



## *Non-lethal options for mitigating catch depredation by toothed whales from pelagic longlines*

### **Update #6 – July 2010: PDMD Progress**

- Find this and other related documents at: <http://www.marinemammals.gov.au/regional-initiatives/depredation-project>
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#### **6.1 *Physical Depredation Mitigation Device (PDMD) progress***

As you may remember, the PDMD concept we are developing is designed to physically deter depredating toothed whales, under the assumption that they avoid tangled longline gear. Given that pelagic longlines remain within the reach of diving whales the entire time they are in the water (unlike demersal longlines that are typically only accessible to depredating whales when the gear is being hauled), it is necessary to design a PDMD to lay dormant to allow the baited hook to fish normally and then to become active and protect the fish once it is caught. This requires the use of triggers and moving parts. Both provide a challenge, given that the marine environment is harsh and that the large tunas and billfishes that are typically caught can be tough on the equipment. Following is a brief report on the progress of the PDMDs we are focusing our research efforts on, which we hope will provide a solution or at least mitigate this problem.

The first PDMD is known as the *Tuna Guard – Streamer Pod* and has been developed and produced as part of a collaboration between the Australian Marine Mammal Centre (AMMC) and UK gear technologist Fishtek Marine (Moretonhampstead, Devedon, UK; <http://fishtekmarine.com>). The *Tuna Guard – Streamer Pod* is complex in design and has specialised, prefabricated components and moving parts (Figures 12 and 13). The idea is that a number of strands of fishing line or fine chain dangle next to the fish and imitate tangled fishing gear, which it is thought will deter the depredating whales. In general, we have worked extensively to ensure that the overall design meets the criteria set out in Update #2.

Two other PDMD designs are also being considered. The *Whale Shield – Octopus* (Figure 14) offers a simpler design that may be more cost effective for fishers in the long term, because it can be made by crew on the vessel, using existing fishing gear and a few additional and cheap components. In contrast, the *Whale Shield – Jellyfish* is a more complex design, which is designed to utilise similar functional principals to *Tuna Guard – Streamer Pod* and the ‘net sleeve’ in the Patagonian toothfish fishery (Moreno et al., 2008) to fully shroud the caught fish. Although still in the concept phase, we are hoping to develop these two ideas and include them in future sea trials.

## 6.2 References

Moreno, C.A., Castro, R., Mujica, L.J. & Reyes, P. (2008) Significant conservation benefits obtained from the use of a new fishing gear in the Chilean Patagonian toothfish fishery. *CCAMLR Science*, **15**, 79-91.

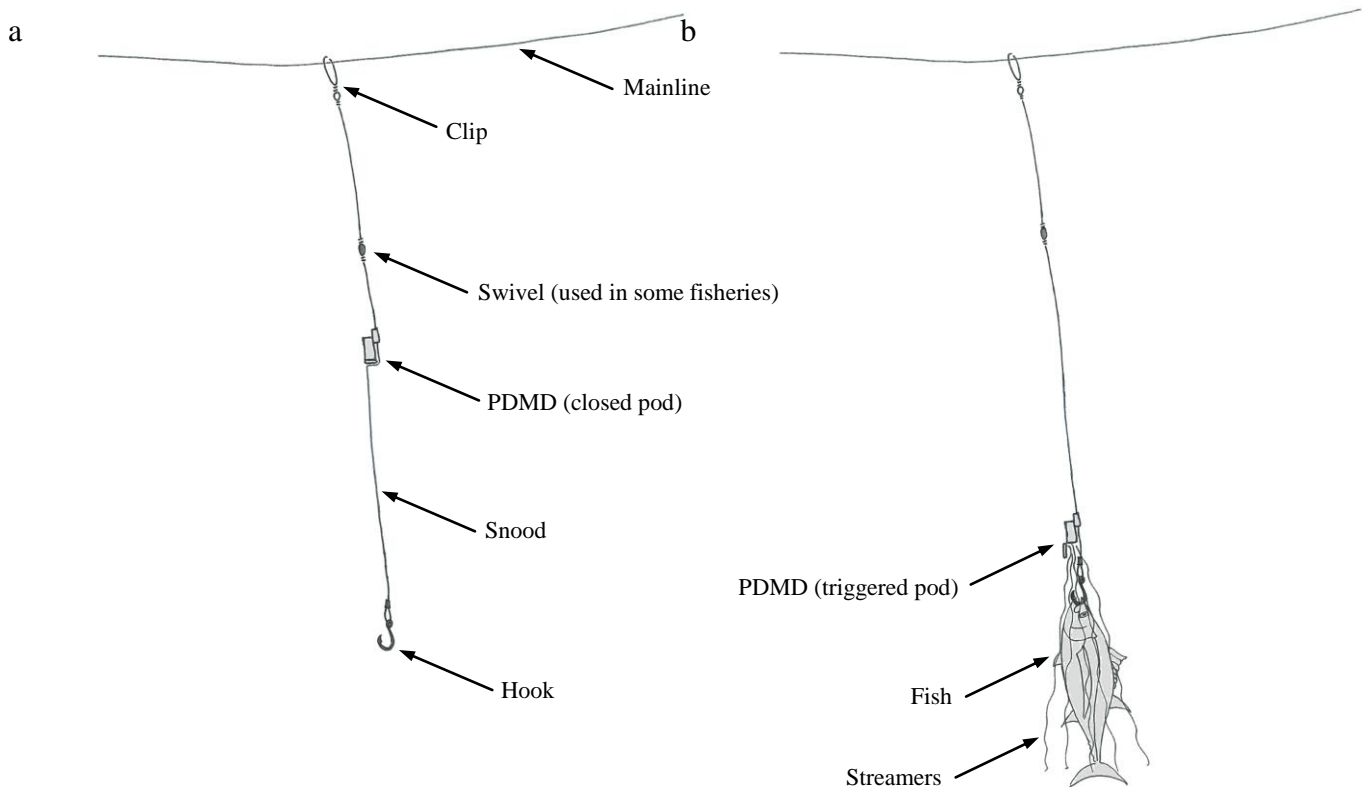


Figure 12 Schematic diagram of *Tuna Guard – Streamer Pod* PDMD being developed to deter toothed whales from depredating catch on pelagic longlines, by Fishtek Marine and the Australian Marine Mammal Centre (AMMC). The device remains clear of the baited hook (a) until a fish is caught (b). The pressure of the caught fish fighting against the hook causes the cap of the pod to open and release the streamers, and the device to descend the snood toward the hook.

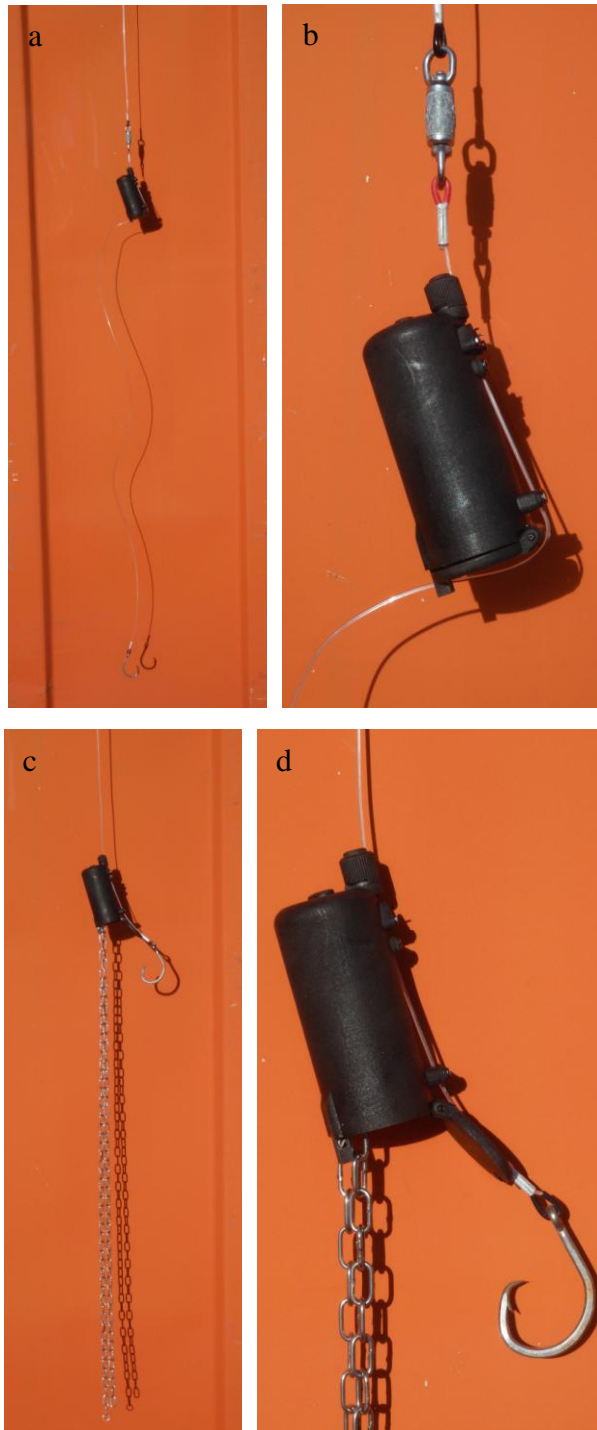


Figure 13 An early prototype of the *Streamer Pod* PDMD being developed to deter toothed whales from depredating catch on pelagic longlines, by Fishtek UK and the Australian Marine Mammal Centre (AMMC). In this example, the *Pod* is located under the swivel some 3 metres above the hook (a and b) until a fish is caught (c and d). The pressure of the caught fish fighting against the hook causes the cap of the pod to open and release the chains, and the *Pod* to descend the snood toward the hook.

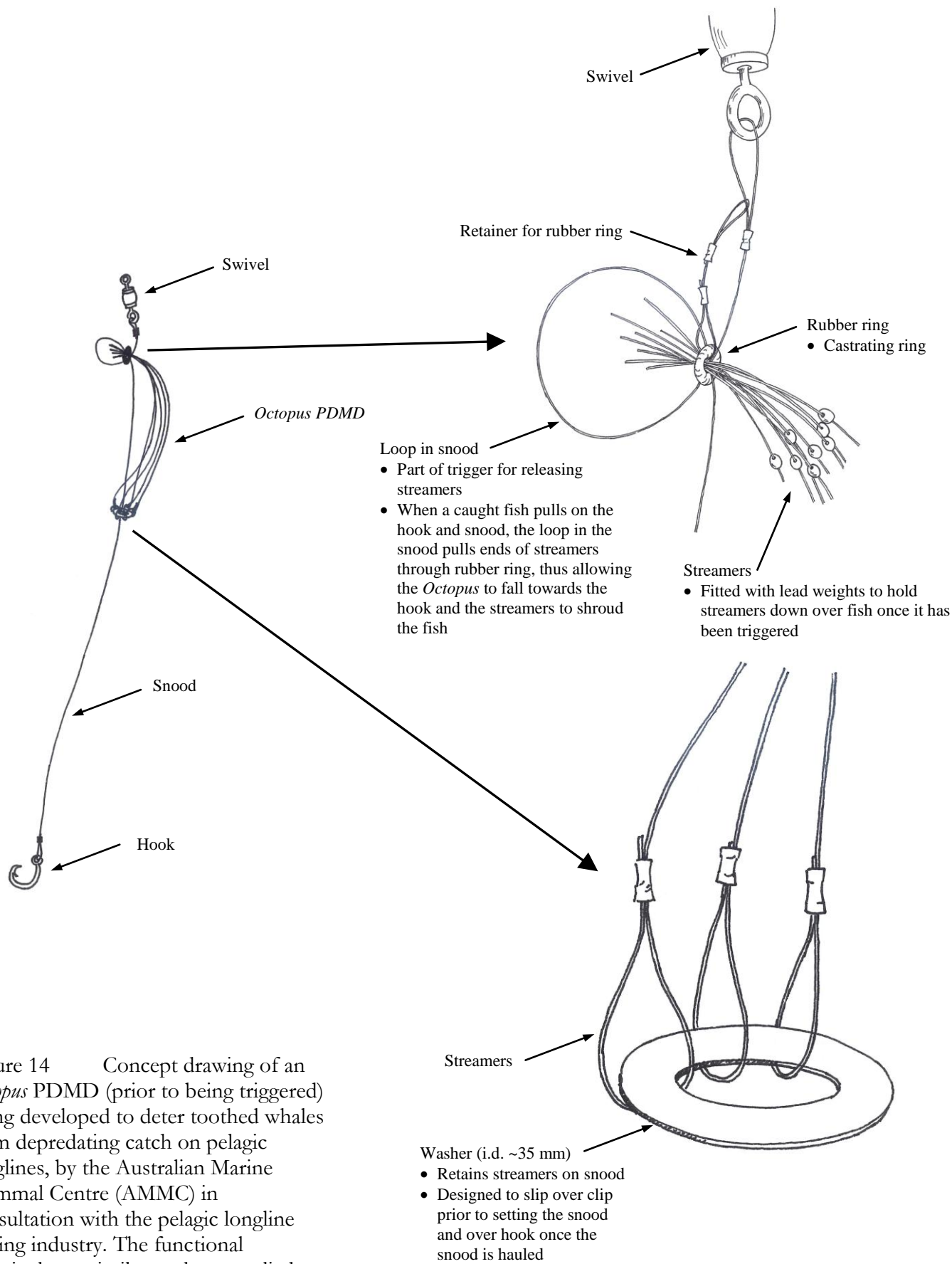


Figure 14 Concept drawing of an *Octopus* PDMD (prior to being triggered) being developed to deter toothed whales from depredating catch on pelagic longlines, by the Australian Marine Mammal Centre (AMMC) in consultation with the pelagic longline fishing industry. The functional principals are similar to those applied to the *Streamer Pod*.