



Plastic loops and loopholes: is bait band legislation in Western Australia actually working?



Dr. Owen R. O'Shea and Heidi Taylor
Tangaroa Blue Foundation



Introduction

The use of plastics in commercial and recreational fishing has slowly increased over recent decades on account of its durability, low production costs and lightweight nature (Henderson 2001; Page 2004). The use of plastics in fishing has replaced natural fibers and as such has increased the frequency and severity of plastic based pollution resulting from the fishing industry (Henderson 2001; Page 2004). While the use of plastics has rapidly become standardised in both commercial and recreational fishing sectors, policy and legislation dealing with its negative impacts has had to keep up. This alignment with policy has been essential, as a major constituent of plastics in the ocean is derived from fishing activities and associated packaging (Derraik 2002), which is lost either incidentally or deliberately.

Illegal discharge of pollution to the marine environment is proscribed under Annex 5 of the International Convention for the Prevention of Pollution from Ships (MARPOL) now administered in over 150 countries. In Australia, this legislation is enforced by the Australian Maritime Safety Authority (AMSA), and applies to domestic and international vessels and fines of up to \$AUS 11 million may apply under certain circumstances. As far as fishing gear is concerned, any lost or discarded items are required by law to be retrieved, or recorded in the ships log where retrieval is not possible. Of these discarded plastics associated with the fishing industry, one of the most pervasive and hazardous is plastic strapping bands used to contain boxes of frozen fish used for bait (Figure 1). Strapping bands fulfill two functions whereby they secure bait boxes and allow easy carriage around the decks of vessels - something challenging in adverse sea conditions. Furthermore, the boxes tend to deteriorate rapidly as the baitfish defrosts, so strapping bands ensure these cardboard containers remain intact for longer.

In 2011, the Western Australian Fish Resources Management Regulations (1995) updated legislation that aimed to curb their use on vessels operating in west coast fisheries, in an attempt to reduce their prevalence in the oceans. Despite these efforts, certain exemptions are permissible under the law, allowing loopholes to be exploited and certain vessels operating within specific fisheries are still permitted to carry these



straps on board. The aims of this paper are to address this legislation and provide evidence of its failure to reduce the environmental impacts of strapping bands once lost to the ocean. More specifically, we present data from community based beach surveys where strapping bands are still found with alarming regularity along Western Australia's vast coastline. Furthermore, we discuss options and recommendations for amending this legislation, having spoken to many of the stakeholders involved, included commercial fishermen, bait processing factories and the state and federal governments.

Legislation

In Western Australia, Fish Resources Management Regulations (1995) No. 55 F states that:

- (1) Subject to subregulation (2), (3) and (4), the master of a boat being used for, or in connection with fishing must not cause or permit any bait bands to be on board the boat; Penalty: a fine of \$2,000**
- (2) Subregulation (1) does not does not apply in relation to a licensed carrier boat being used in the WCRL* Managed Fishery to transport fish taken with the use of another boat.
- (3) Subregulation (1) does not does not apply in relation to a boat that is authorised to be used for, or in common with the taking of rock lobster in the WCRL Managed Fishery if that boat –
 - (a) is being used in that fishery to transport bait from a licensed carrier boat to the Abrolhos Islands; or
 - (b) is a licensed fishing boat that is moored or anchored in that fishery not more than 800 m from the high water mark on the mainland or the Abrolhos Islands.
- (4) Subregulation (1) does not does not apply in relation to a boat being used in the WCRL Managed Fishery to transport –
 - (a) bait to or from a boat referred to in subregulation (3)(b);
or
 - (b) bait bands from a boat referred to in subregulation (3)(b)



* *West Coast Rock Lobster*

This regulation (55F) was inserted in Gazette on the 2nd November 2011 (p. 4623) and was implemented to assist in the mitigation of plastic strapping bands becoming marine debris.

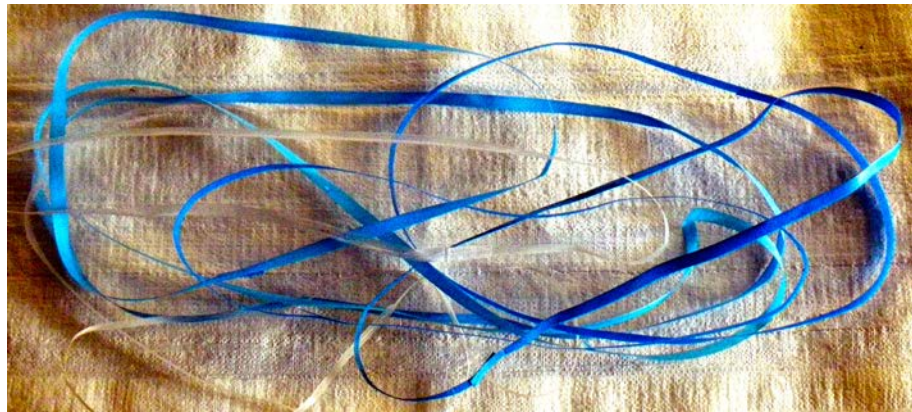


Figure 1: Plastic strapping bands used to seal and carry frozen bait boxes in commercial and recreational fisheries.

Interpreting the legislation

Fish Resources Management Regulations (1995) Nos. 55 F subregulation (1) clearly states that with the exception of three further subregulations, bait bands are not permitted on any commercial fishing boats in Western Australia. In order to understand these subregulations for the purpose of this paper, here is clarification of their interpretations (M. Cavanagh 2013, DoF, *pers. comm.*, 28th May)

- ***Subregulation (2) carrier boats:*** A vessel not fishing, but permitted to transport fish caught in the managed fishery by another, licensed vessel – in the case of regulation 55F this refers to the WCRL fishery only.
- ***Subregulation (3)(a) licensed carrier boats in the Abrolhos Islands:*** This is identical to subregulation (1) relating to carrier vessels but specifically related to the WCRL fishery in the Abrolhos Islands and allows bait boxes to be transported off of licensed carrier vessels. Examples of this would include taking bait boxes from a licensed carrier to a freezer facility on the islands themselves for storage; the type of vessel is not clarified (i.e. fishing or otherwise).



- ***Subregulation (3)(b) licensed fishing boat moored or anchored in that fishery not more than 800 m from the high-water mark on the mainland or the Abrolhos Islands:*** This permits bait strapping bands to be present on commercial fishing vessels in the specific fishery, if said vessel does not travel beyond 800 meters off shore. This means a vessel may keep bait boxes on board up to 800 meters off-shore IF it is anchored or moored, and therefore not fishing.
- ***Subregulation (4)(a):*** This means any vessel is permitted to carry bait boxes to a fishing vessel anchored or moored up to 800 meters offshore.
- ***Subregulation (4)(b):*** This is identical to the above, but relates specifically to bait bands themselves if they are being taken FROM a fishing vessel anchored or moored up to 800 meters offshore.

While exemptions relate only to the WCRL Fishery, all other fisheries operating in Western Australia that require bait fall under subregulation (1). These are the mackerel fishery, which operates from Broome to Darwin, wet line, long-line, trout, northern demersal scale-fish and 'trap' fisheries, which includes octopus, crab, blue-spot emperor, red snapper, goldband snapper, scarlet perch, red emperor, spangled emperor and rankin cod (Commonwealth of Australia 2004). It seems rather skewed considering only one fishery receives the perceived benefits of the exemptions, but in reality, the Pilbara trap fishery currently has two only boats operating and the northern demersal scale-fish fishery has only eight boats currently operating (N. Maggufie 2013, WAFIC, *pers. comm.*, 28th May). By contrast, the WCRL Fishery had 273 licensed vessels on the water from November 2011 to January 2013 (M. Rossbach 2013, DoF, *pers. comm.*, 28th May) encompassing three geographic zones from its northern boundary at the North-West Cape (Exmouth) to the southern boundary just off Cape Leuwin near Augusta.

Impacts

According to the National Oceanographic and Atmospheric Administration (NOAA),



looped materials are among the deadliest elements of marine debris because they can easily become wrapped around the neck of various taxa. This is most notable in marine mammals such as seals and sea lions; NOAA reports that in Alaska bait strapping bands are responsible in 50% of entanglements involving Steller sea lions. In Australia, pinnipeds are well documented as being impacted by bait strapping bands where entanglement by whole loops is recognised as a major cause of injury and often death (e.g. Shaughnessy 1980, Robison & Dennis 1998, Hanni & Pyle 2000, Henderson 2001, Hofmeyr *et al.* 2002, Arnould & Croxall 1995, Page *et al.* 2004). Pemberton and colleagues (1992) deduced that over a four year period, incidents of entanglements of Australian fur seals in Tasmania were caused by strapping bands from bait boxes in 23% of cases; second only to discarded nets (33%).

This issue isn't just confined to mammals; a range of other taxa are known casualties of discarded bait bands including turtles, birds, dolphins and sharks (McAuley 2000). Once the looped band becomes lodged, it is very difficult to be freed, as many of these animals do not possess the ability to swim backwards. This is particularly pertinent in young or sub-adult individuals, where growing may not be complete and horrific injuries and death are likely consequences - the animal grows and the plastic straps cuts into the creature (Figure 2).



Figure 2: Entangled ringed seal with a bait strapping band around its middle.
Photo courtesy of the Alaskan Department of Fishing and Game



In Australia, fur seals and sea lions are protected under Environment Protection and Biodiversity Conservation Act (1999) and under State and Territory legislation (Page *et al.* 200). This means that harming, removing or killing them is illegal, and entanglement by marine debris was recognised by Shaughnessy (1999) in the ‘Action Plan for Seals’ as being a significant threat. This report also states that of the 10 Australian Pinniped species, the subantarctic fur seal is classified as endangered, while the southern elephant seal is classified as vulnerable (IUCN 1994). The majority of these species are only considered conservation ‘low risk’ due to the isolation of their Antarctic habitats and minimal historical exploitation; however, those species reliant on habitat-specific conservation and management measures are vulnerable to increased pressures, or changes/reduction in conservation measures (Shaughnessy 1999), of which discarded strapping bands would surely fall under. The scale of these impacts on marine taxa is an international issue, with entanglement in synthetic marine debris widely thought to be a contributory factor in population declines of the Northern fur seal *Callorhinus ursinus* (Fowler 1987) and the now endangered Hawaiian monk seal *Monachus schauinslandi* (Henderson 1990). Attempting to mitigate these impacts by updating legislation is a good idea in theory, but it needs enforcement by regulatory bodies and an understanding of and cooperation from commercial fishermen. In addition, it seems prudent to extend legislation to producers of bait, so that there is law preventing plastic strapping bands leaving the factories – this would be simple to enforce and easier to ensure legislation pertaining to fishing vessels was being adhered to. Ultimately, this is likely to substantially eradicate the instances of plastic strapping band entanglements and general pollution.

Tangaroa Blue Foundation

Since 2004, the Tangaroa Blue Foundation (TBF) has been monitoring beaches and coastal environments across the whole of Australia and recording data on marine debris. To date, almost 1.6 million pieces of debris have been removed, recorded and disposed of properly from 700 beaches, including 221 sites across Western Australia.





Plastic strapping bands have been a consistent and numerically abundant component of debris sourced from West Australian beaches and have been found at 94% of beaches surveyed (207). Since 2004, TBF has removed 5,528 strapping bands from 207 separate beaches across 12 broader geographic regions in Western Australia, and interestingly, close to 100% of these strapping bands were recovered in regions where the WCRL fishery operates (99.6%) (Figure 3).

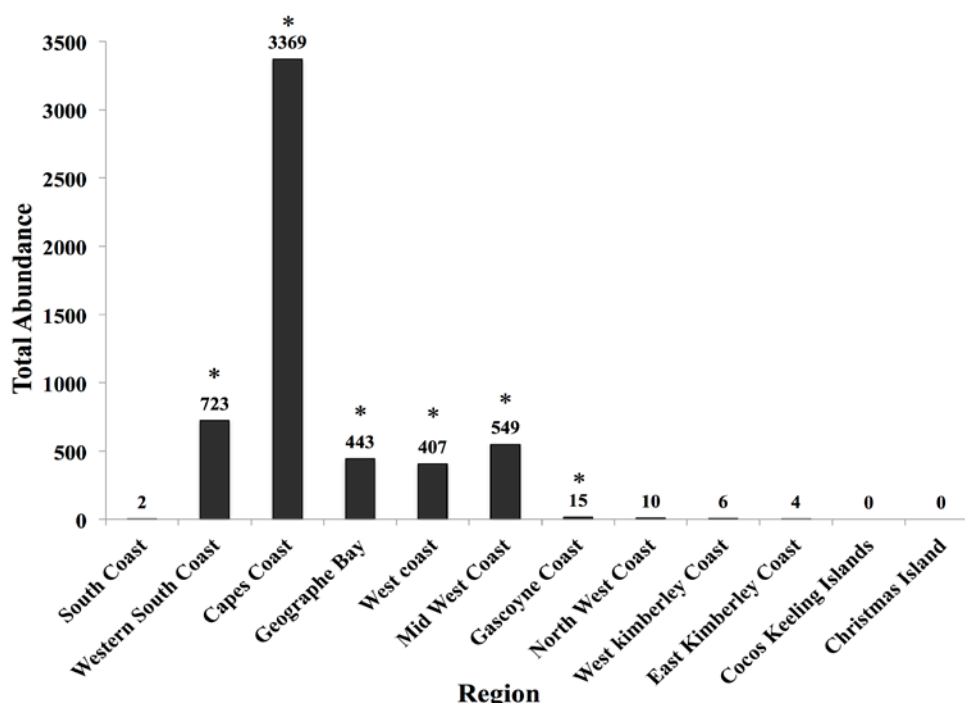


Figure 3: Total abundance of strapping bands recovered by TBF since 2004 across 12 broad geographic locations encompassing 207 individual sites. * Regions within the WCRL fishery

Through the tireless efforts of several thousand West Australian volunteers, the TBF has been able to assess trends in frequency and abundance of strapping bands from beaches and coastal environments across the whole state. It is entirely possible that the Tangaroa Blue Foundation are exclusive custodians of data that may indicate whether this legislation is working or not (Figure 4). Most of these data collected are from blue bait strapping bands and occasionally clear ones as pictured on the cover page. According to WAFIC, in Western Australia the majority of strapping bands are blue with a small percentage being clear and any other coloured bands are typically



from South East Asia; this includes orange and yellow straps (N. Maggufie 2013, WAFIC, *pers. comm.*, 28th May). With this in mind, TBF data should be treated as independent from any fishery sources and it is acknowledged that while some of these bands are likely originating from WA fisheries, it is entirely likely that an as yet undetermined percentage will have come from international fisheries.

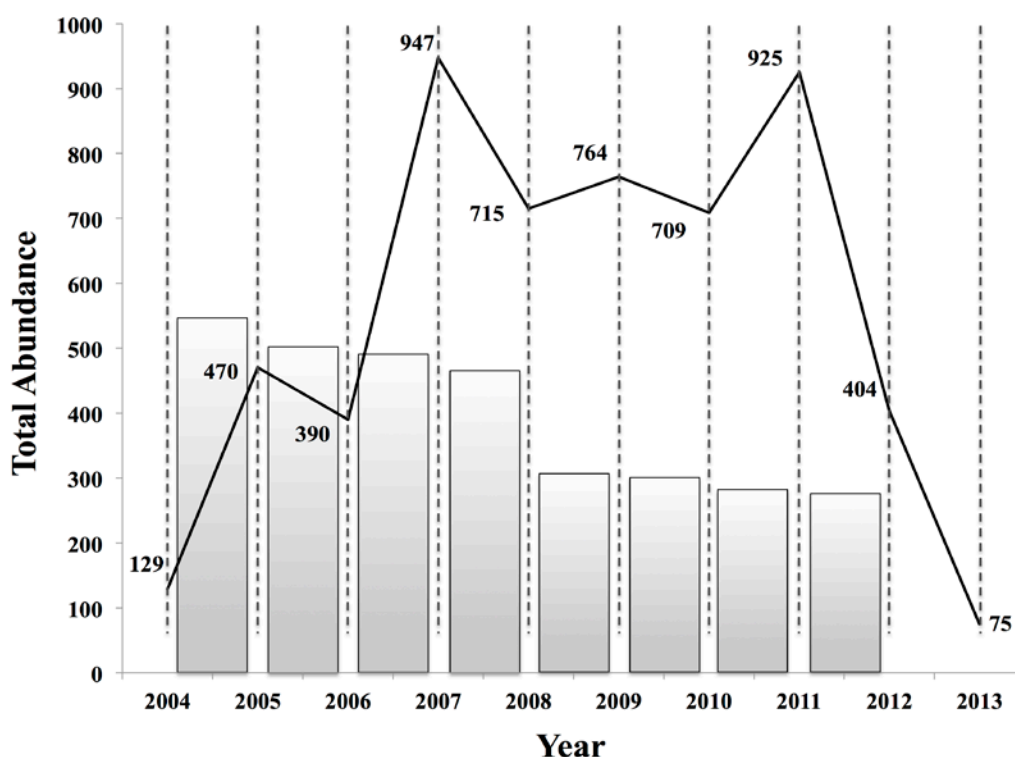


Figure 4: Total abundance of strapping bands recovered by TBF for each year since 2004 in Western Australia. Numbers represent bands for that year while the grey bars represent the number of vessels operating in the WCRL fishery for that corresponding period. All data is current as of May 2013. WCRL data sourced from DoF annual WCRL fisheries management reports

While catch rates and licensed vessels operating within the WCRL fishery have declined since 2004 (DoF 2012) (Supplementary Table I), it is possible that effort may have increased to improve quotas (e.g. longer hours at sea, more traps, higher turnover and re-deployment of traps), which in turn could result in an increase of bait use and therefore of discarded strapping bands. While this is speculation, historical catch rates show such a decline, justifying a greater effort for vessels to attain realistic



quotas. Despite data on strapping bands as marine debris collected by the TBF showing a decline *after* the 2011 legislation was introduced; there were still 404 bands found in 2012 and this is enough to suggest that loopholes within this legislation is being exploited, or ignored completely.

Who is responsible?

The main issue with any legislation is enforcement and this is no different - no one organisation appears to be taking responsibility. During the research for this paper, the author contacted the Western Australian Fishing Industries Council (WAFIC), the Western Australian Department of Fisheries (DoF) (Head office, policy and research), the Western Australian Department of Environment and Conservation (DEC), the Australian Maritime Safety Authority (AMSA) and the offices of both the outgoing Fisheries Minister (Norman Moore) and the newly appointed incoming Minister (Troy Buswell). While AMSA were very helpful in detailing policy for plastics pollution, there is no Commonwealth legislation that deals with this issue on a national level. It seems that the organisation responsible for creating the legislation are the ones responsible for enforcing it, so in this case, marine officers from the Department of Fisheries; although upon contacting the DoF it was unclear as to whether this is a priority area. Certain marine park rangers within DEC are also trained and permitted to enforce policy and legislations from 'crossover' agencies but when it comes to the issue of plastic straps from bait boxes, representatives of these agencies were hesitant to discuss it.

Due to the abundance and frequency of strapping bands still being recovered from Western Australian beaches, it seems clear that despite this legislation being in place for over two years, it isn't working. There are several possible reasons for this and each needs to be assessed in order to identify where improvements can be made:

- **Re-defining the legislation:** The legislation was introduced to reduce the environmental impact of lost and discarded strapping bands to the marine environment; however a major flaw still exists that needs to be addressed.



Currently, legislation allows strapping bands on licensed carrier vessels anywhere within coastal waters servicing fishing boats within the WCRL fishery and fishing vessels if they are no more than 800 m offshore, moored or at anchor, including at port. These ‘loopholes’ or exemptions seem counterintuitive, as it does not prevent loss to the environment, whether deliberate or accidental if they are still permissible on vessels on the water. How does being moored 800 meters offshore prevent incursion to the marine environment if strapping bands are improperly disposed of?

- **Enforcement:** There needs to be defined and transparent protocols in place for regular monitoring of all vessels fishing in State waters to enforce this legislation and levy the fines that apply (\$2,000). While AMSA can impose fines under MARPOL legislation for improper disposal of plastics at sea, an agency needs to take responsibility for ensuring that a deterrent is in place preventing their occurrence on unlicensed vessels in the first place.
- **Tougher penalties:** Under MARPOL legislation, ship owners responsible for inappropriate disposal of plastics at sea can be fined up to \$1.7 million and a ship’s master or individual can be fined up to \$340,000. In contrast, the fine of \$2,000 for contravening this legislation is possibly not incentive enough to prevent the occurrence of strapping bands on fishing vessels.
- **Factory level:** As part of the research for this paper, several bait processing factories and plants were contacted and interviewed about the plastic strapping band issue. Currently there is no legislation that deals with the manufacture of bait and their containment, so manufacturers continue to use the strapping bands, making it the fishermen’s sole responsibility to do the right thing. The general feeling among manufacturers was that these bands are critical for carrying bait boxes around the deck of a fishing boat and therefore they would not support a move to ban or replace them. Furthermore, from a financial perspective, the margins that bait processing plants make on each 20 kg bait box is usually cents, therefore the cost to re-develop and manufacture



alternative boxes without strapping bands just isn't economically viable, and therefore there is zero motivation for doing so.

- **Adequate disposal/recycling facilities at port:** Local fishermen were also interviewed at Fishing Boat Harbor, Fremantle about strapping bands and they all agreed that there needs to be more disposal or recycling facilities at port and improved facilities at port may help eradicate this issue
- **Buy back for whole straps:** If discarded plastic has value, it no longer become debris – it may be possible to offer incentives on straps. Even cut straps can be recycled, and a possible move to discount future bait purchases upon the return of strapping bands to factory might possibly work.
- **Redesign of boxes based on comments from fishermen:** Ultimately, these strapping bands increase the safety and ease of transport around often unstable and wet deck areas on vessels. Redesigning straps to be degradable is a preferred course of action over removing them due to OH&S issues. In 2012 certain fisheries were applying for further exemptions in the legislation due to this issue – bands being removed from bait boxes at port or the carrier vessels before transference to the fishing vessel was raised as a genuine OH&S concern. Nothing so far has come of it, but the issue is alive and legislation possibly ignored based on these safety concerns.

Conclusions

There is certainly evidence of the continued use of bait bands on commercial fishing vessels, and improper disposal practices on board fishing and carrier vessels. This is evidenced by the continued discovery of strapping bands on WA beaches, with close to 100% of sites falling within habitats adjacent to the greatest consumer of packaged bait. In addition, TBF has obtained evidence of this legislation being flaunted and has documented proof of commercial fishing vessels operating within the WCRL fishery carrying bait boxes, secured with plastic strapping bands on board. It seems likely that the use of strapping bands on bait boxes will continue unless the legislation is



amended or alternative solutions are explored to mitigate their impact on the marine environment.

West Australian agencies responsible for creating and enforcing legislation need to address this issue urgently, instead of skirting around it and assuming it isn't their responsibility. The WCRL fishery is worth hundreds of million dollars to the local economy every year and is the first fishery in the world to be certified as sustainable for three years running and therefore its importance cannot be understated. It is possible that for this reason, loopholes are exploited without recrimination because it is just too big a fishery to interfere with. This of course is an opinion, but the fact remains, loopholes are open allowing strapping bands on various vessels in West coast fisheries and due to the remote and extensive nature of Western Australia coastline, policing and enforcement is a low priority, allowing this practice to occur causing untold damage to our wildlife. These issues demand the urgent attention of the Honorable Troy Buswell, WA Minister for Fisheries, whose office so far, has failed to comment on our intentions in preparing this report.

Acknowledgments

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Appendix

Supplementary Table I: Catch rates and total number of licensed vessels on the water in the Western Rock Lobster Fishery since 2004. * *Data from November 2011 – January 2013*; ***catch data for the period November 2011 – May 2013*

Period	Total WCRL Catch (T)	Total Vessels Fishing
2004/05	12141	535
2005/06	12138	500
2006/07	10326	491
2007/08	8612	460
2008/09	8926	306
2009/10	7595	297
2010/11	5899	279
2011 – 2013*	8942**	273