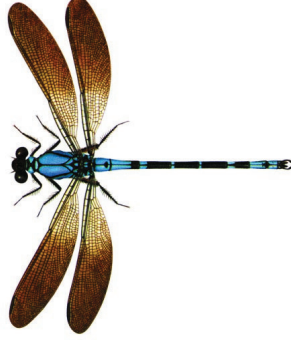


Seabird bycatch reduction in scampi trawl fisheries

MIT2011-02

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Conservation Services Programme Technical Working Group –
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Background

The fishery:

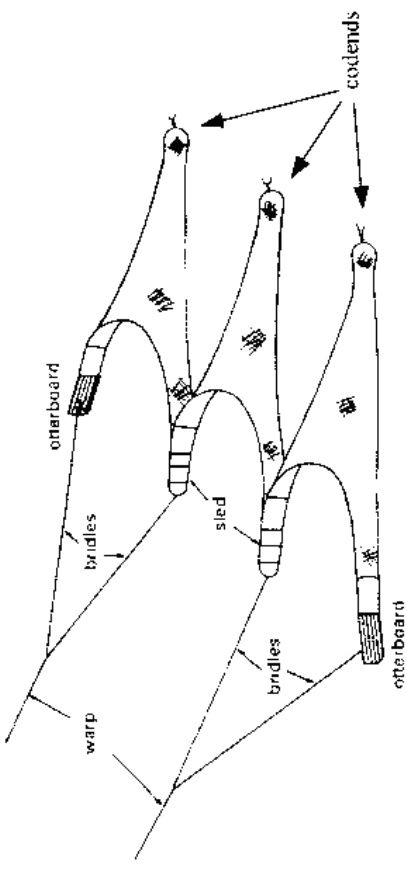
- Bottom trawl
- Bay of Plenty, Wairarapa Coast, Chatham Rise, Auckland Islands
- TACC 1190 tons
- Scampi = 20% of catch
- Fish and invertebrate bycatch = 80% of catch



Background

Gear and risk to seabirds:

- 1 or 2 warps
- 2 or 3 adjacent trawl nets
- nets hauled and emptied asynchronously
- nets on the surface for long periods during shooting and hauling
- mouth of centre net opens and closes at surface
- warp strikes
- net captures



Source: Sainsbury 1996



Background

- Second highest bird capture rate known from NZ trawl fisheries (excl. inshore)
- Capture rates vary from 1.02 - 16.04 birds per 100 tows
- Estimated total captures: 67 - 443 birds per year (95% CI, 2002/03-2010/11)
- Seabirds caught: albatrosses, petrels and shearwaters
- Includes species that may be bycaught in excess of sustainability limits (e.g., black petrel, Salvin's albatross)



Objectives

- to identify methods to mitigate the capture of seabirds in the commercial scampi trawl fishery
- to test the feasibility, and to the extent possible, the effectiveness, of methods to mitigate the capture of seabirds in the commercial scamp trawl fishery
- to make recommendations for future work to develop and/or test the effectiveness of methods to mitigate the capture of seabirds in the commercial scampi trawl fishery

Specific Objective 1

To identify methods to mitigate the capture of seabirds in the commercial scampi trawl fishery

- review of bycatch mitigation measures: trawl fisheries
- review existing NZ data from scampi fishery: fisher-reported and govt observers
- workshop with fishers, scientists, observers, fishery managers

Specific Objective 1: Review of previous research

- published and unpublished work
- shrimp trawl fisheries
- warp strikes: paired streamer lines
- net captures: net binding, weighting, cleaning
- discharge management



Photo: DOC/MPI

Specific Objective 1: Review of existing data

Fishery characterisation:

- MPI Warehouse database: catch-effort data
- data summary

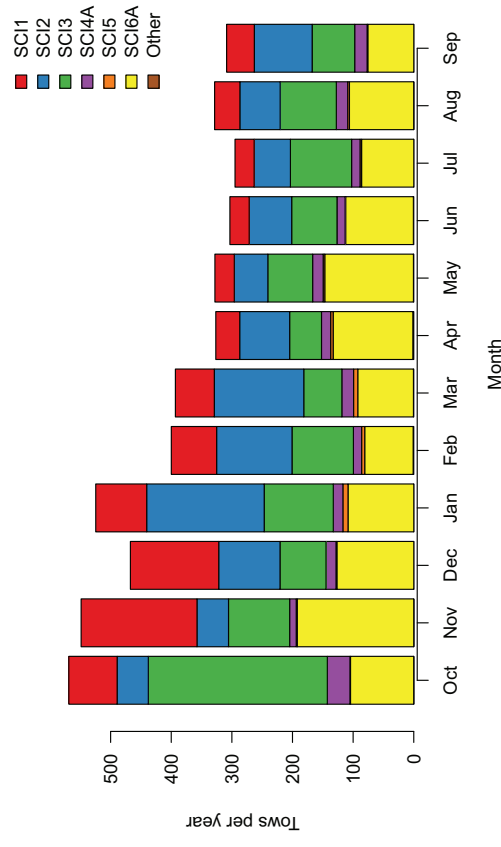
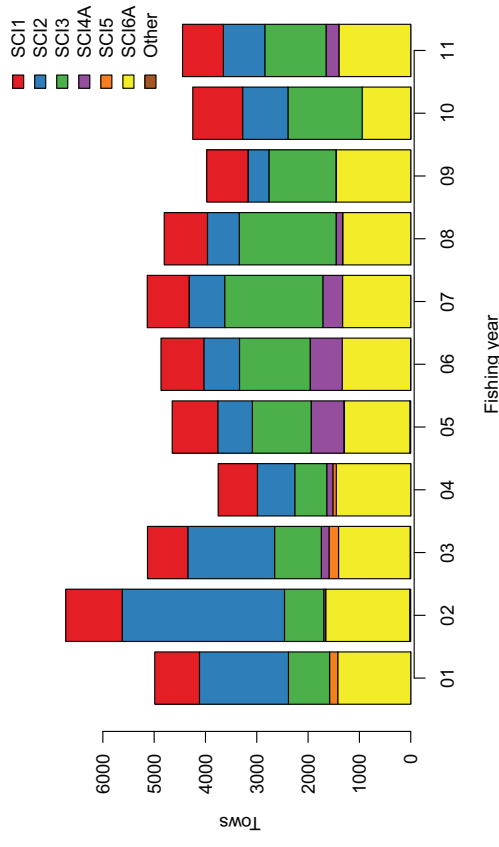
Seabird bycatch characterisation:

- MPI COD: government observer data
- Fisher-reported seabird captures
- CSP observer reports
- step analysis to explore risk factors related to seabird bycatch events

Specific Objective 1: Review of existing data

Fishery characterisation

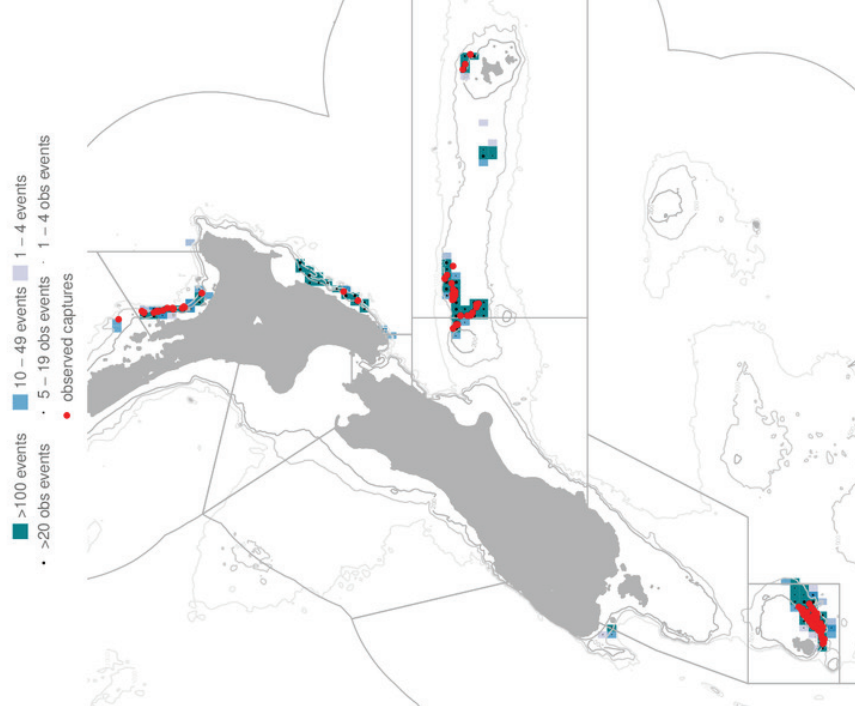
- 8 - 19 vessels
- reduction in vessel numbers under QMA
- 4,000 - 5,000 tows per year
- most effort October - January
- least effort April - September



Specific Objective 1: Review of existing data

Seabird bycatch characterisation

- observer coverage 3.08 - 12.05 % of tows, 2000/01-2010/11
- 78 trips, 15 vessels 2000/01-2010/11
- observed captures 5 - 86/year
- estimated captures 1.02 - 16.04/100 tows/year (95% CI)
- fisher reported captures 0.22 to 2.34/100 tows/year, 2001 - 2011
- albatross, petrel, and shearwater captures
- warp and net captures



Source:

<http://data.dragonfly.co.nz/psc/v20121101/>

Specific Objective 1: Review of existing data

Seabird bycatch characterisation: Step analysis

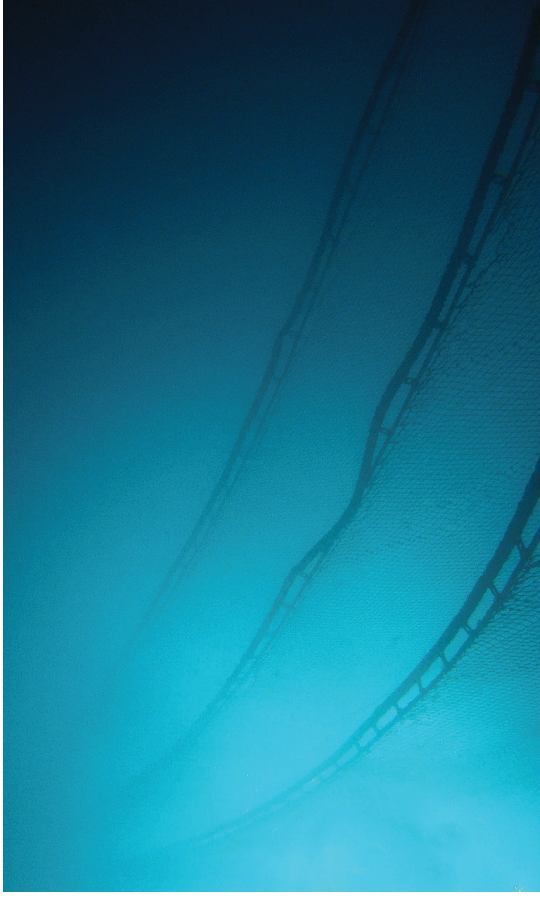
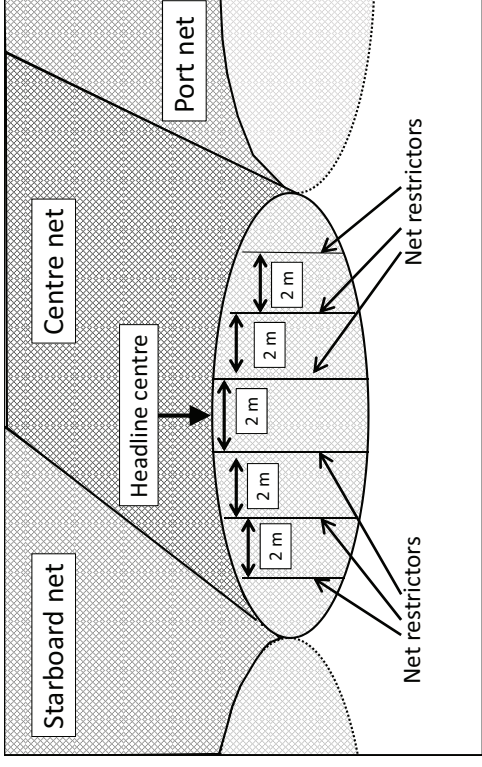
- all bird captures: month, QMA, number of codends (+), tori lines (-)
- Aug, Nov, Dec (-); SCI2, 3, 6A (-)
- albatross captures: number of codends (-), codend mesh size (+), tori lines (-), headline length (+)
- petrel/shearwater captures: number of codends (+), codend mesh size (+)
- results vulnerable to sporadic and patchy observer coverage

Specific Objective 1: Expert workshop

- seek feedback on risk factors identified from information review
- identify possible solutions to address risk factors
- identify additional information for observers to collect
- discuss potential new mitigation measures

Specific Objective 1: Conclusions

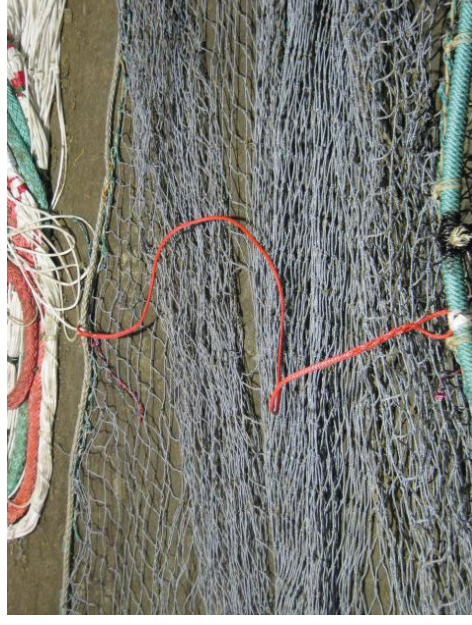
- mitigation not developed for shrimp fisheries
- limited observer cvg limits understanding of seabird bycatch
- discharge practices can improve: no discharge around shooting, hauling
- streamer lines can improve: aerial extent, construction
- continuing crew education
- novel bycatch reduction method: net restrictor



Specific Objective 2: At-sea testing of the restrictor

Feasibility

- tested for 3-4 months at sea
- reported to improve gear handling
- perception of reduced fish and invertebrate bycatch
- no effect on net form at fishing depth
- progression to experimental trials warranted



Specific Objective 2: At-sea testing of the restrictor

Results

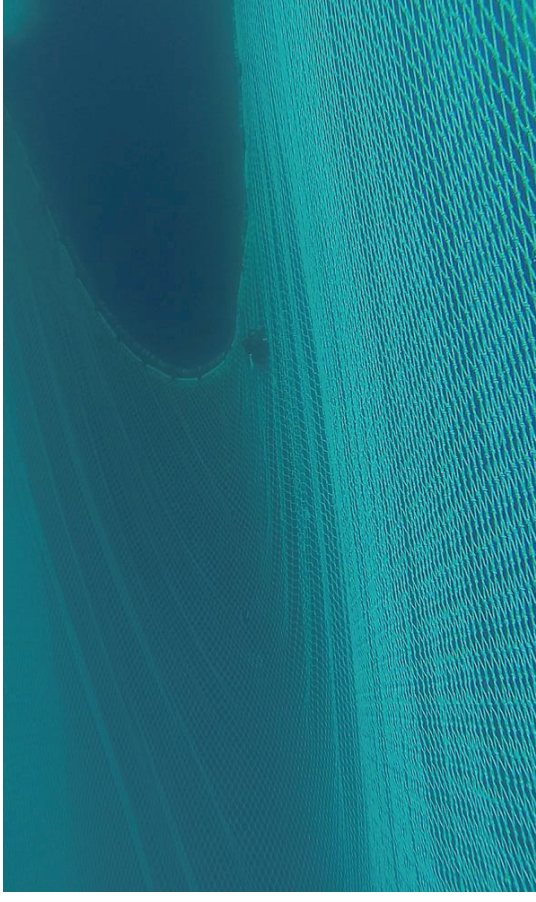
- one observed trip undertaken
- limitations on observer coverage precluded execution of experiment
- feasibility of experimental approach confirmed
- experimental approach documented for potential future use



Specific Objective 2: At-sea testing of the restrictor

Camera deployment

- restrictor deployment filmed during SCI6A survey
- two GoPro cameras: attached 1 m behind headline, groundrope of centre net
- net shot with 90 m sweep out to 48 m depth
- headline height determined using Furuno CN22 net monitor



Specific Objective 2: At-sea testing of the restrictor

Results

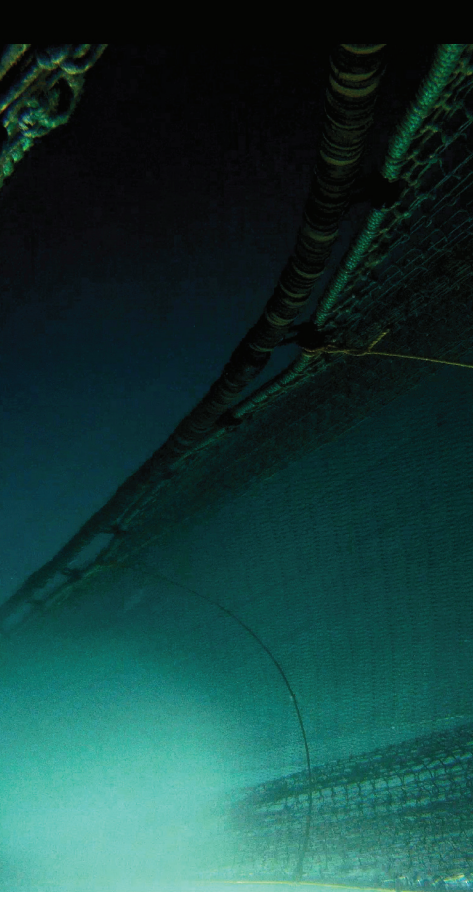
- shots depth-limited due to camera, but net configuration normal
- headline camera captured best imagery
- image quality from groundrope camera compromised by groundrope movement



Specific Objective 2: At-sea testing of the restrictor

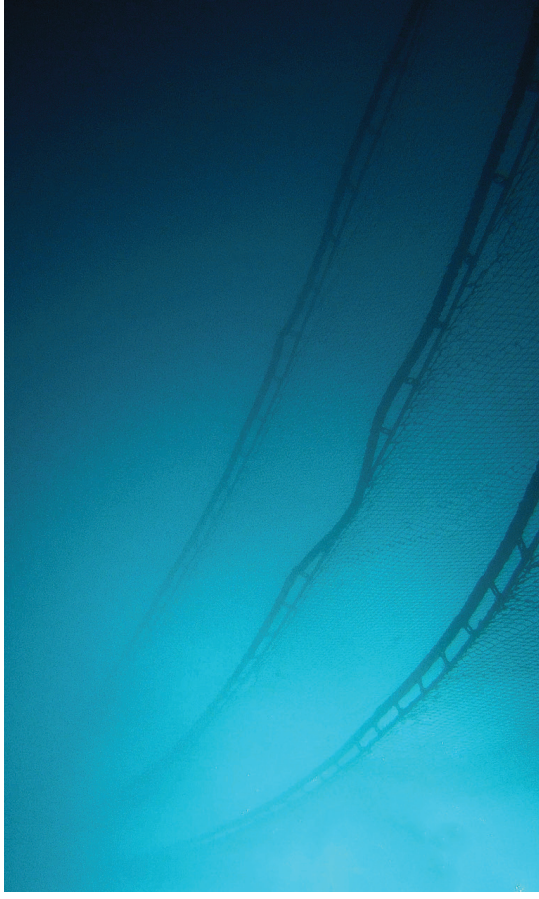
Restrictors fitted:

- height of centre net mouth: 1.0 - 1.2 m
- headline sat below water surface
- associated meshes below surface



Restrictors absent:

- height of centre net mouth: 4 - 4.5 m
- headline visible above surface
- associated meshes floated



Specific Objective 3: Recommendations for future work

- ensuring robust discharge practices
- improving tori line design and construction
- achievable with ongoing crew education, observer monitoring

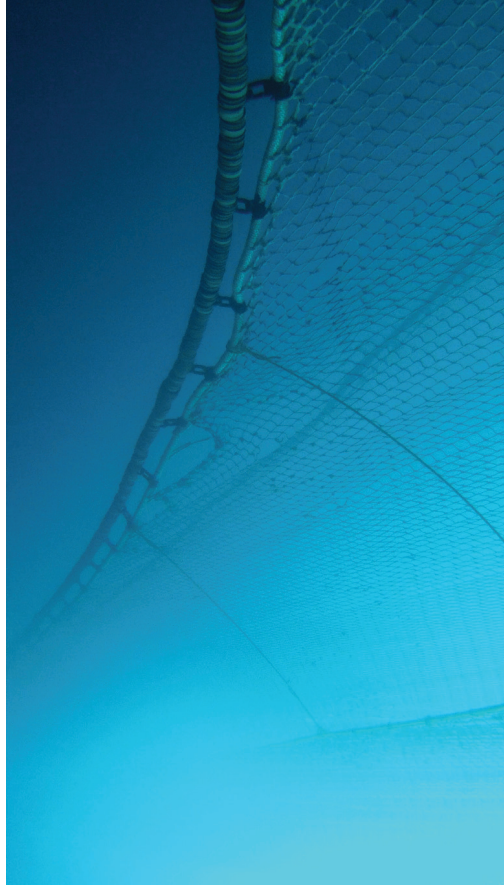


Photo: DOC/MPI

Specific Objective 3: Recommendations for future work

The restrictor:

- should not affect fishing gear at depth
- delivers perceived reduction fish and invertebrate bycatch
- improves gear handling
- is 'set and forget'
- addresses identified cause of seabird bycatch risk
- is a bycatch reduction method with significant potential



Specific Objective 3: Recommendations for future work

- assess efficacy of restrictor in reducing seabird captures
- document seabird catch in relation to restrictor use (ongoing basis, 5 years)



Photo: DOC/MPI

Acknowledgements

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