

Reducing entanglement rates of humpback whales off Western Australia using spatio-temporal specific gear modifications

Jason How



Government of **Western Australia**
Department of **Fisheries**



The WRL Fishery



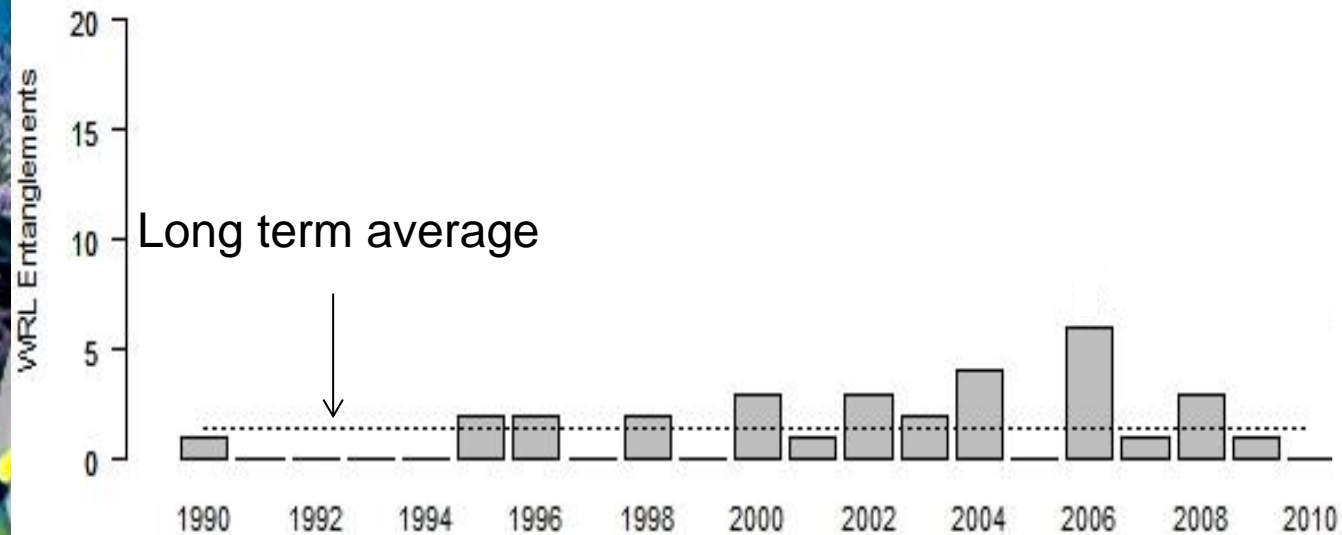
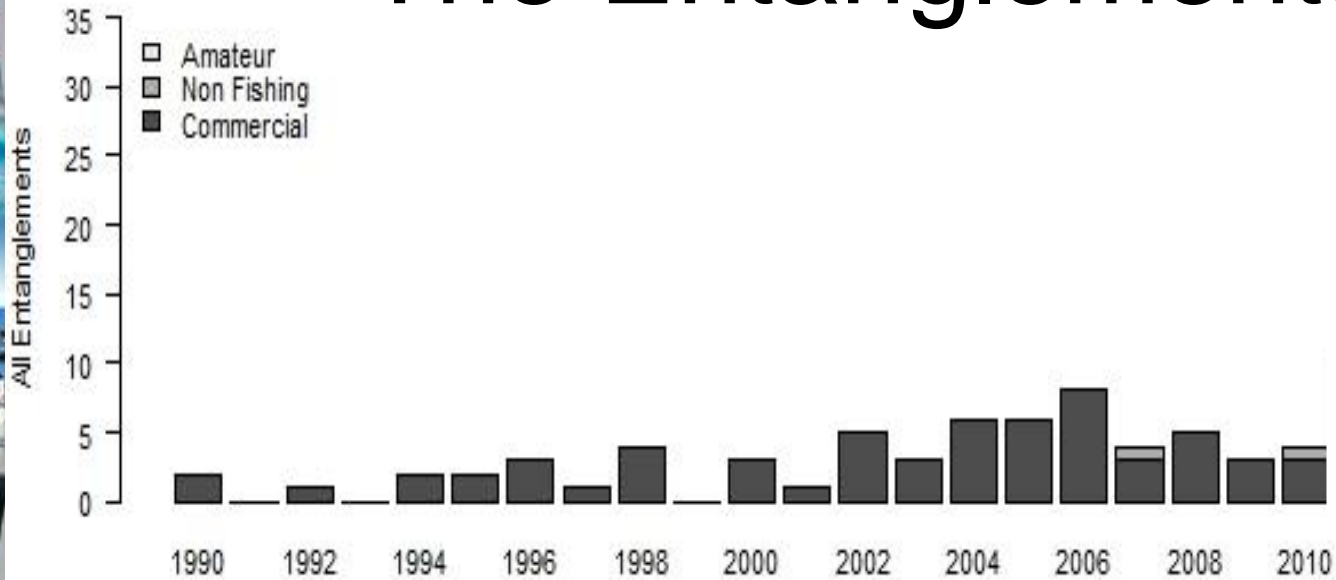
- 1st MSC Fishery
- Worth ~ \$400 million
- Transition to quota 2010
- Increase in season length
- Beach price \$20 - \$100+
- Winter fishing ~\$100 million

West Australian Humpbacks

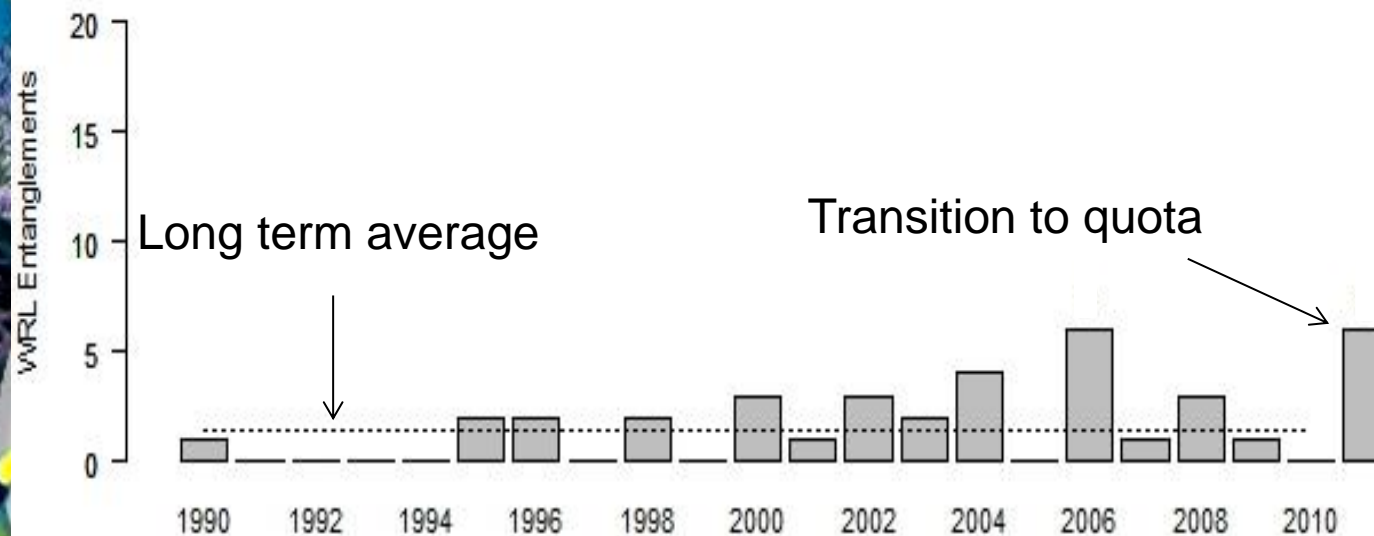
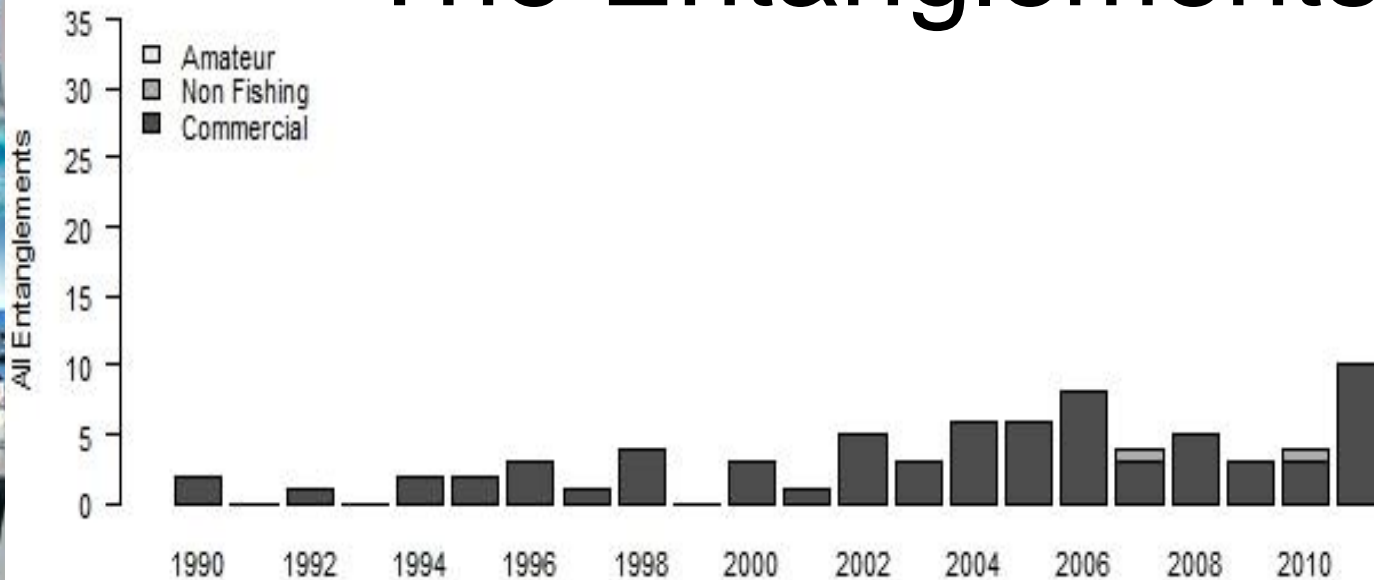


- Largest pop'n of humpbacks in S^{thn} Hemisphere
- 20,000 – 50,000
- Migrate May to November

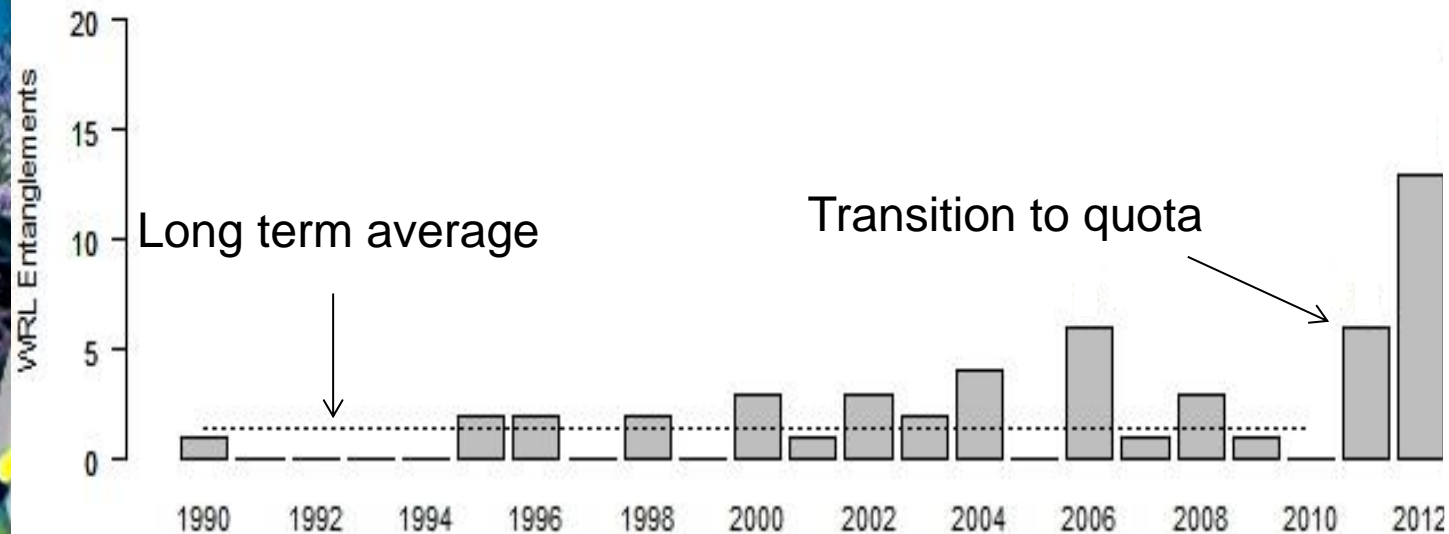
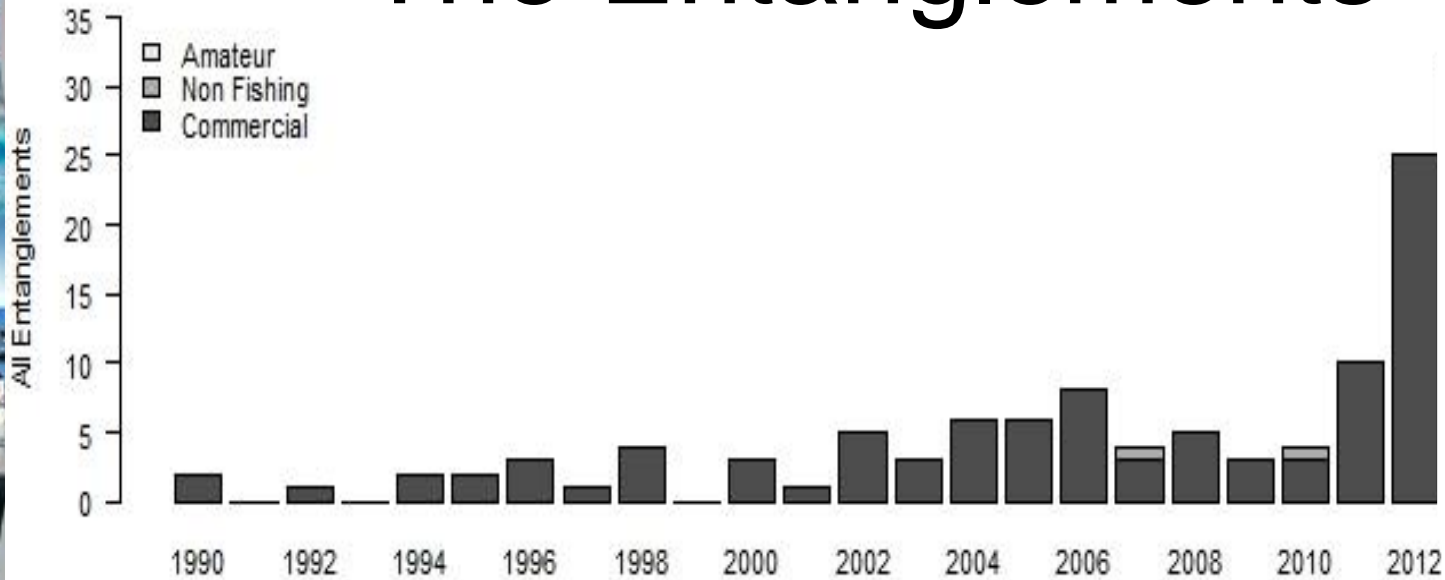
The Entanglements



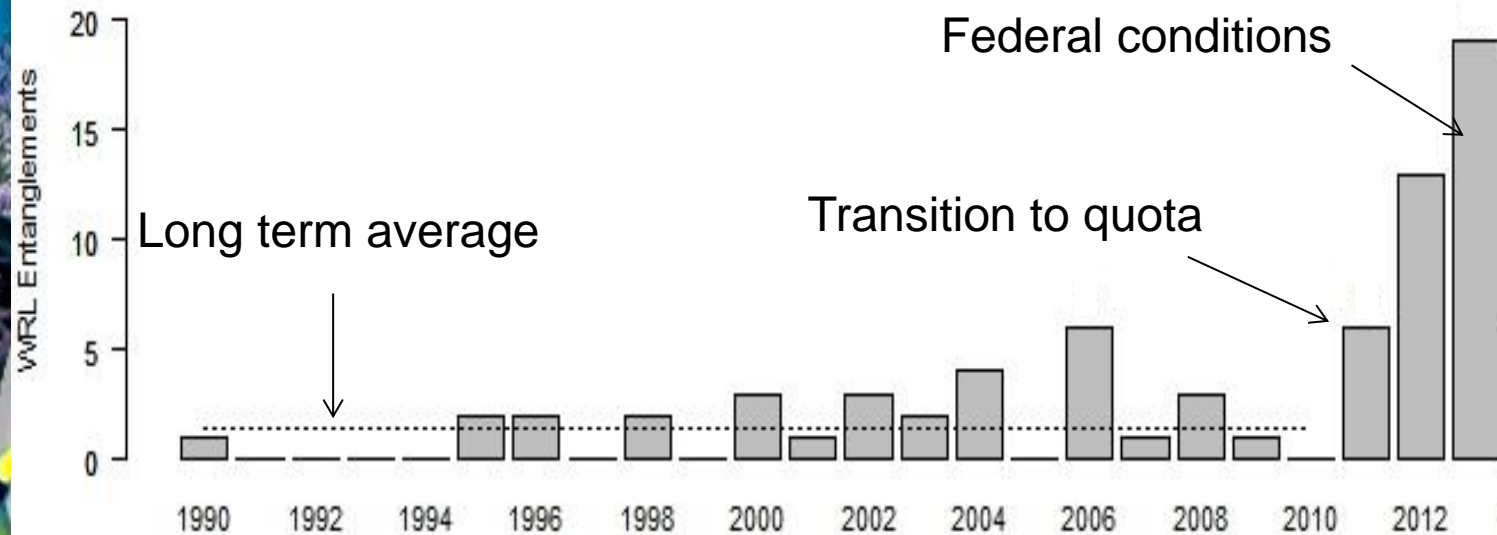
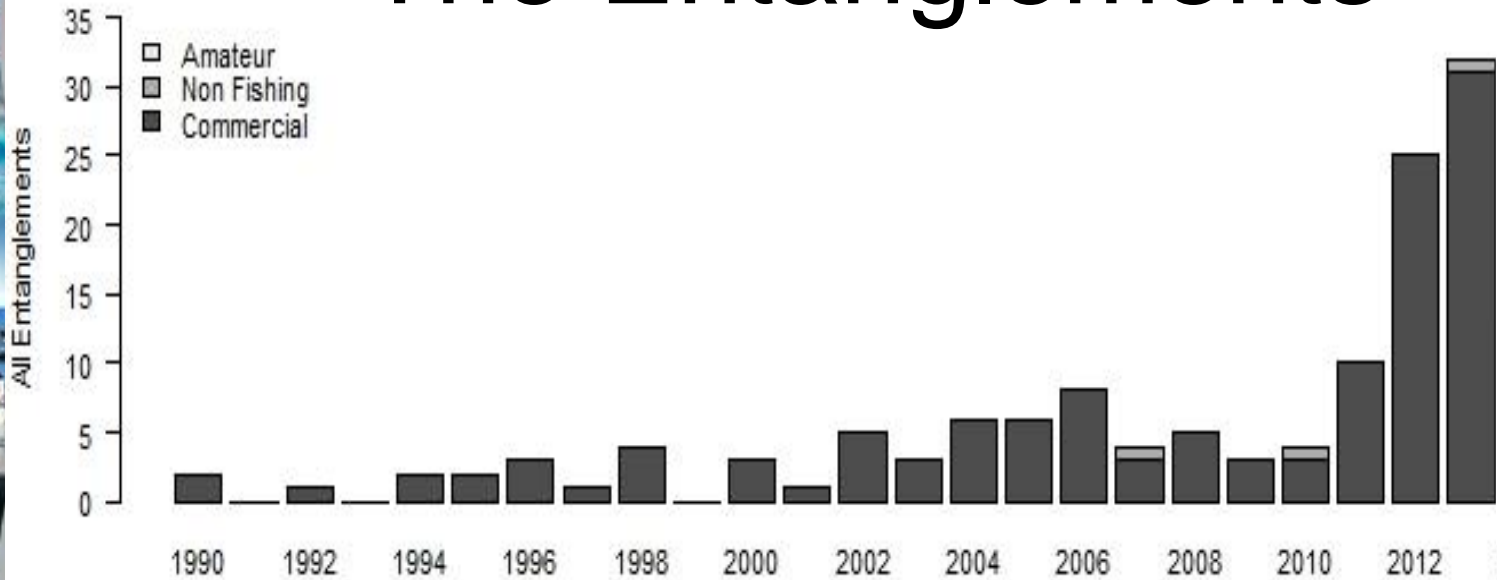
The Entanglements



The Entanglements



The Entanglements

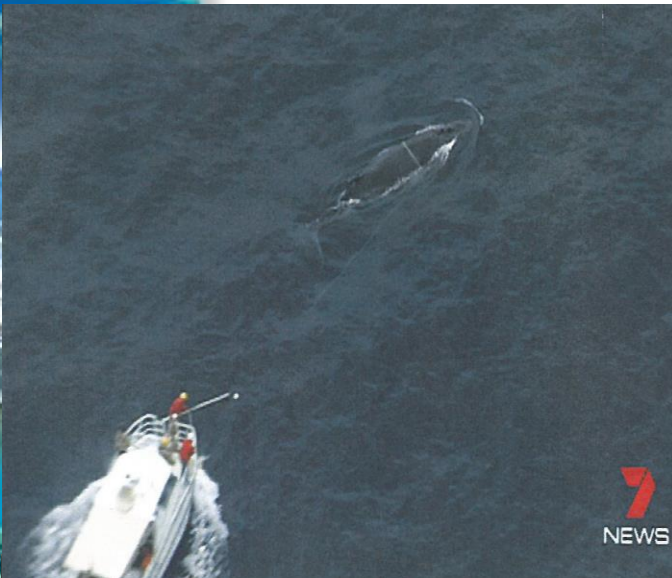


The Response

- Federal Government
 - Remove from LENS; Grant WTO
 - Condition relating to whale entanglements
 - 2 years
- State Government
 - Require action or possible closure without approved gear modifications



The Social Aspect



7 NEWS

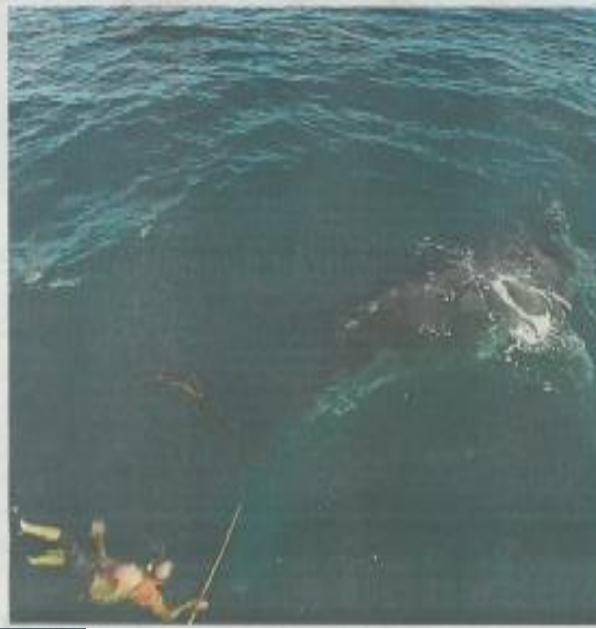


7 NEWS



LOBSTER TRAP DRAMA

Baby whale rescue becomes a video hit



Whale rescuer lucky to survive sting in the tail

Daniel Mercer

Doug Coughran is nothing if not self-deprecating.

Just two months after a near-death experience in which he was almost speared through the eye while trying to free a tangled whale, the wildlife veteran offers a wry observation when describing the incident.

"Put it this way, I knew what was ugly was going to be uglier," Mr Coughran said, referring to his face and the injuries he sustained in the freakish incident.

One of Australia's foremost whale experts, Mr Coughran, a senior wildlife officer with the Department of Parks and Wildlife, was almost killed during the incident in July that has until now been largely a secret.

The 62-year-old, who in 2010 was appointed a Member of the Order of Australia for his contribution to conservation, was off Busselton to free a 40-tonne



Near-fatal encounter: Department of Parks and Wildlife senior officer Doug Coughran shows his wounds.



The Research

- Aims:
 - What modifications reduce entanglements
 - Examine gear
 - Trial options
 - Where and when modifications used
 - Whale movement data
 - Inter-annual migration timing

Identify and assess gear modifications

- Industry workshop – 23 options
- Seven gear modifications
 - Remote release (anode / acoustic)
 - Reduce slack rope (sectional ropes)
 - Fewer larger floats
 - Weak links
 - Negatively buoyant rope
 - Biodegradable rope
 - Acoustic Pingers (whale trial)
- Trailed in ABSENCE of whales

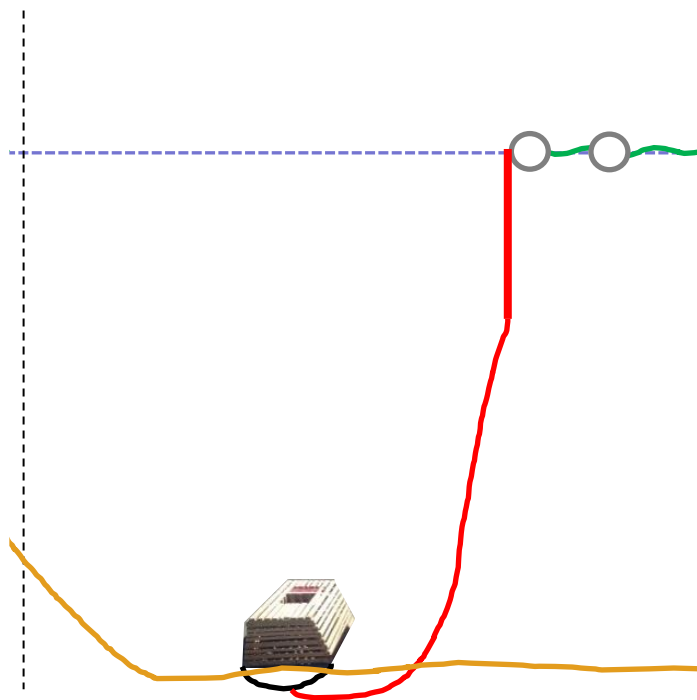


Identify and assess gear modifications

Gear Modification	Cost	Practicality	Final Score
Acoustic Release	1	1	2
Anode Release	2	1	3
Biodegradable Rope	7	3	10
Negatively Buoyant Rope	6	4	10
Neg. Buoy. Single large Float	5	5	10
Future Ocean Whale Pinger	3	7	10
Banana Whale Pinger	4	7	11



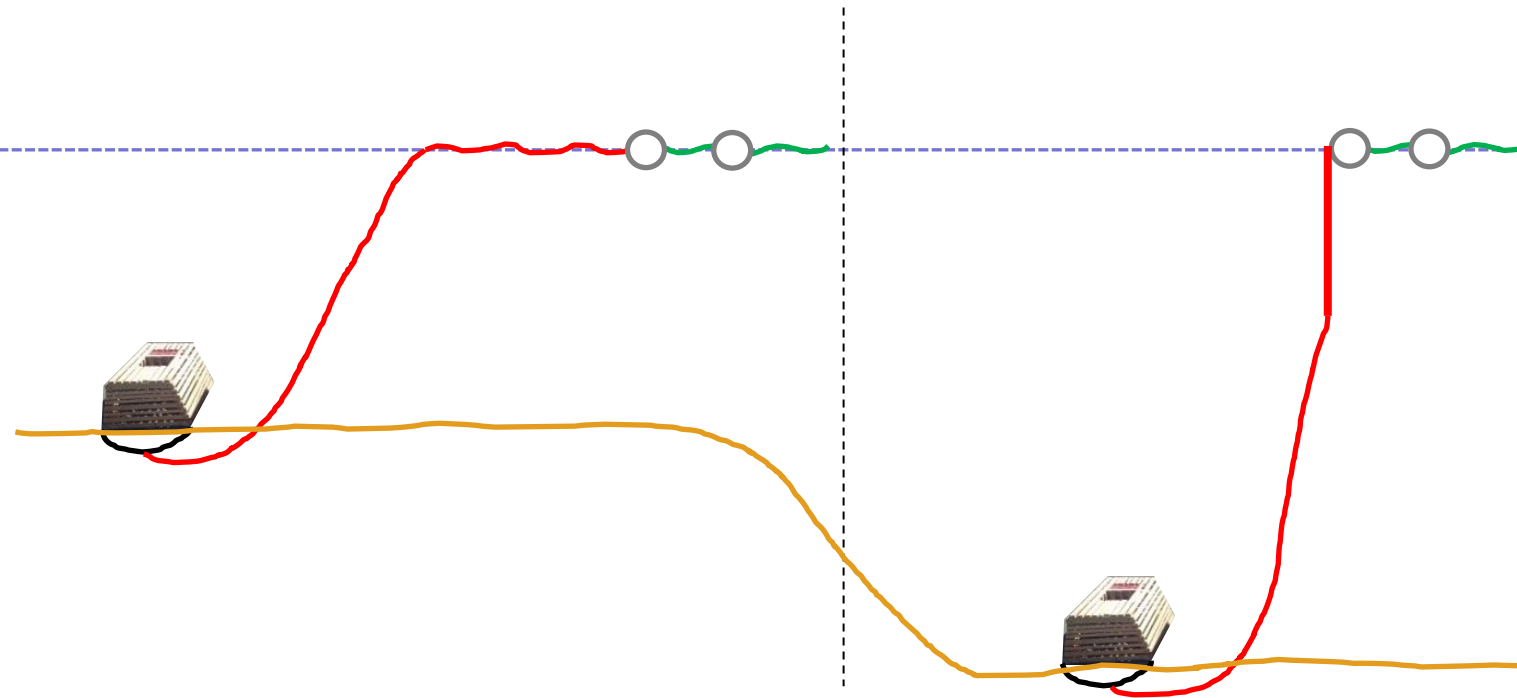
The Regulations



Deeper Water (>20 m)

- Rope (bridal-float) < 2x water depth
- No surface rope [negatively buoyant rope (top third)]
- Max float rig 5 fth (inc. tail)
- Max. 2 floats (<30 fathoms) Max. 3 floats (>30 fathoms)
- Pots pulled once every 7 days

The Regulations



Shallow Water (~<20 m)

- No rope / water depth ratio
- Surface rope permitted
- Float rig inc. in total rope
- Max. 2 floats
- No max pull period

Deeper Water (>20 m)

- Rope (bridal-float) < 2x water depth
- No surface rope [negatively buoyant rope (top third)]
- Max float rig 5 fth (inc. tail)
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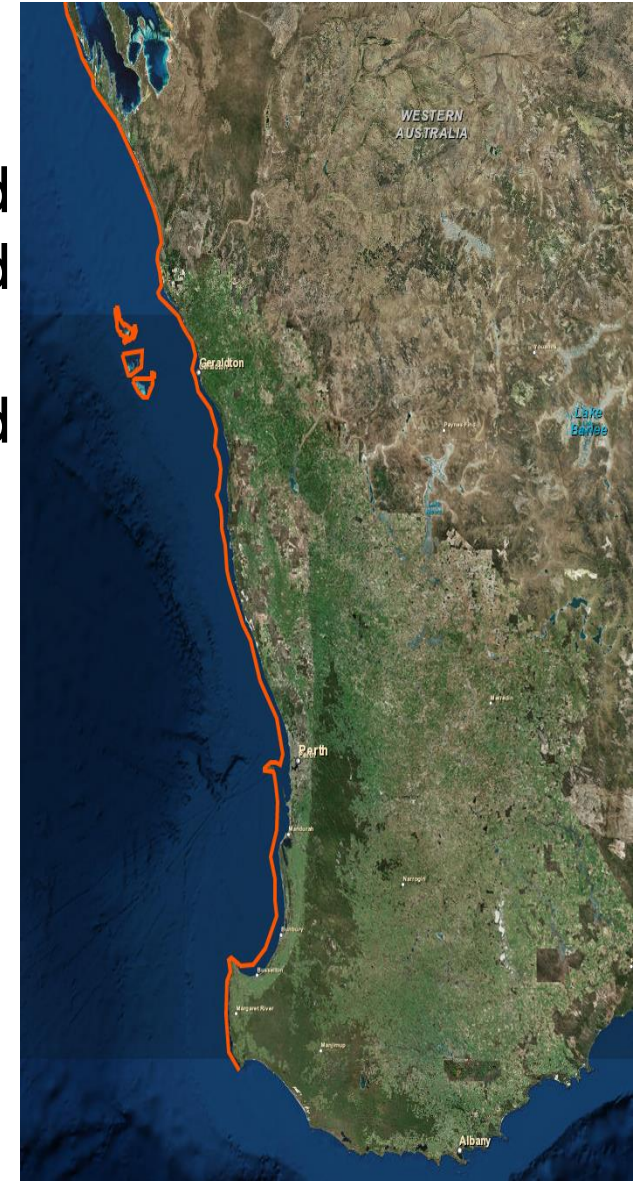
Regulation Changes

Spatial Changes (“shallow water”)

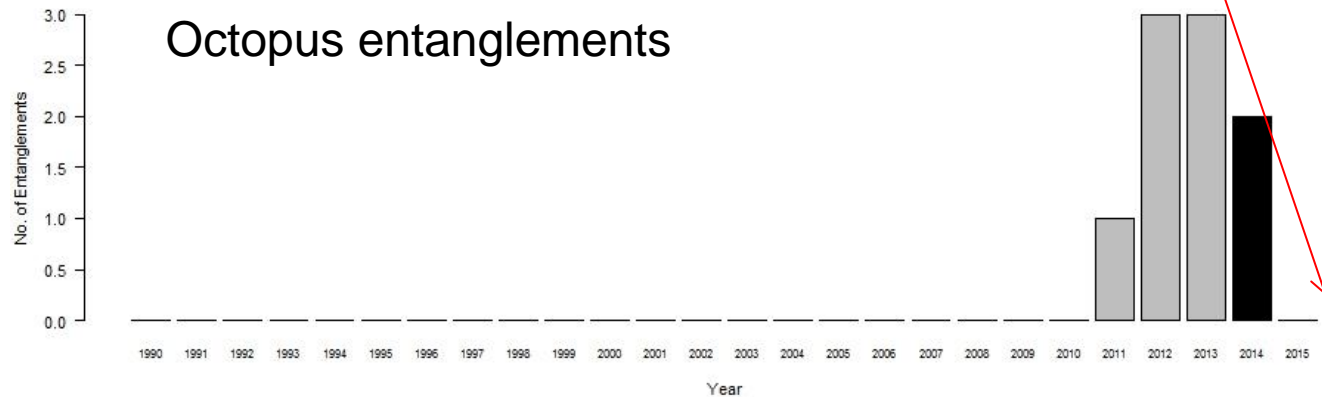
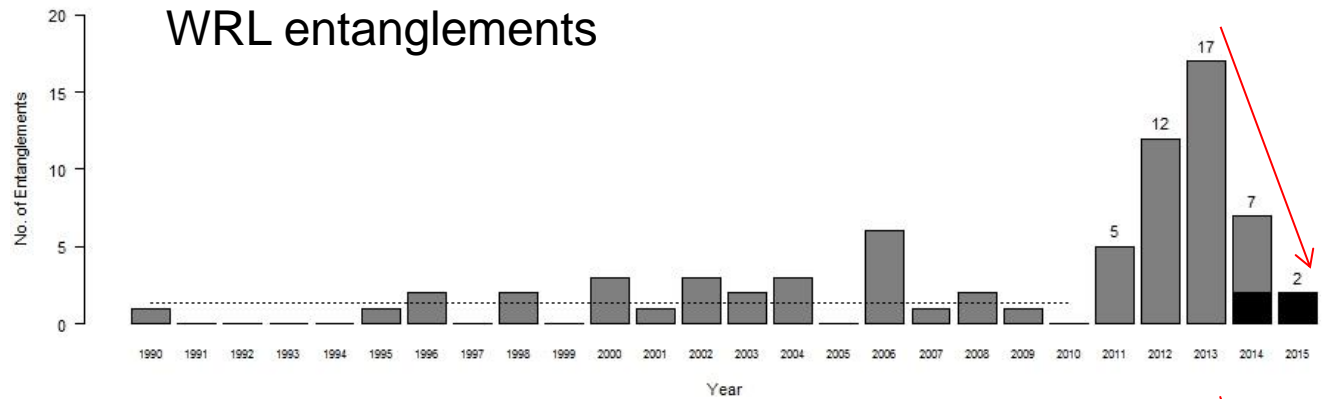
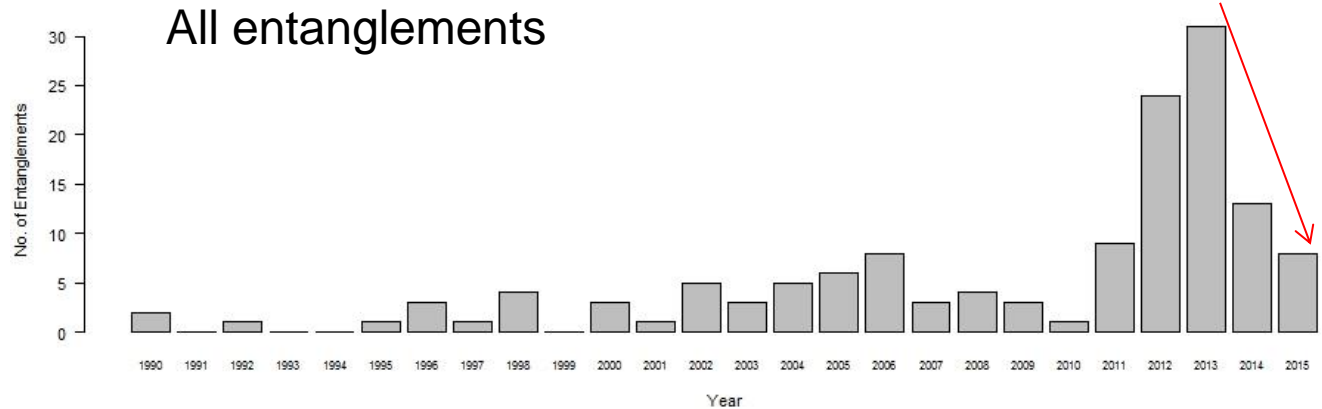
- 2014 - 15 fathoms total unweighted
- 2015 - 18 fathoms total unweighted inside (whale zone)
- 2016 - 18 fathoms total unweighted

Temporal Changes

- 2014 Jun/Jul – 14 Nov
- 2015 1 May – 14 Nov
- 2016 1 May – 31 Oct



Entanglements per season

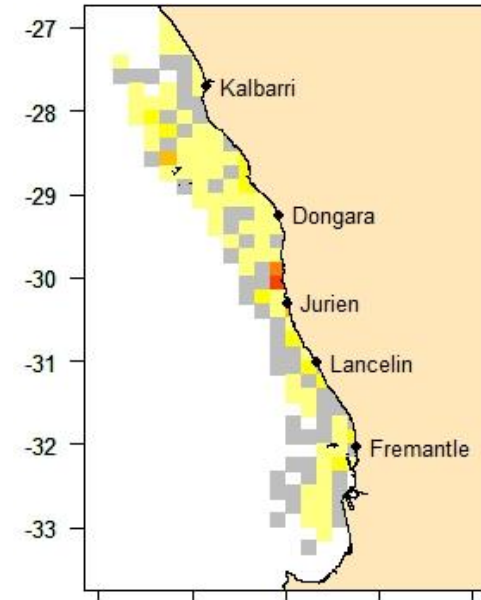
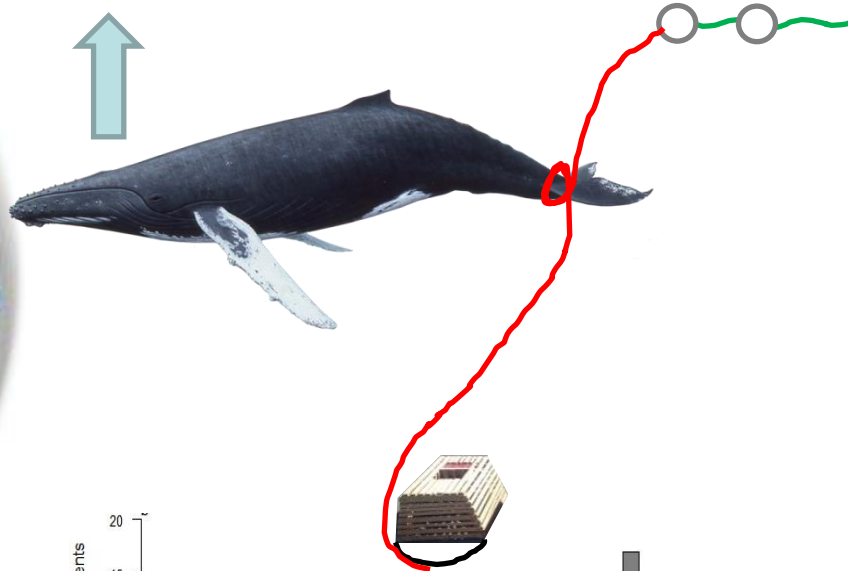


Assessment of Regulation Changes

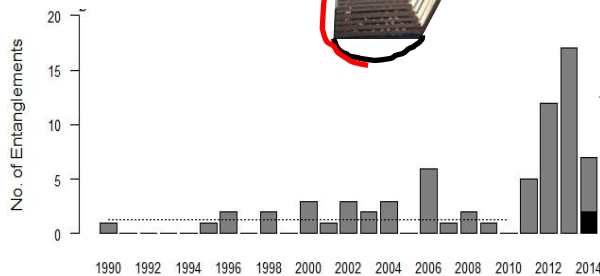
- Assess
 1. Gear modification effectiveness
 2. Likely months associated with entanglements
 3. Likely depths associated with entanglement
- Compare between years
 - Before and after mods
 - Account for / sensitivity analysis number of factors



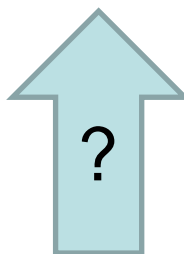
An Entanglement



By 10 fathom depth

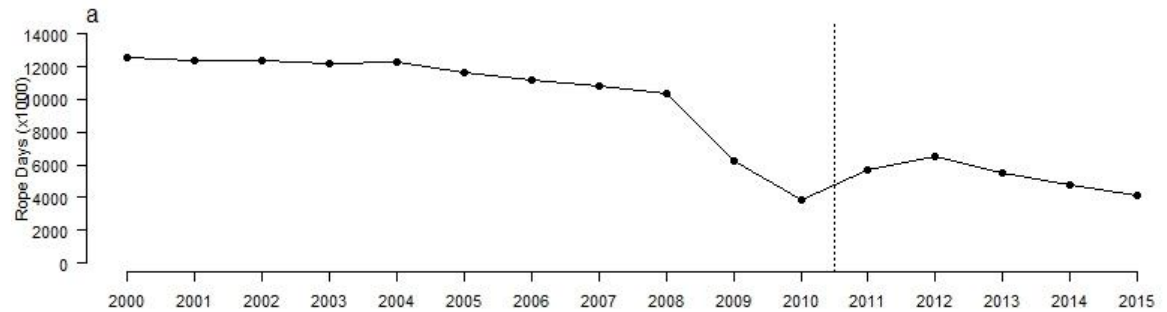


- Ross-Gillespie *et al.* 2014
 - (upper, mid & lower)
- Reporting Rate (0 – 10% p.a.)
 - ½ offshore
- Lag (0, 1, 7, 14, 21, 28 & 35 days)

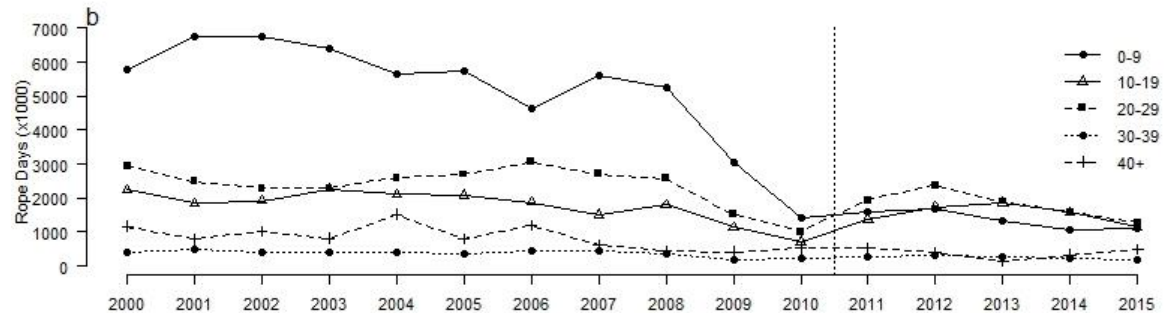


Change in Fishing Effort

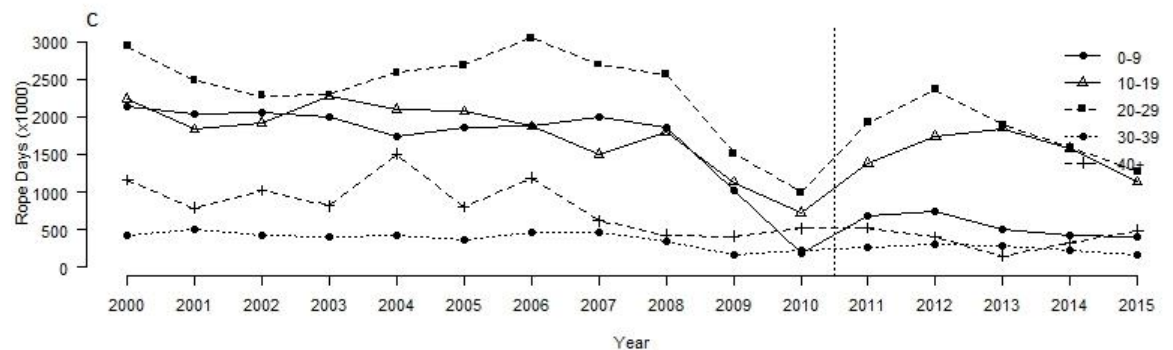
Overall



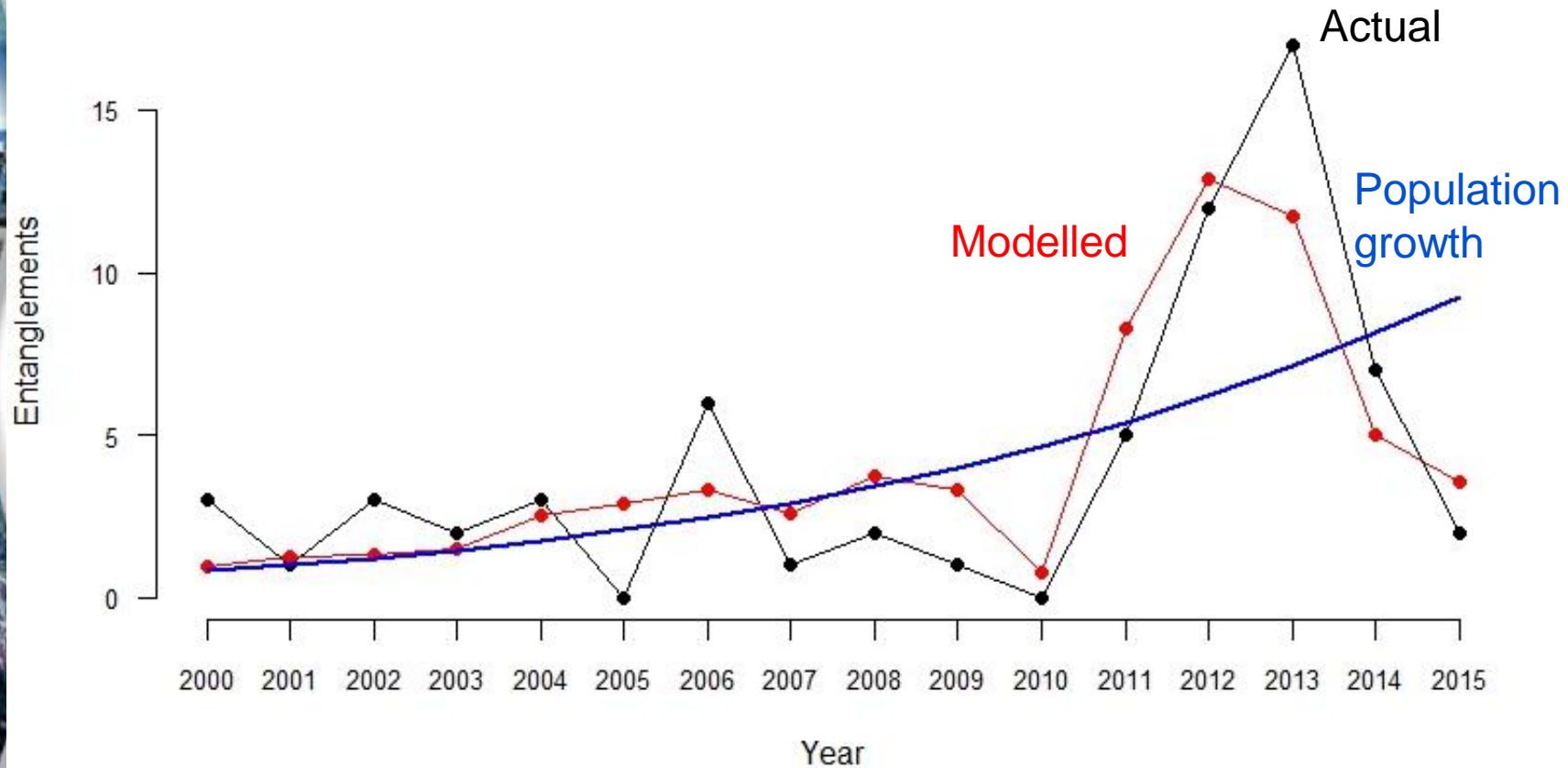
Overall by depth



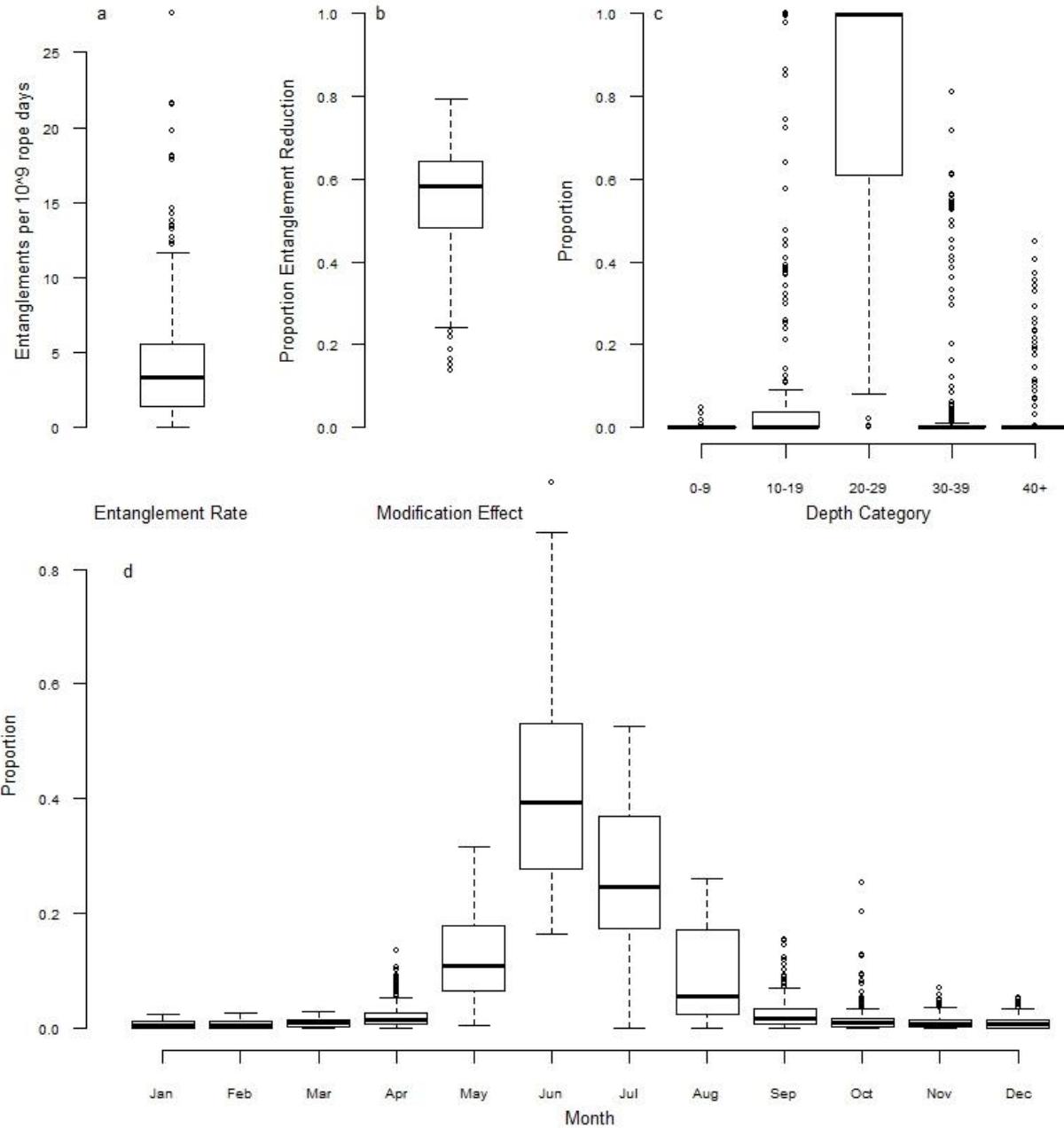
Overall by depth
(May-Nov)



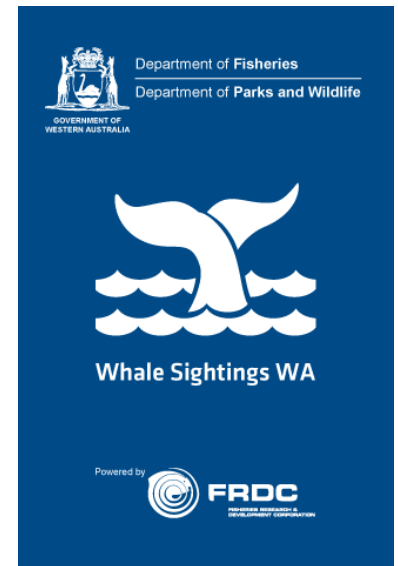
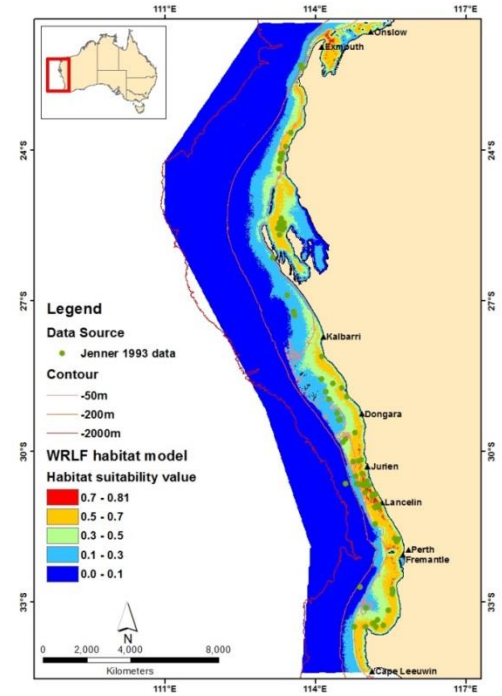
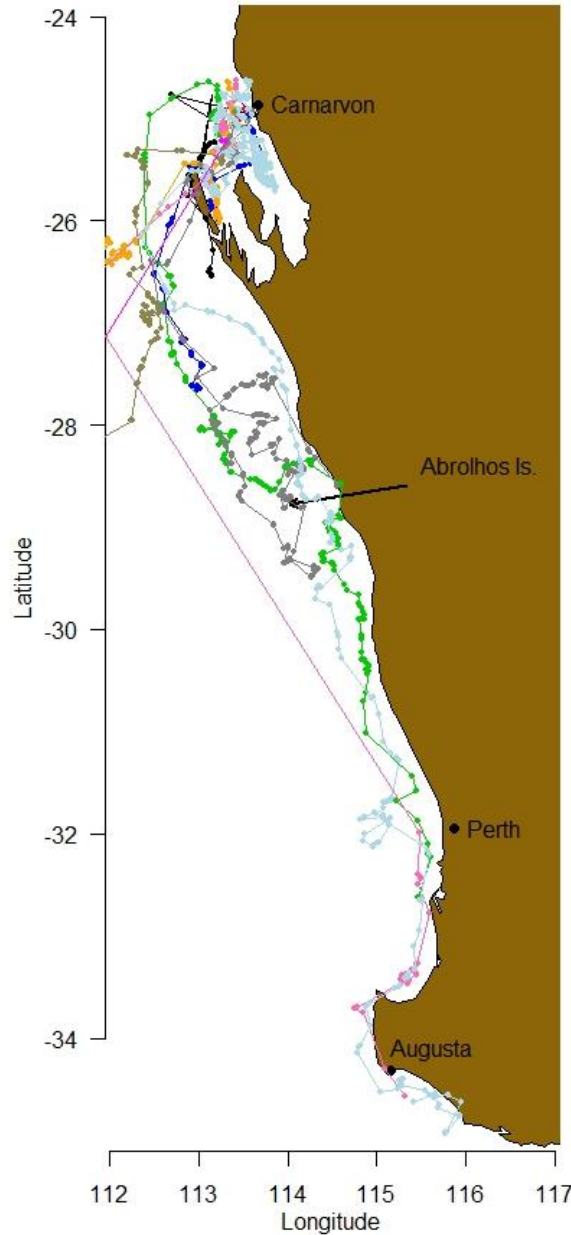
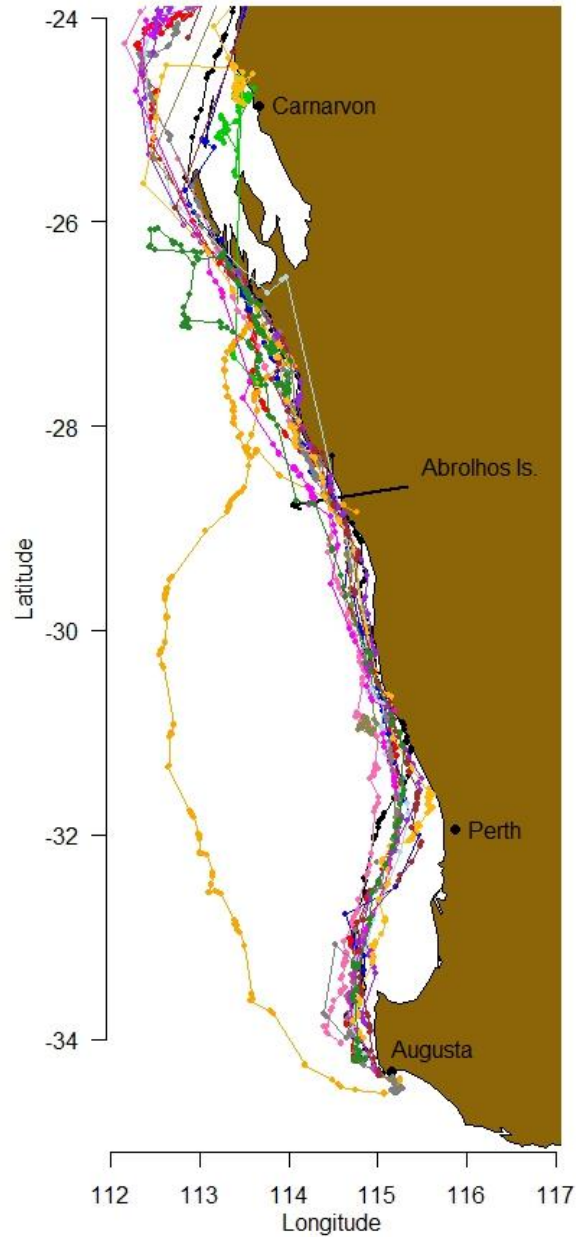
Gear Modification Model



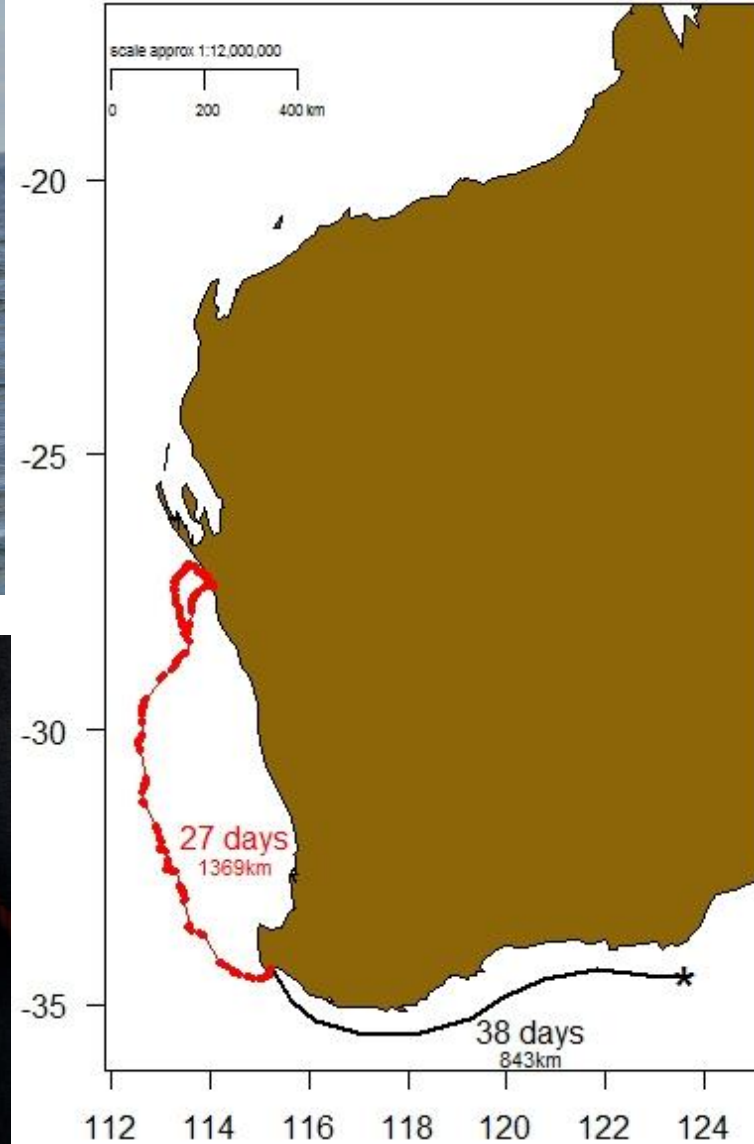
Gear Modification Sensitivity



On-going Spatial Work



Entanglement Tracking



On-going Other Work

