



The New Zealand Seafood Industry Council Ltd

Managing seabird incidental mortality in New Zealand's deepwater trawl fleet: creating individual vessel solutions in a fleet-wide approach, informed by experimental evidence

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Seabird mortality in trawl fisheries

- Seabird incidental mortality in fisheries has been apparent for about two decades (Croxall, 2012)
- Early focus on longline fisheries
 - Brothers (1991) albatross mortality in the Japanese longline fishery
 - FAO 1999 International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries
- Seabird mortality in trawl fisheries also recognised and addressed
 - Bartle (1991)
 - white capped albatross mortality in NZ southern squid trawl fishery
 - Netsonde cables considered primary cause
 - Use of netsonde cables prohibited in 1992



NZ squid trawl fishery

Limited attention to trawl fisheries in literature

- Bartle (1991) "Nearly all albatrosses were killed by collision with the netsonde monitor cable"
- Sullivan et al (2006) "provide the first detailed account of seabird mortality caused by collision with warp cables during trawling"

Brady Baffler development (www.southernseabirds.org¹)

- 1996 idea conceived
- 1999 prototype tested -Tomi Maru 86
 - On the *FV San Waitaki* "skipper Dave Webb found the baffler needed fine-tuning to better suit his vessel"
- 2003 adoption encouraged across the NZ deepwater fleet

• NZ NPOA - 2004

- Group One fisheries included the squid trawl fishery
- Required CoP developed and approved by 30 July 2004, and implemented by 1 October 2004



Need for a change in approach

• Squid fleet recall – May 2005

- Fisheries Minister "Benson-Pope reported that observations ... revealed that, contrary to the agreed code of practice:
 - 46% of the fishing fleet were not using equipment to scare sea birds away from vessels, with a further 8% only using it intermittently.
 - 30% of the fishing fleet were discharging offal (which attracts seabirds) while trawling or hauling nets, with a further 25% doing so intermittently.
 - Only 30% of the fishing fleet actually complied with both mitigation and offal management requirements"¹ of the CoP

Squid fishery Code of Practice

- ... had the right components
 - Mitigation measures
 - Offal management
- ... but was poorly implemented
 - Top-down approach
 - Lacked education and outreach to vessels



Responses

- Government
 - Mandatory use of warp-strike mitigation devices
 - Tori lines for trawl vessels \geq 28 m in southern part of the NZ EEZ
 - Bafflers and warp-scarers added
 - Considered mandatory offal management

• Industry

- Addressed implementation issues
- Development of vessel specific seabird management plans
 - VMPs = "Vessel Management Plans"
- Initially specified mitigation and offal management procedures
 - Later added reporting triggers
- Provided vessel-specific advice and training, translated where required – for foreign charter vessels



Concerns with regulations

Prescriptive/inflexible

- Must find the optimal "one size fits all" approach for
 - all vessels
 - all fisheries
 - all conditions
- Detailed specification vs. performance criteria

Incentives

- Causes vessels to focus on detailed compliance rather than effectiveness
- Discourages innovation or a risk management approach

Potential for health and safety issues

- Injury to crew
- Risk to vessels

Portability of results

- Tori line specification from the Falklands
- Supported by experimentation
- Appropriate to generalise?



Diversity of the NZ deepwater fleet

New Zealand factory fleet 2010/11



Also 7 – 10 fresher vessels > 28 m



A different approach to research

Standard NZ fisheries research

- Cost recovered from industry, largely contracted by Government
- Competitive tenders, single providers
- Rigorous, open peer-review

Alternative approach

- Co-operative and collaborative venture
 - Industry vessels, logistics
 - Government observers (data collection and audit)
 - Joint (industry/government/eNGO) technical advisory group design, oversight
 - Contracted analysis
- Retain standard Ministry peer-review process
- The alternative approach allowed
 - Responsive research design and implementation
 - Fleet-scale experimentation
 - Cost-effective projects based on pooled resources
 - Shared ownership, good buy-in



Fleet-wide experimentation (2006)

- Four treatments
 - Control
 - Tori-lines
 - Warp-scarers
 - Bafflers
- 18 trips
 - 7 with bafflers
 - 3 with 2 observers
- 3008 observations during 1086 tows





Results - offal

- Confirmed importance of discharge of fish processing waste
 - Affects seabird attendance at vessel





Results – mitigation devices



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Results – between vessel variation

Random-effects

- Low betweenobserver variation
- High betweenvessel variation
- Indications that
 baffler performance
 varies with block
 height





Results – between vessel variation

Between trip variation

- Large-bird contacts during no-mitigation observations
- Trips with bafflers were on vessels that tended to experience higher seabird strike rates





Results – between vessel variation





Outcomes

- Regulatory
 - Slight honing of warp strike mitigation device regulations
 - Three options
 - Offal management left to the VMP approach
- VMPs
 - Mitigation:
 - Embedded regulations
 - Back-ups, multiple devices when necessary
 - Offal management
 - Individual vessel engineering solutions
 - Innovative approaches
 - Mincing change nature of discharge
 - Batching change timing of discharge, reduce exposure



Experimental evidence

- Monitoring outcomes (i.e. trends in seabird mortality)
 - Is important
 - But is a poor basis for management decision making
 - Interested in long term trends, not short term noise
 - Long term trends are only ever revealed in the future
 - Can be misleading looking at year to year patterns
 - Need to look at the right things (absolute numbers vs. rates)

• Experimental evidence

- Provides confidence that the right measures are chosen to get the right outcomes (trends) in future
- Tested whether innovations offal management work
 - Provided a sound basis for VMP measures
 - Identified unexpected outcomes
 - Allowed rapid, iterative improvement



Successful experimentation

• Good design

• Randomised block

Appropriate measurements

- Seabird attendance at vessel vs. warp strikes
 - · Mitigation successful so warp strikes rare
 - Measuring correlates of risk, not actual risk
 - Rare events low statistical power
 - Removing mitigation
 - Artificial mitigation regulated
 - Lethal experimentation avoided
- Clear protocols
 - Numbers not comments
 - Consistent implementation
- Good sample sizes
 - Multiple tows, trips, vessels
 - Separate treatment effects from covariates
- Use of video
 - Poor for gathering measurements
 - Excellent for observation and interpretation, aided engineering
 - Why batching works (discharge vs. holding time; blobs vs. streams)



Successful VMPs

Iterative improvements

- Informed by experimentation
- On-going process

Flexibility

- Individual engineering solutions
 - Especially important for offal management in existing vessels
- Options for responding to conditions
 - Primary and secondary measures
 - Different areas, seasons, weather, production

Priority and commitment at the vessel level

- Risk management plan
- Similar approach and on-vessel status as:
 - Safe-ship management
 - Health and safety
 - Food safety

Vessel Management Plan (VMP)

Deepwater Factory Trawler over 28m

August 2009 • Version 4.0 •





Successful VMPs

"Don't be warped - trawl for fish, not birds"

From the desk of Admiral Albert Ross, MBE (Mighty Big Eater)

Government buy-in

- Observer audit role
- Assisted compliance with both regulatory and non-regulatory measures
- Now required as a permit condition for a large part of the fleet
- Socialisation of the problem to gain fleet and vessel buy-in
 - Vessel incident reporting is now routine
 - Can rely on receiving useful assistance in identifying causes and sorting problems
 - Incidents have lost their "mystery" (e.g. ALB net captures = offal incident during hauling)
 - Vessel process
 - Fleet processes

Support

- Education, liaison, outreach on-going, persistent, insistent
- Approval process, advice on improvements (taking into account individual vessel)
- Real-time reporting
 - Identify problems before incidents become disasters
 - Provide help to identify causes and solutions





