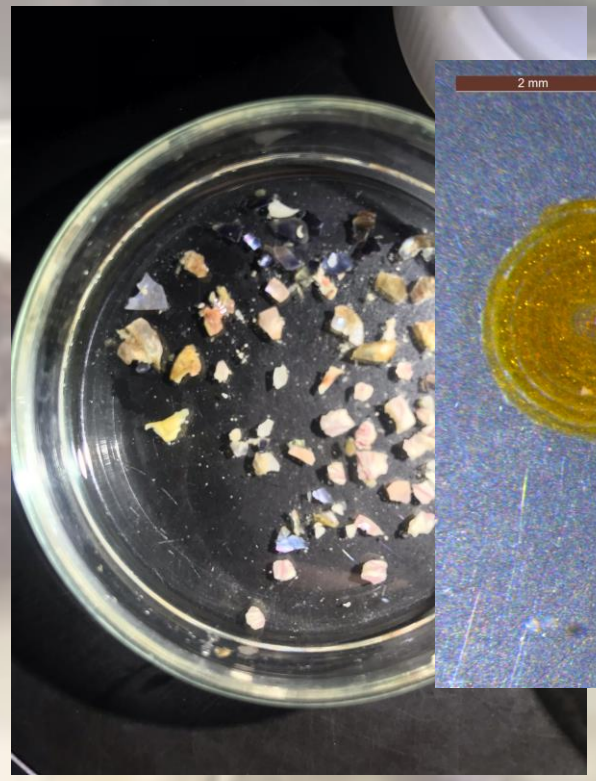
Lobster diet in the wild

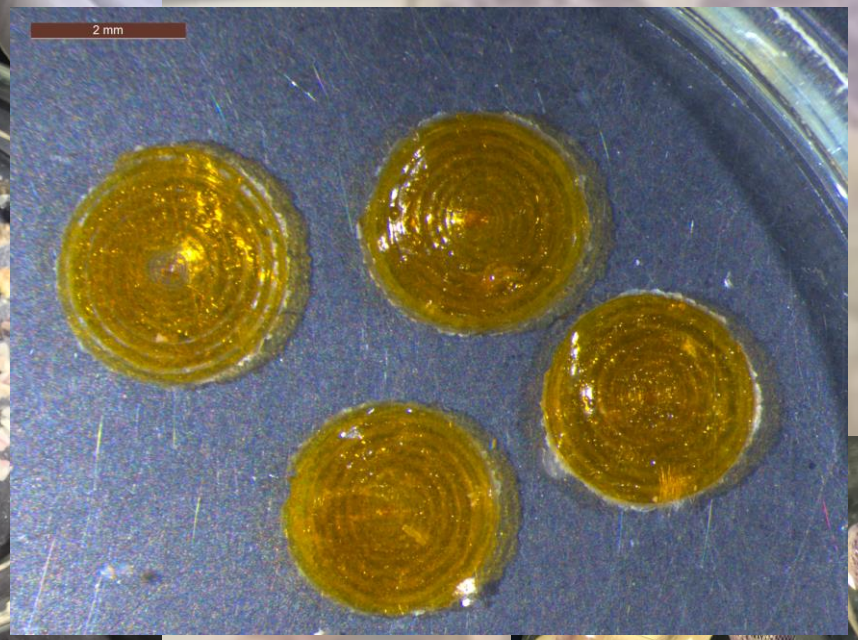
36 lobsters from **4 sites** = **144 lobsters**

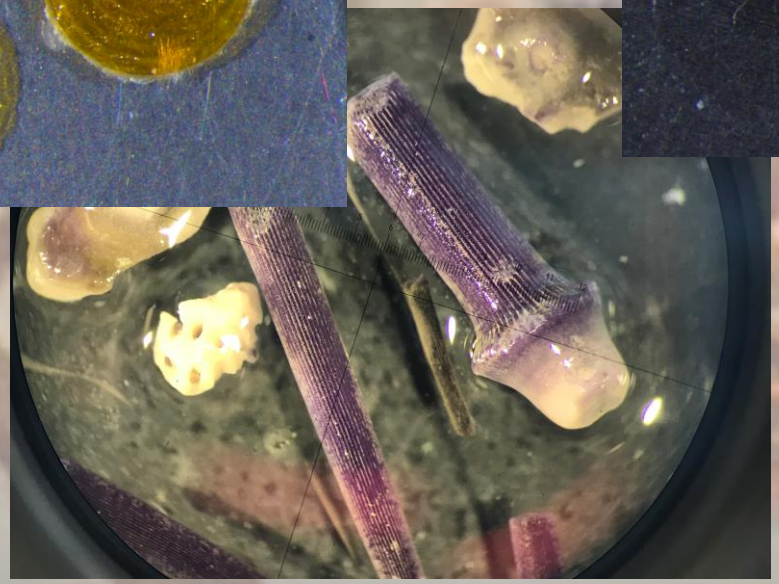
Methods comparison

Method	Individual prey detection	Non-lethal	Long term	Quantitative (population level)	Major Cons
Faecal samples (DNA)	✓	✓	✕	✓	Low quality DNA in faecal matter
Stomach contents	**Sometimes**	✕	✕	✓	Requires expert ID skills
Stable isotope analysis	**Sometimes**	✓	✓	✓	Difficulty surveying <u>entire</u> possible diet

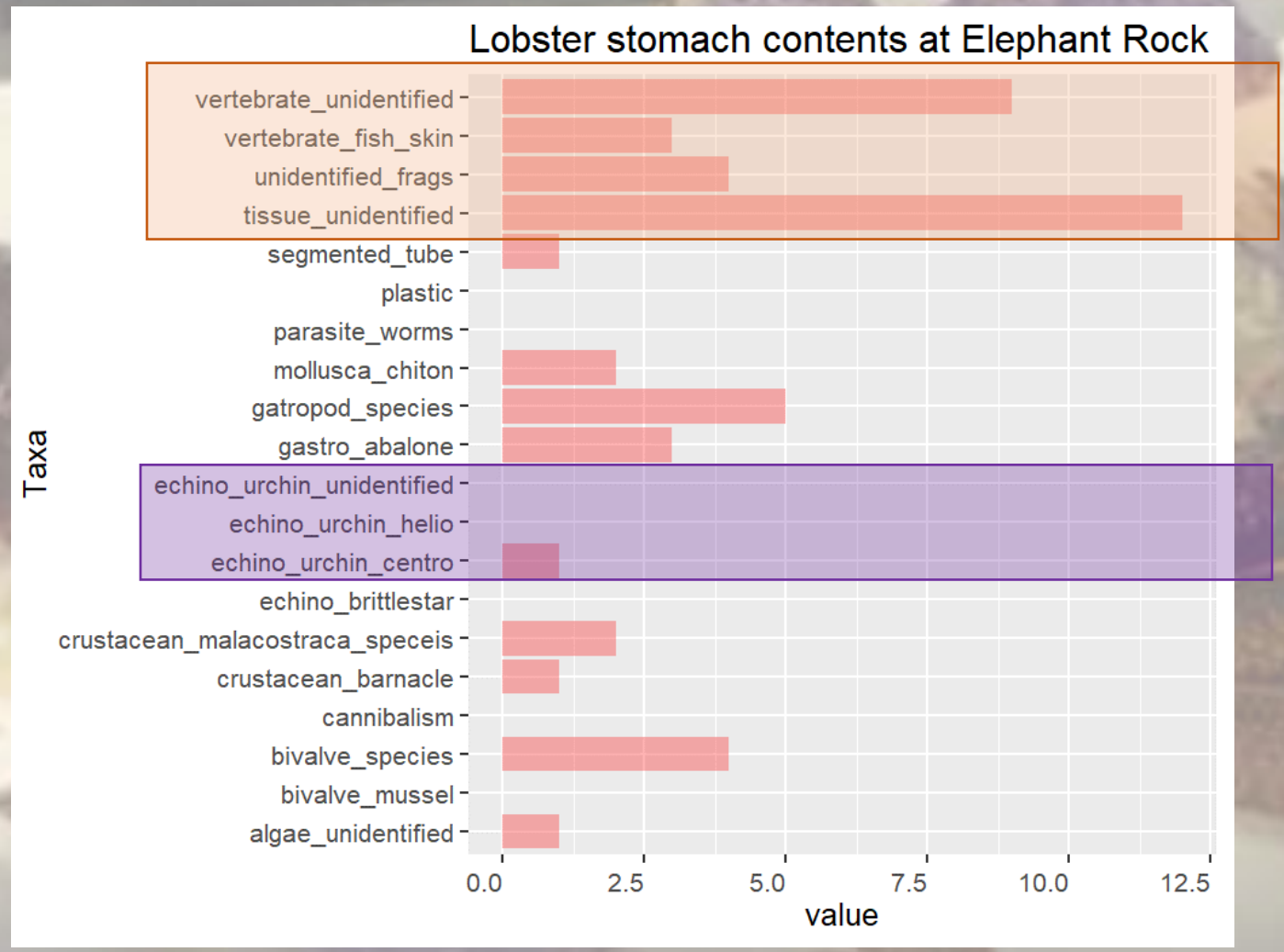
Stomach contents analysis

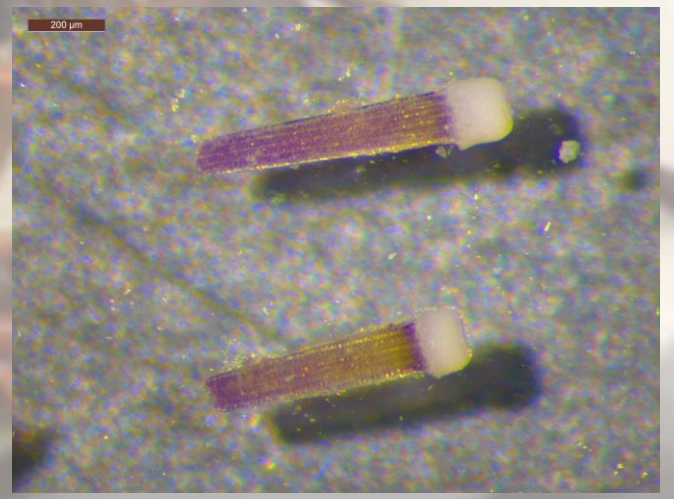




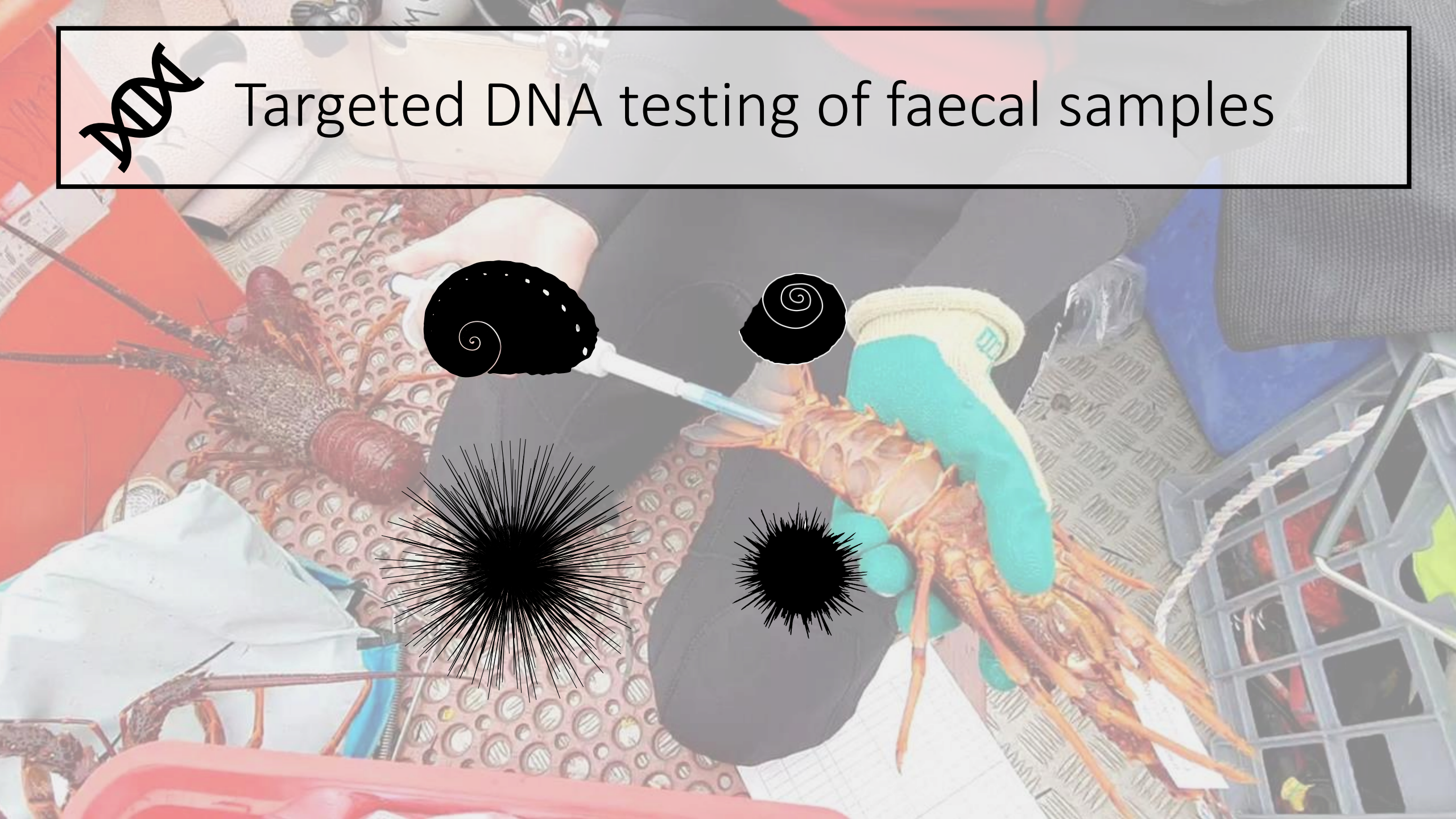


Stomach contents analysis

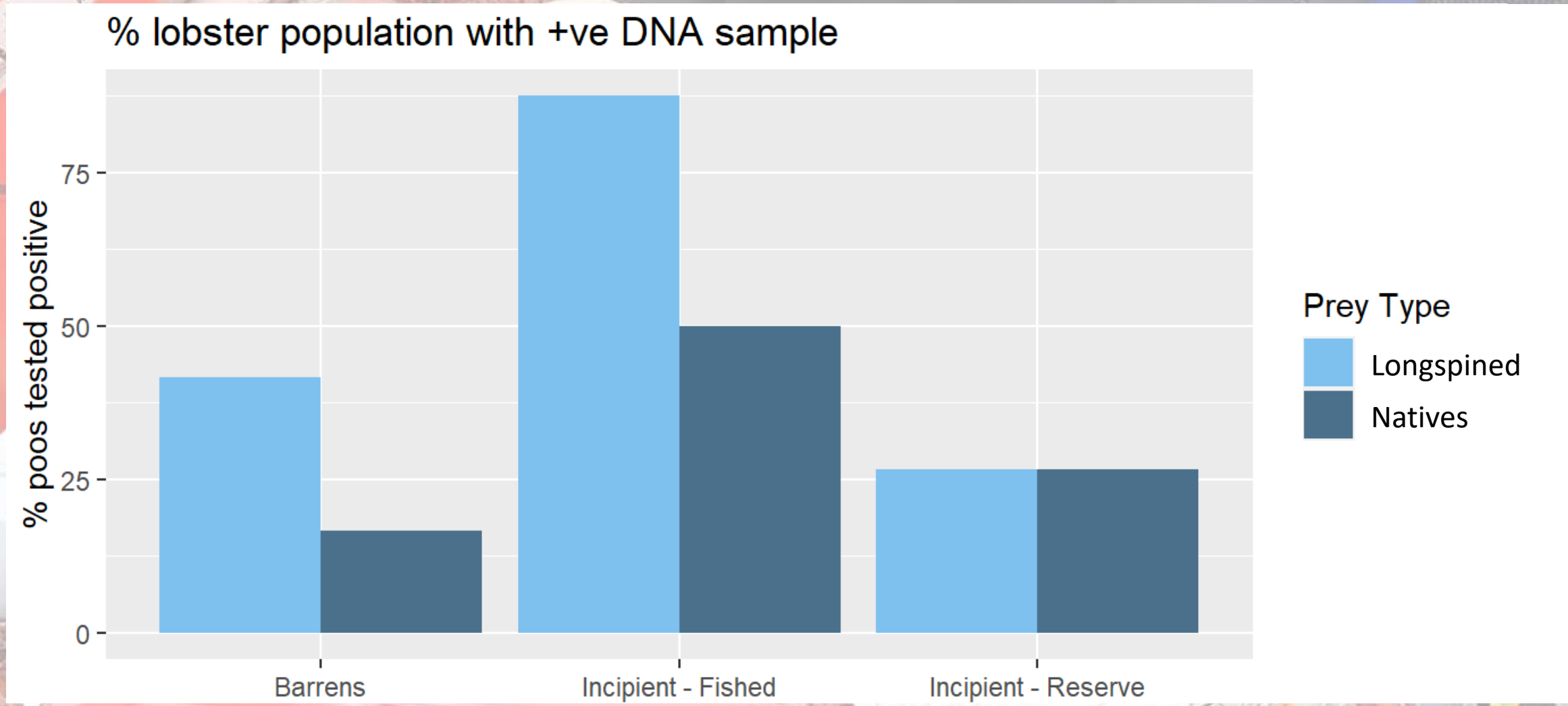




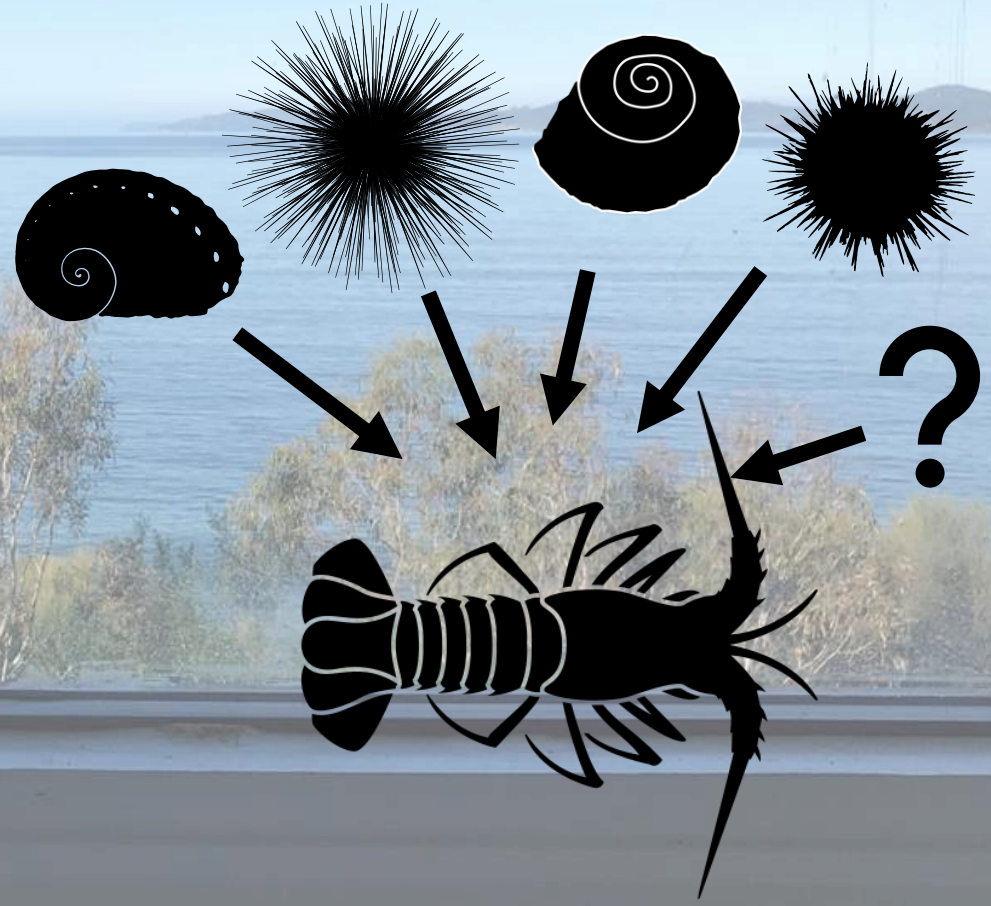
Targeted DNA testing of faecal samples

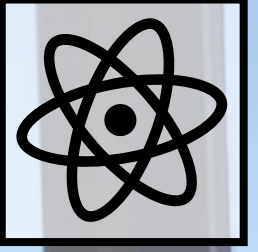


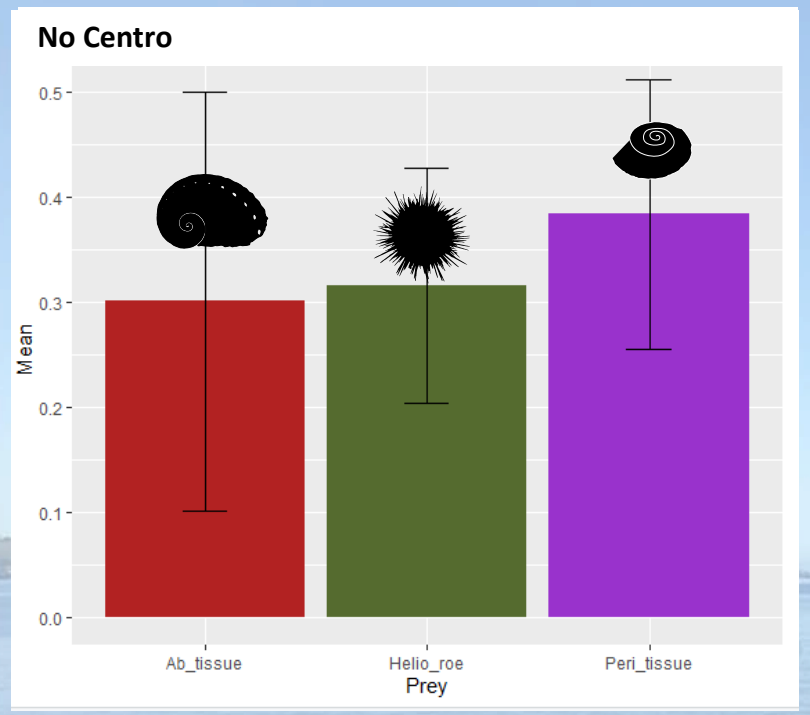
Targeted DNA testing of faecal samples

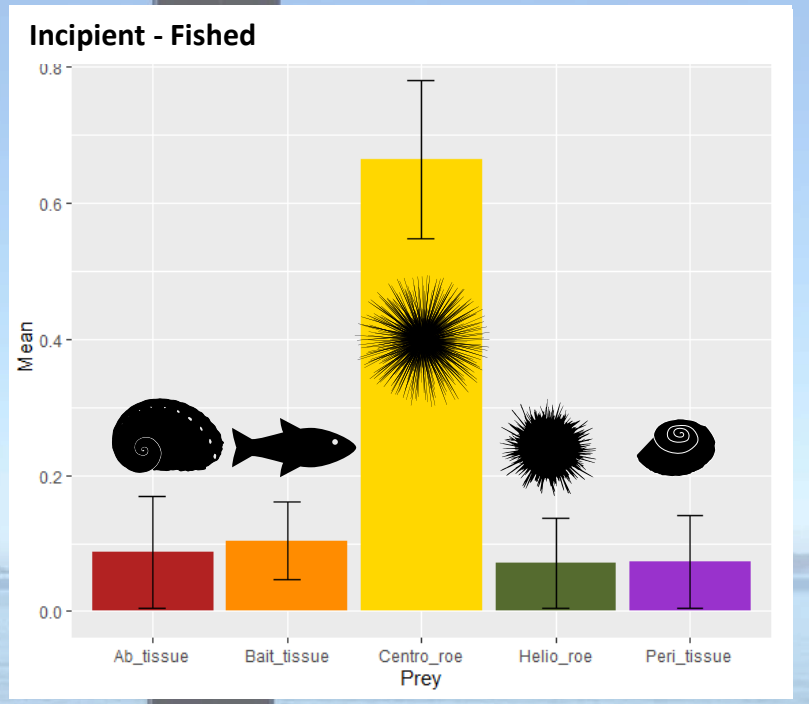


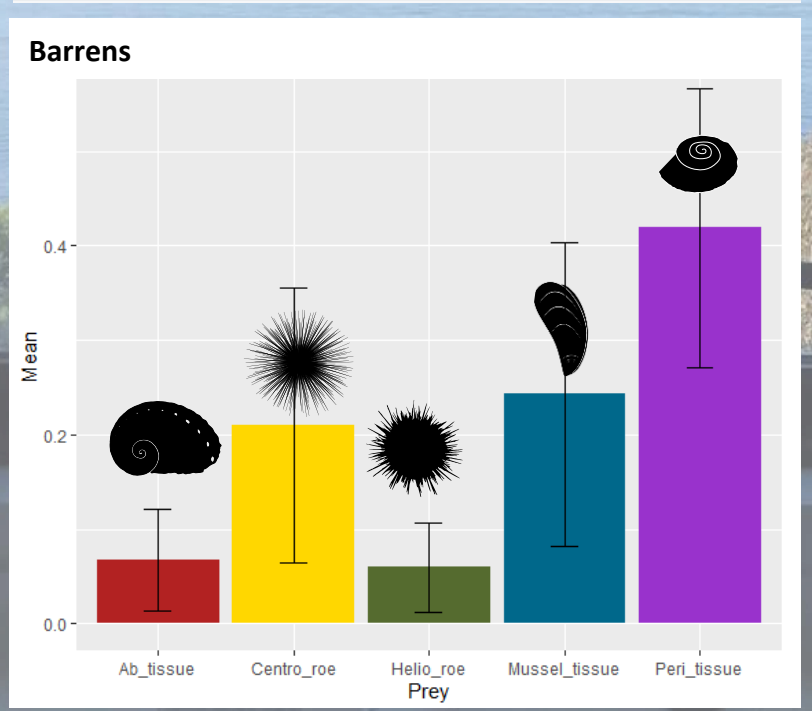
Stable isotope analysis

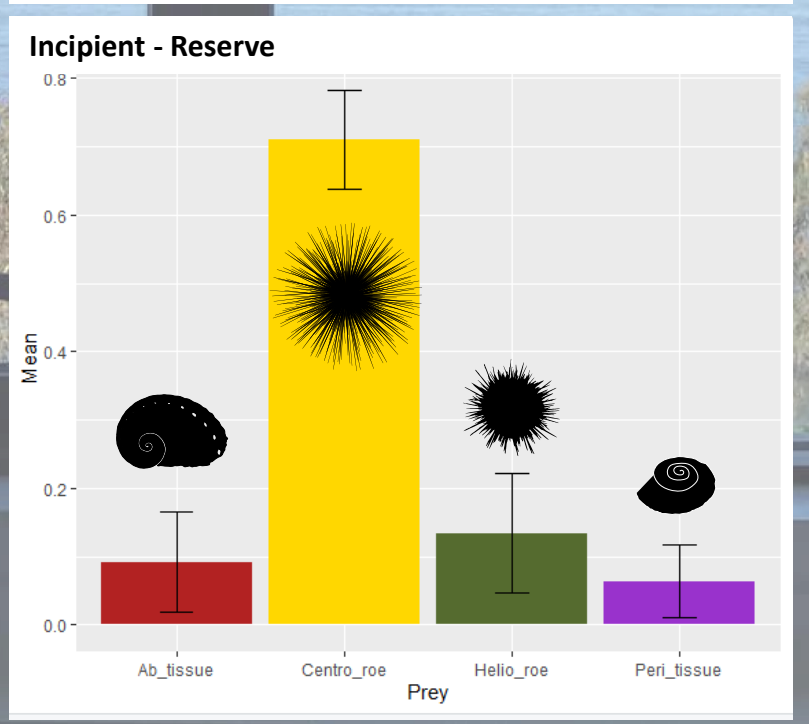





No Centro
Mean
0.0
0.1
0.2
0.3
0.4
0.5
Ab_tissue
Helio_roe
Peri_tissue
Prey


Incipient - Fished
Mean
0.0
0.2
0.4
0.6
0.8
Ab_tissue
Bait_tissue
Centro_roe
Helio_roe
Peri_tissue
Prey


Barrens
Mean
0.0
0.2
0.4
Ab_tissue
Centro_roe
Helio_roe
Mussel_tissue
Peri_tissue
Prey


Incipient - Reserve
Mean
0.0
0.2
0.4
0.6
0.8
Ab_tissue
Centro_roe
Helio_roe
Peri_tissue
Prey


Prey
Ab_tissue
Bait_tissue
Centro_roe
Helio_roe
Mussel_tissue
Peri_tissue

Conclusions

It’s difficult to describe the diet of a **generalist predator**

Lobsters **can and do** eat Longspined Sea Urchins

Lobster preference, predation rate and native prey abundance may reduce the likelihood of lobsters being an effective control of barren expansion

We need to **encourage additional methods of control** to support lobster predation in areas at risk of transition to urchin barren

Thanks for listening!

ICES Journal of Marine Science, 2022, **00**, 1–10
DOI: 10.1093/icesjms/fsac058
Original Article

ICES International Council for the Exploration of the Sea
CIEM Conseil International pour l'Exploration de la Mer

Spiny lobsters prefer native prey over range-extending invasive urchins

Jennifer E. Smith [1,*], John Keane [1], Craig Mundy [1], Caleb Gardner [1] and Michael Oellermann [1,2]

Co-authors: John Keane, Craig Mundy,
Caleb Gardner & Michael Oellermann

Lab Assistants: Shenae Willis, Ella Clausius & Aidan Dudgeon

je.smith@utas.edu.au
@_jenniesmith

WEDNESDAY TALKS
Dr John Keane - 11:45
A/Prof Scott Ling - 13:45

IMAS INSTITUTE FOR MARINE & ANTARCTIC STUDIES

UNIVERSITY of TASMANIA

FRDC

ECOLOGICAL SOCIETY OF AUSTRALIA

Abalone Industry Reinvestment Fund

Southern Rocklobster LIMITED