

CSP May 2012

Ursula Ellenberg

Impact of Commercial Fisheries on Yellow-eyed penguins



what we know and what we need to know

What we know...



Sylvestre Popinet & Christel Freidel

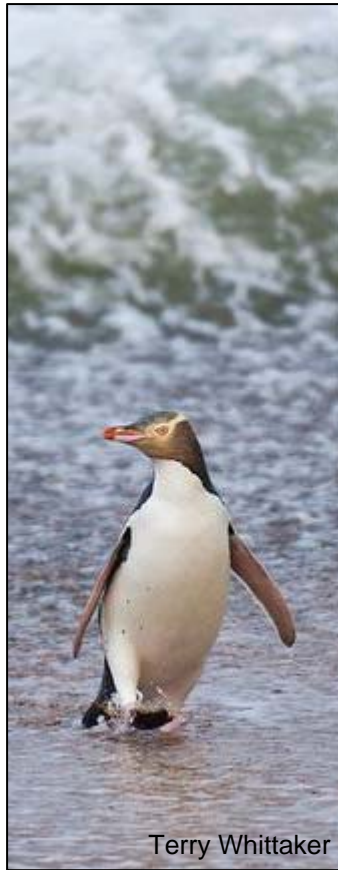
- YEP facts
- Fisheries bycatch
(set net & trawl)

... what we need to know:

- Mortality rates
- Operational details

➤ Representative independent observer programme (incl. EM)

The yellow-eyed penguin



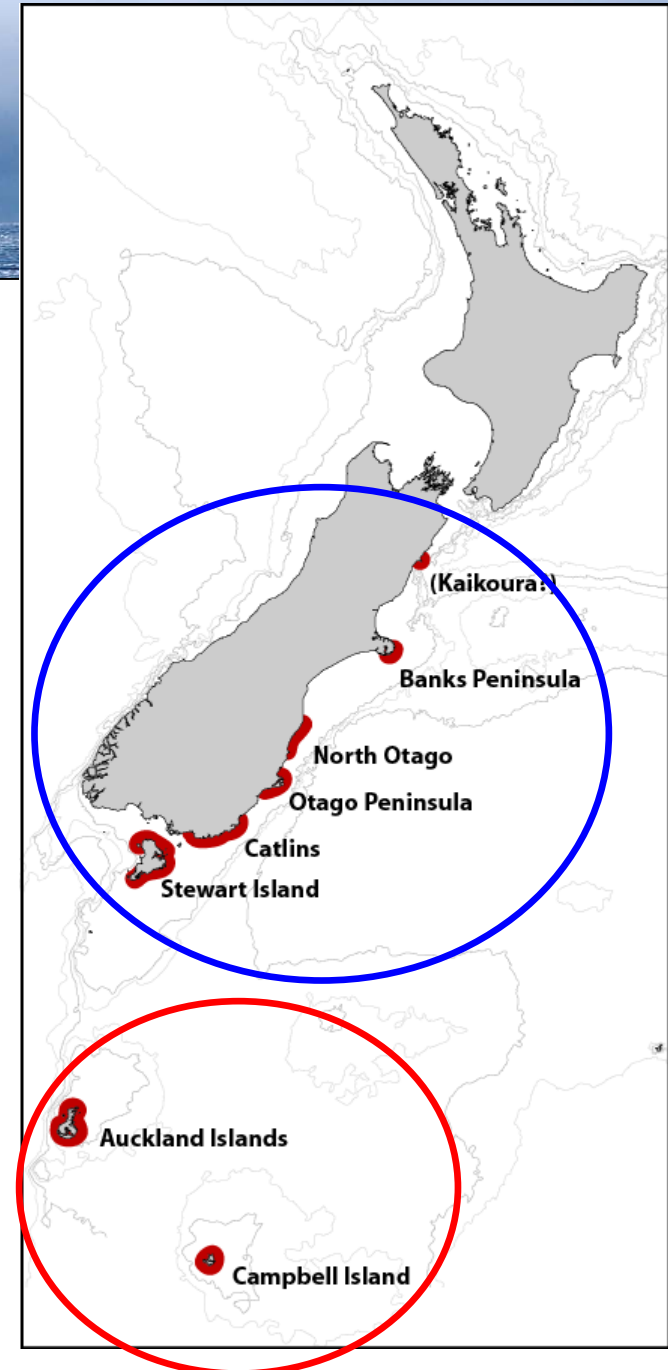
Terry Whittaker

- Endemic, endangered, threatened
- Long-lived (>25 years)
- Low adult mortality (0.09 - 0.17)
- Spend >60% of their life at sea
- Population viability analysis shows small increase in adult mortality ++ increase in extinction probability (McKinlay 1997)

YEP distribution



- Mainland 400-600 bp (>30yrs)
- Stewart Island 178 bp (2001-03)
- Auckland Islands 520-570?? (1989)
- Campbell Island 350-540 bp (1992)
- **Two distinct populations that need to be managed separately**



Yellow-eyed penguin flagship species

for tourism industry

➤ Otago Peninsula alone

\$100 million p.a.

to the local economy



www.DunedinNZ.com

Visitor Information

Trade and Media

Convention Bureau



Tisdell, C., 2007. Valuing the Otago Peninsula: the Economic Benefits of Conservation. Working Paper 145, Economics, Ecology and the Environment, University of Queensland.

Visitor Information

What to See & Do

Events & Festivals

Accommodation

Food Fashion Coffee

Getting Here & Around

Contact Us

Links

What to See & Do

SEARCH SITE

GO

Penguins as marine sentinels



Direct effects – set net bycatch

- Between 1979 and 1997 a total of 72 confirmed deaths (Darby & Dawson 2000)
- **Majority of incidents unreported!**



Direct effects – set net bycatch

- Lack of reporting by unobserved vessels
- Historically low observer coverage ~2%
- Effort to increase observer coverage
- **Coverage still low and heterogeneous**
- **Spatially and temporarily limited**
- **Little coverage in high risk areas**



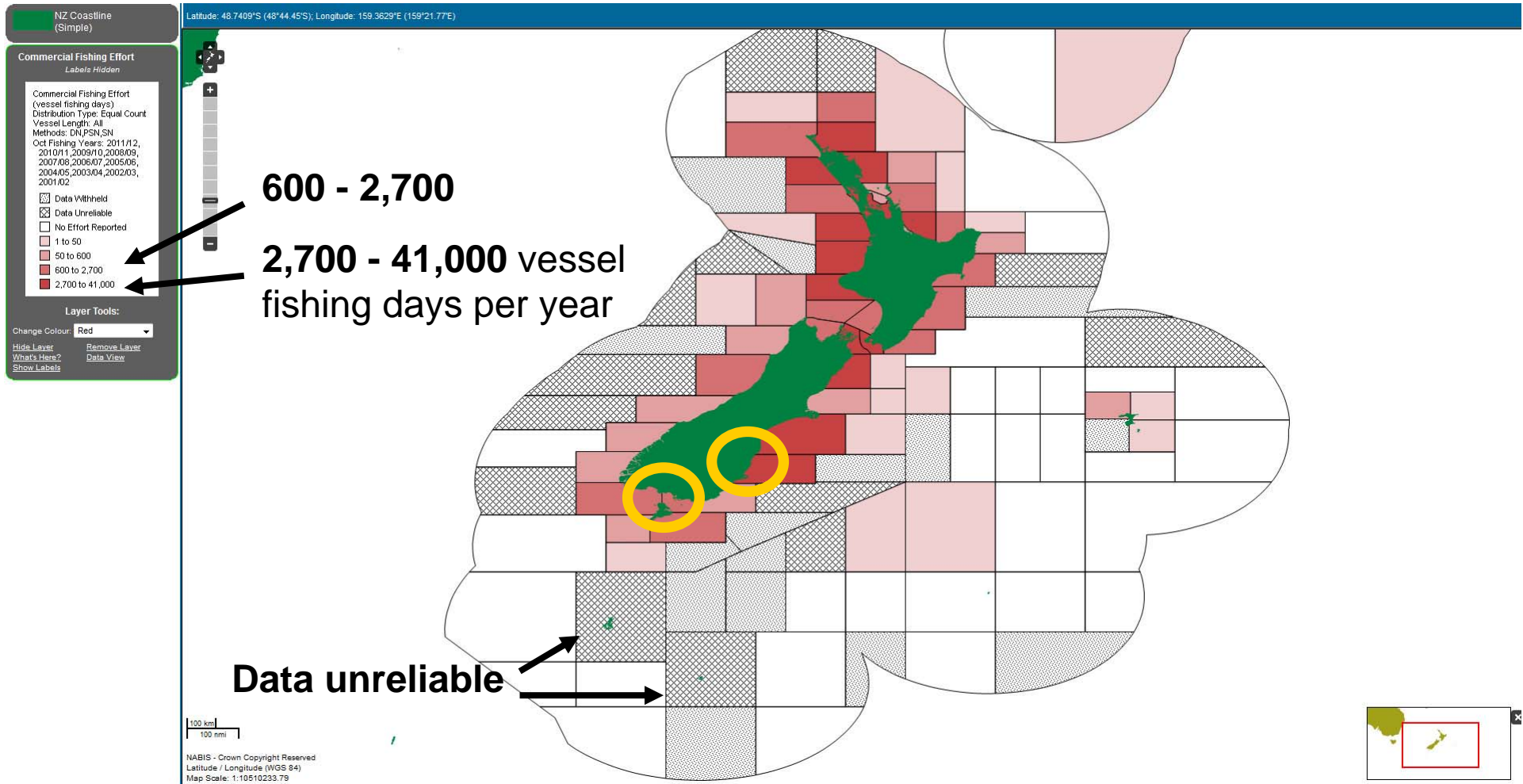
Direct effects – set net bycatch

FMA / Season	Observer Coverage	Observed penguin bycatch	Reference
SEC, FMA 3			
2005/2006	0.43%	0	Rowe (2009)
2006/2007	0.88%	0	Rowe (2009)
2007/2008	6.84%	0	Rowe (2010)
2008/2009	21.48%	4	Ramm (2010)
2009/2010	18.14%	1	Ramm (2012)
Total	9.55%	5	
SOU, FMA 5			
2005/2006	5.20%	0	Rowe (2009)
2006/2007	10.87%	2	Rowe (2009)
2007/2008	25.04%	1	Rowe (2010)
2008/2009	23.96%	1	Ramm (2010)
2009/2010	18.14%	0	Ramm (2012)
Total	18.55%	4	

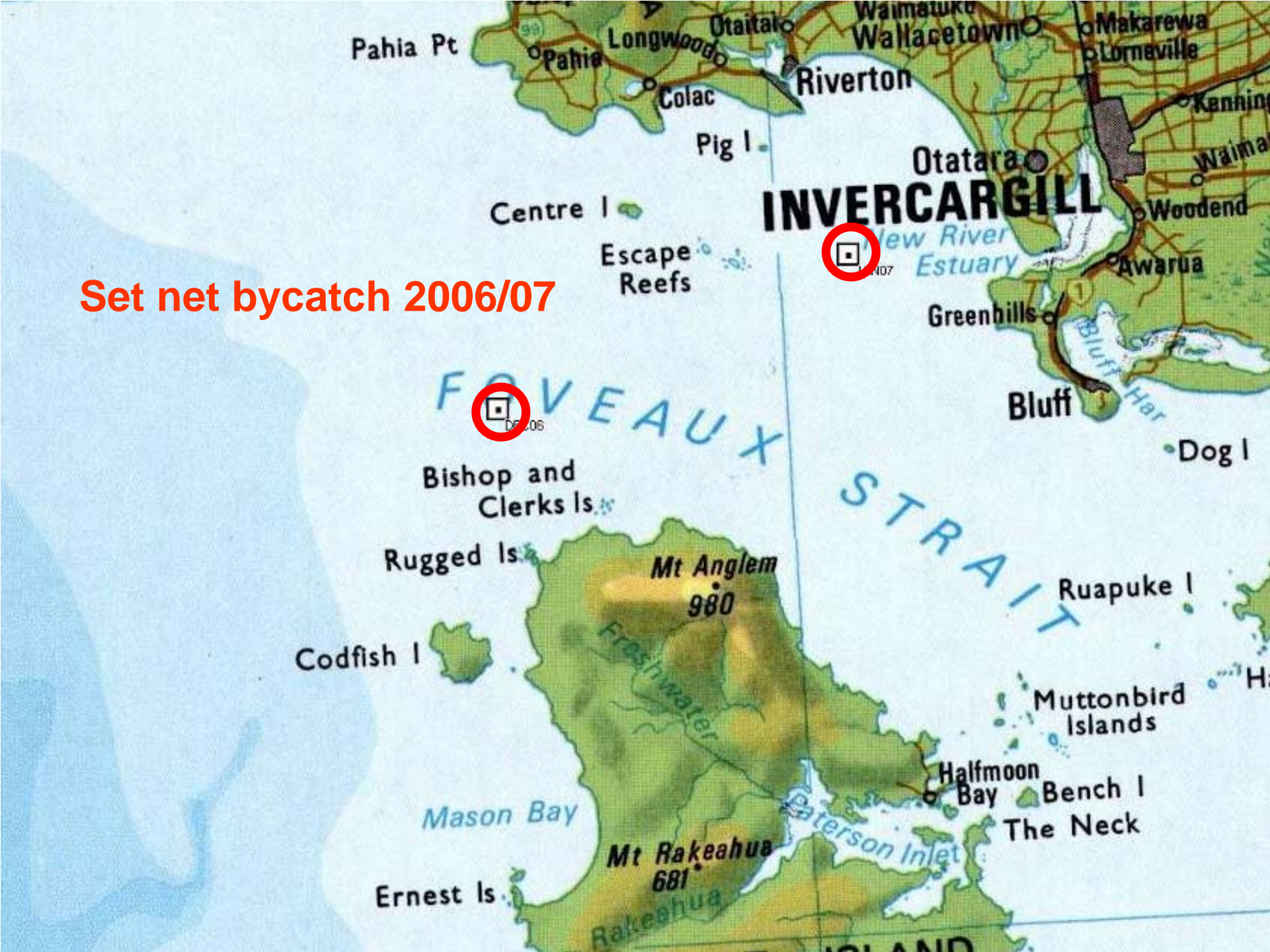
Commercial set net fisheries effort



Set net effort average for 2001-2011



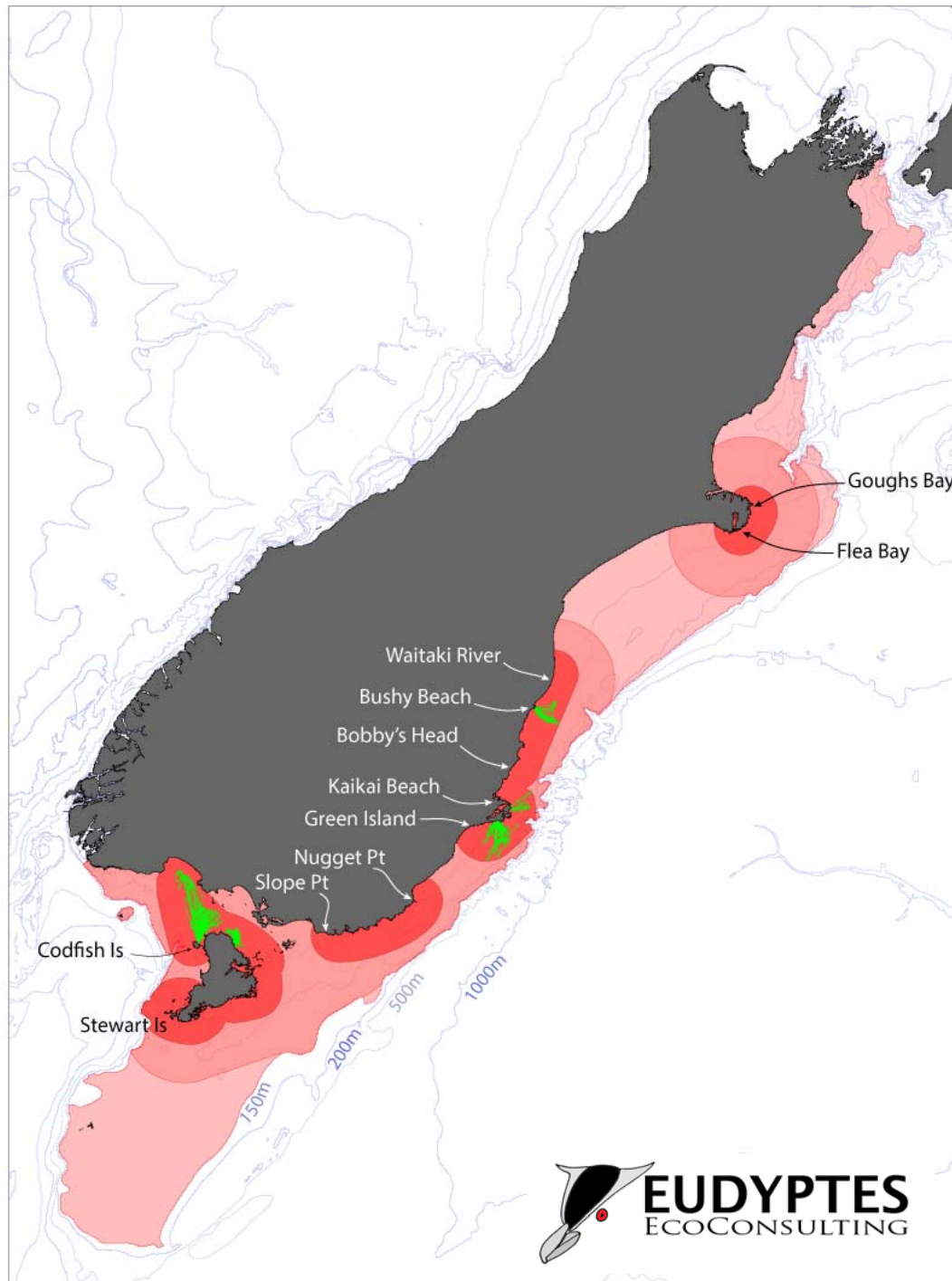
Set net bycatch 2006/07




Set net bycatch 2009/10


Bycatch: from shallow coastal waters to depths >140m and 20km offshore

Estimated yellow-eyed penguin foraging areas around the New Zealand mainland



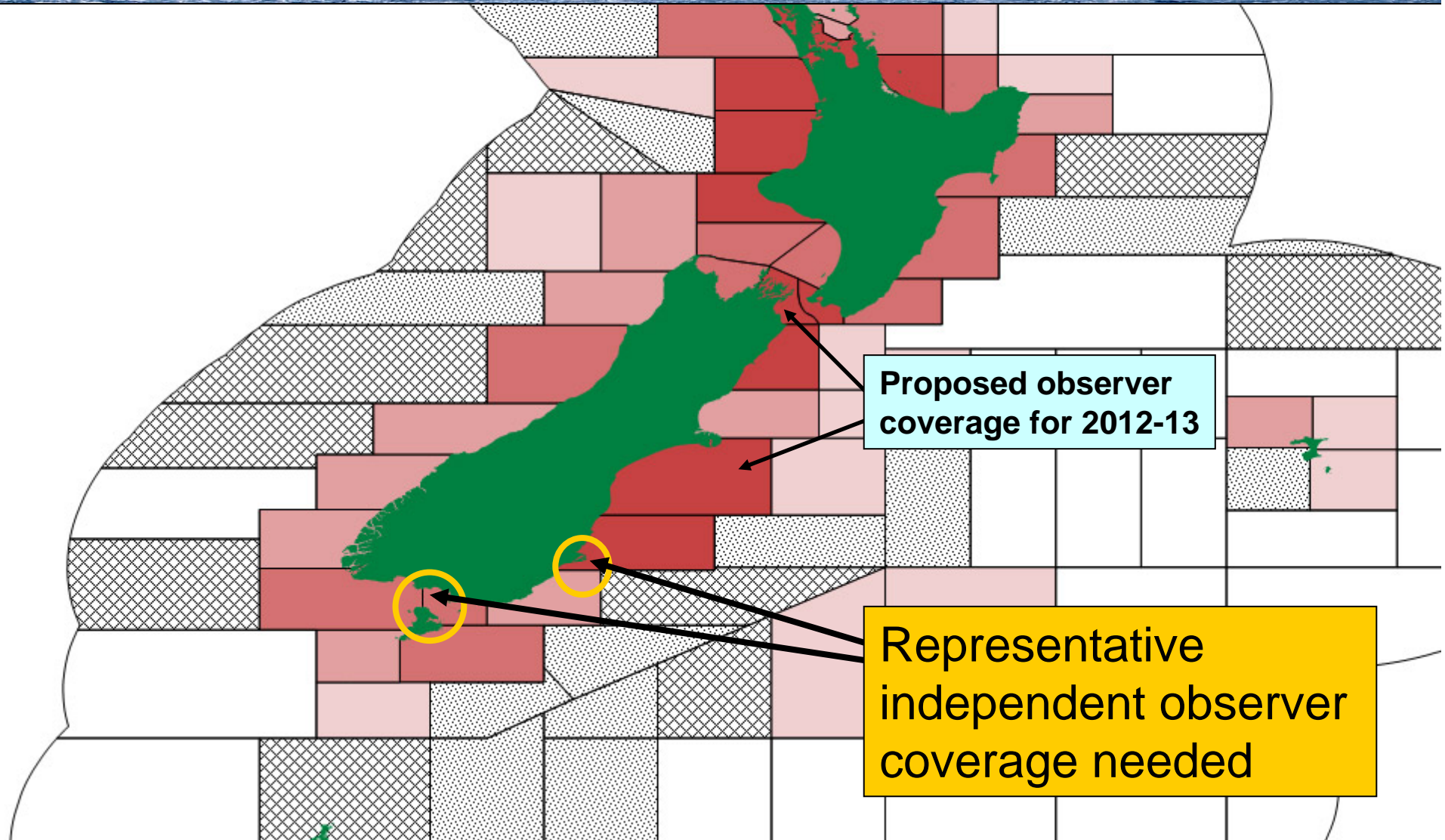
 **Non-breeding period**
Foraging ranges limited by 150m depth contour

 **Breeding period - "bad season"**
Foraging ranges limited by 150m depth contour, maximum foraging radius 50km from nest site

 **Breeding period - "normal season"**
Foraging ranges limited by 150m depth contour, maximum foraging radius 20km from nest site

 **Foraging Tracks (GPS)**
Yellow-eyed penguin foraging tracks recorded at individual sites between 2003 and 2007

Direct effects – set net bycatch



Direct effects – set net bycatch

- Operational details of capture?

gear, effort, timing, location, total time and depth of deployment.

GPS tracks of vessels operating in the SEC and SOU.

- Mortality rates?

% juveniles vs adults.

% male vs female.

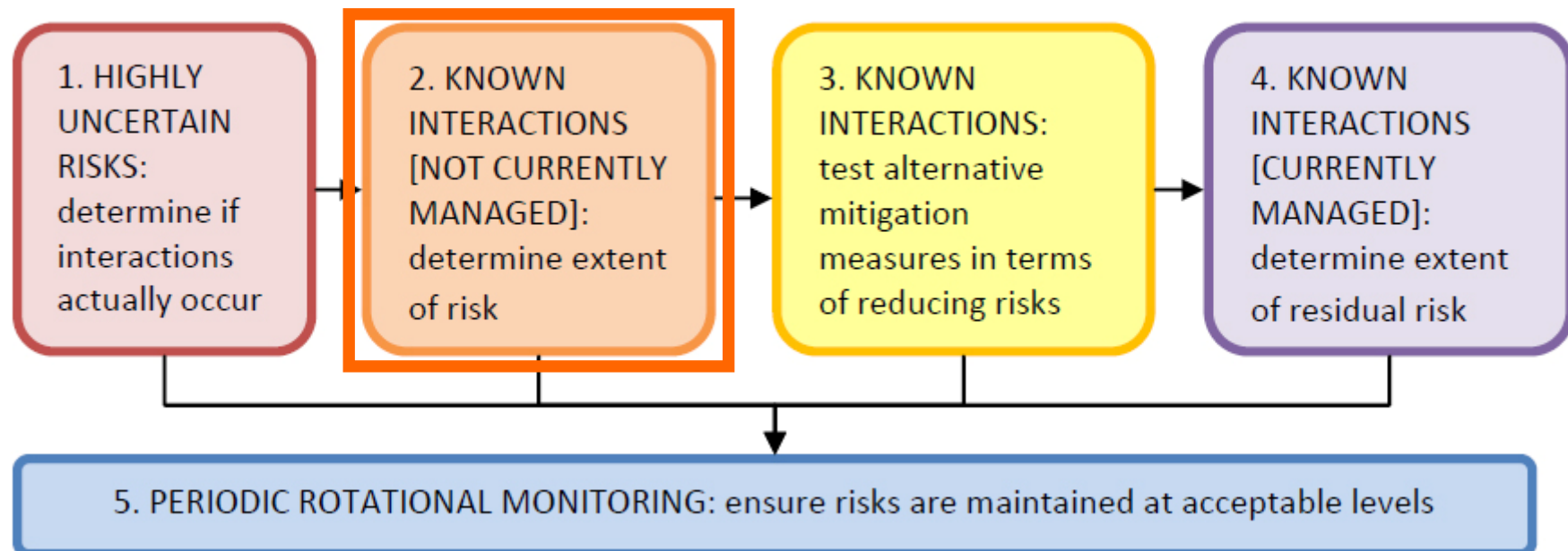
➤ **bycatch rates likely low
high observer coverage required!**

Otago &
Foveaux



Conservation Services Programme

Figure 1 – Tiered approach to monitoring protected species interactions with inshore fisheries

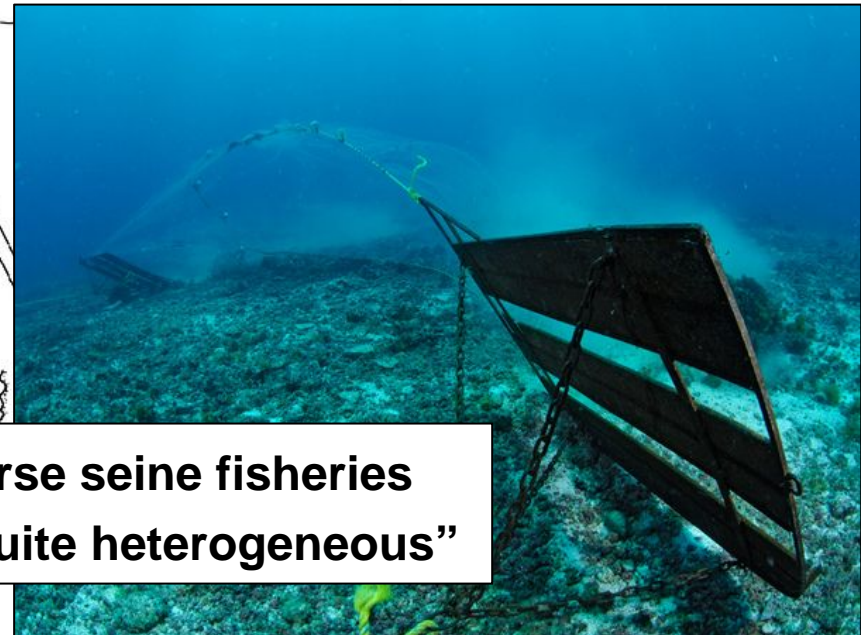
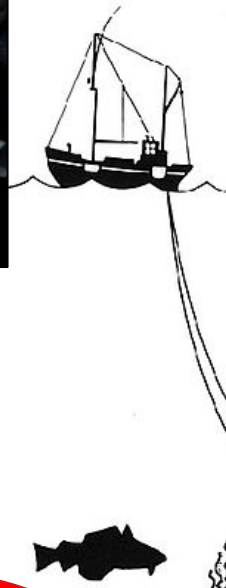


Direct effects – trawl bycatch

Richard et al. 2011

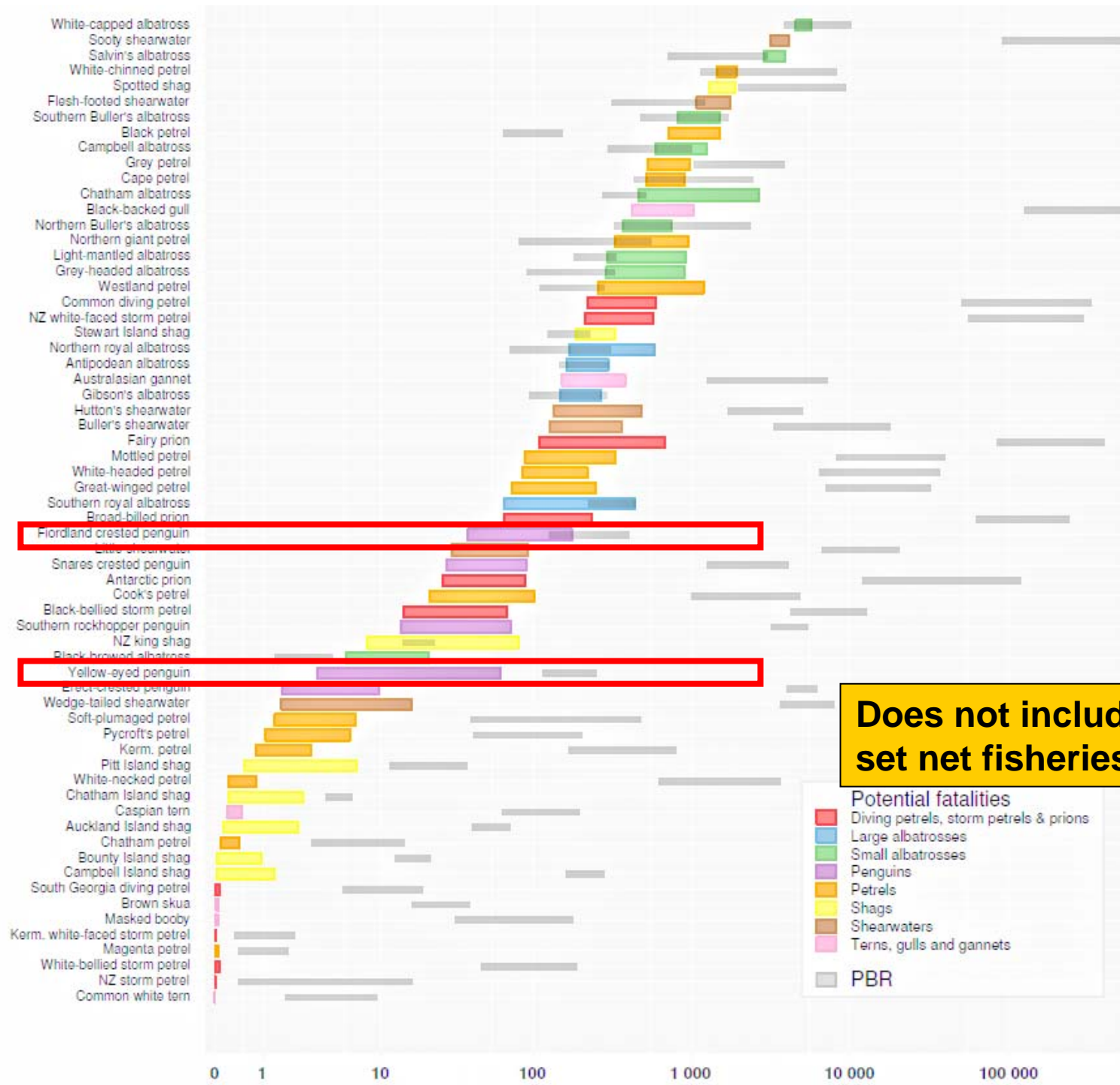


- Small inshore trawl 0-14
- Large fresher trawl 0-8
- Flatfish trawl 1-43
- Bottom longline 1-11



“Reliable risk assessment difficult due to lack of data”

Richard et al. 2011 excluded set net and purse seine fisheries because “they were poorly observed and quite heterogeneous”



Potential of EM – set net!

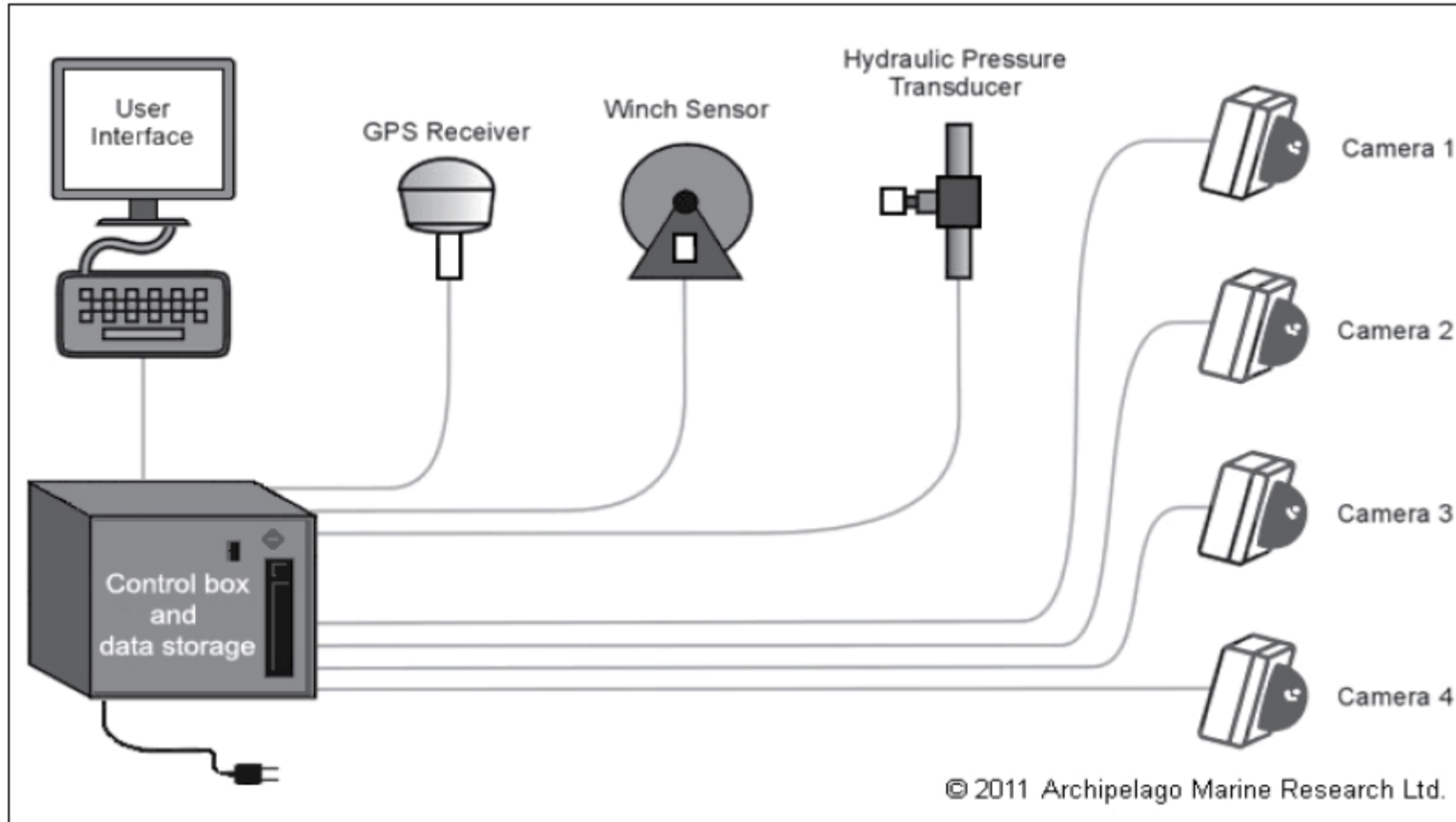


Set net vessels often small
struggle to accommodate
independent observer



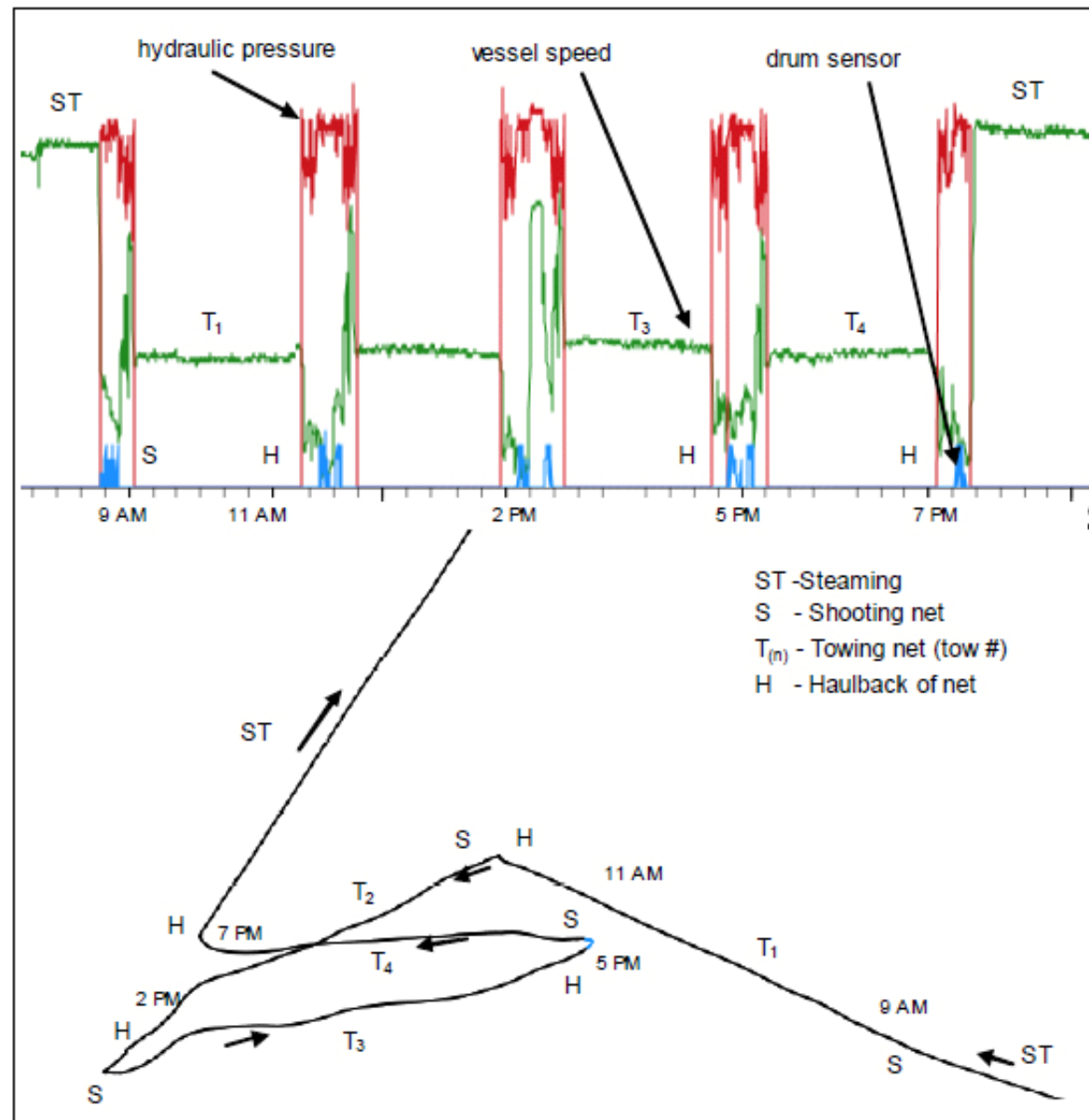
➤ **Explore the suitability and potential of EM!**

Potential of EM – trial in trawl



**McElderry, H.; Beck, M.; Pria, M.J.; Anderson, S.A. 2011.
Electronic monitoring in the New Zealand inshore trawl fishery - A pilot study.
Department of Conservation, Wellington, New Zealand.**

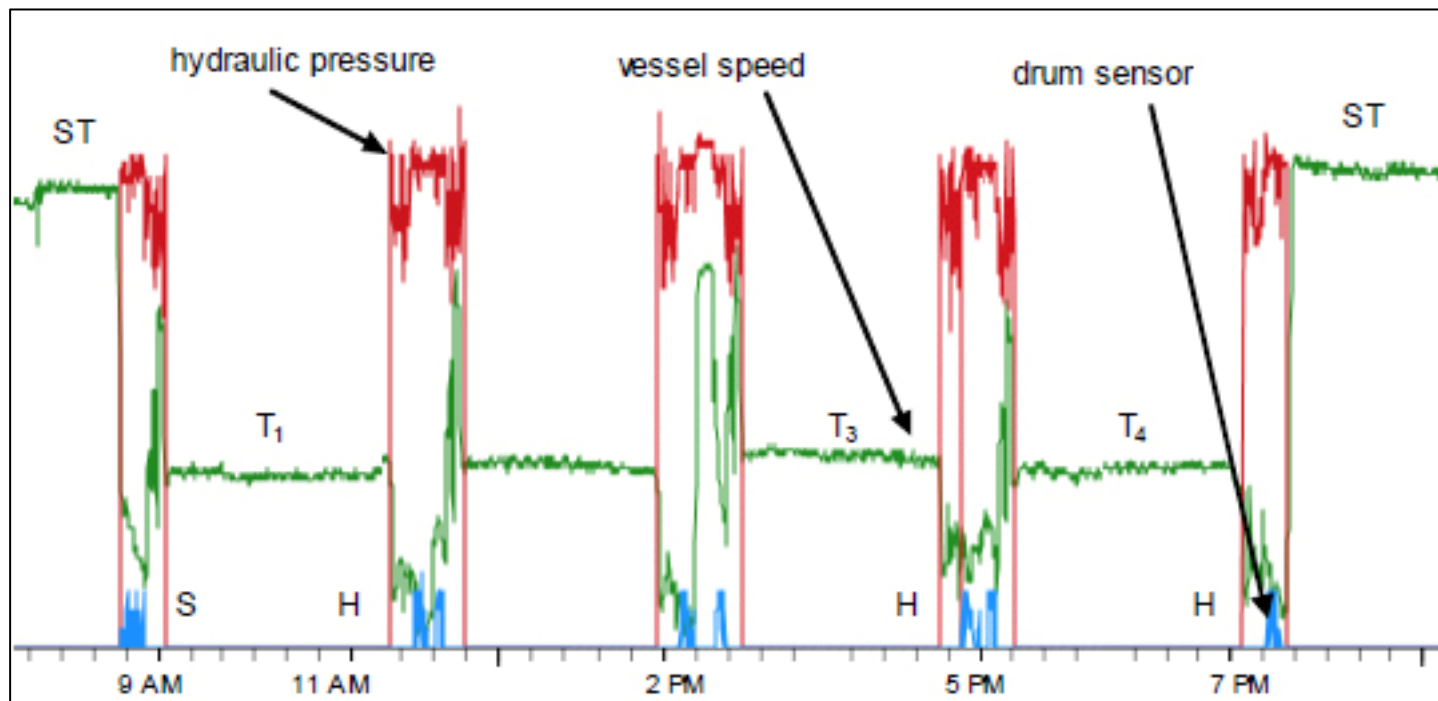
Potential of EM – trial in trawl



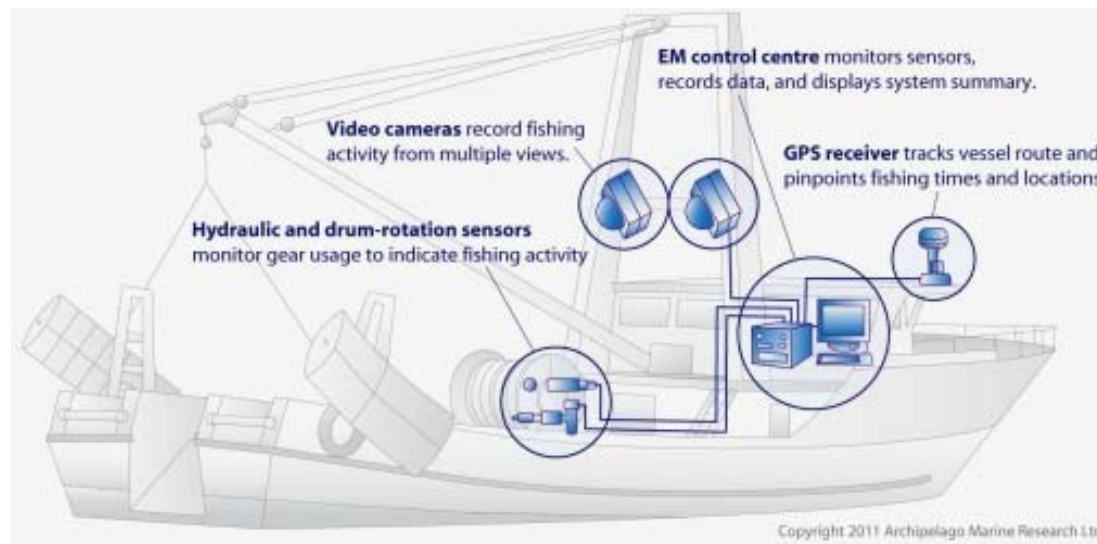
Potential of EM – set net!



A trial of EM in conjunction with an independent observer to validate observations and advance necessary adjustments for a permanent installation of EM on set netters.



Potential of EM – set net!



Only a robust set of data will allow development of effective mitigation measures or temporal/ spatial management to reduce yellow-eyed penguin bycatch!



“The **yellow-eyed penguin** is one of the two penguin species with the **most fragile conservation status on the planet.**

The international scientific and conservation community would greatly welcome and congratulate the Government of New Zealand **if they are instrumental in supporting research that can provide serious recommendations to address main conservation problems.”**

Pablo Garcia Borboroglu, CONICET, University of Washington,
Global Penguin Society



We need to cooperate for a sound risk assessment...



...and to develop mitigation measures...



©www.leaphotography.org

What is needed for a sound risk assessment:

- Operational details of capture:

gear, effort, timing, location, total time and depth of deployment.

GPS tracks of vessels operating in the SEC and SOU.

- Mortality rates & circumstances:

% juveniles vs adults.

% male vs female.

➤ **bycatch rates likely low
high observer coverage required!**

**What
about
EM?!**

