Department of Primary Industries

NSW SHARK MESHING (BATHER PROTECTION) PROGRAM

Trigger point review report (2015-16)

July 2017

1. Common Dolphin entanglements

Trigger point description

The trigger point for this objective is: *entanglements of non-target species and threatened species over two consecutive meshing seasons exceed twice the annual average catch of the preceding 10 years for those species*.

The entanglement (and subsequent death) of four Common Dolphins (*Delphinus delphis*) during the 2015-16 meshing season tripped the trigger point for threatened species entanglements, as it was preceded by three entanglements in the 2014-15 meshing season.

Common Dolphin captures in the NSW Shark Meshing (Bather Protection) Program (SMP) have historically varied between zero and four captures per annum (10 year annual average is 1.4 Common Dolphin captures).

Common dolphins are generally considered an offshore species and are listed as Least Concern by the IUCN (IUCN Red list of Threatened Species, 2016.4 list) and as Data Deficient by the 2012 action plan for Australian Mammals. Common Dolphins have been recorded in waters off all Australian states and territories, and it is unlikely that the populations are severely fragmented (Department of Environment, 2017). There are no population estimates for *Delphinus* off the Australian east coast.

Three of the four Common Dolphins caught were retained and provided to the Taronga Zoo for necropsy and accessioning of specimens into the Australian Registry of Wildlife Heath.

The fourth animal, from the Central Coast South, was not retained as it was found decomposed after contractors were unable to check nets due to inclement sea conditions.

Site description

The shark nets at all four beaches are bottom-set in between 10-12m water depth and approximately 500m offshore. Each net is 150m long by 6m deep. As they are set parallel to and relatively close to the shore, they are less likely to be encountered by Common Dolphins. Each net in the SMP is fitted with cetacean acoustic deterrent devices. These include three high-frequency (70kHz) dolphin ‘pingers’ and two low frequency (3kHz) whale ‘alarms’ set in an alternating arrangement 25m apart and 25m from the end of each net. The devices were reportedly operational upon checking shortly after each of the four entanglements.

Incident review

Each of the four captures were individual events and spread between the Hunter and Sydney beaches during the summer months.

Analysis of catches in the regions at the time of these Common Dolphin captures does not show any trend regarding other pelagic species captures. It is therefore unlikely that unusual environmental conditions may have led to this species being found closer to shore.

The 70kHz 145dB dolphin pingers were installed and active at the time of each of the captures. These new, higher frequency, pingers are designed to emit sounds more central to delphinid audibility curve (https://futureoceans.com/product/future-oceans-70-khz-dolphin-pinger)

Conclusions

Although the trigger point was tripped following the capture of these four Common Dolphins, the number caught is within the range of animals captured in previous years and was likely primarily due to two consecutive years of greater than three captures.

The SMP has maintained an active policy of ensuring dolphin pingers are attached to the nets, one of the most complex analyses has been to determine their efficacy at reducing dolphin catches as catch rates are inevitably low in coastal gillnet fisheries such as the SMP (see Erbe et al., 2016).

There are currently no alternative pingers with substantial differences in auditory output and that can be effectively managed via the current contract arrangements of the SMP. As such, it is considered most prudent to continue the use of these new 70kHz pingers to enable assessment of the catch rate in comparison to the previous years of 10kHz pinger deployment.

The NSW SMP nets have caught fewer Common Dolphins than either of the Queensland (https://data.qld.gov.au/dataset/shark-control-program-non-target-statistics-by-year) or South African (Cliff and Dudley 2011) shark control programs.

Recommendations

Although it is unlikely that the current rate of SMP-induced fatality of Common Dolphins will negatively affect the population, it is important that ongoing efforts to reduce any bycatch through use of active acoustic deterrents and/or other new bycatch mitigation measures be continually re-assessed.

References

Cliff, G. and Dudley S.F.J. 2011. Reducing the environmental impact of shark-control programs: A case study from KwaZulu-Natal, South Africa. Marine and Freshwater Research, 62: 700-709.

Department of the Environment. 2017. *Delphinus delphis* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed Thu, 6 Jul 2017 16:02:42 +1000.

Erbe, C., Wintner, S., Dudley, S.F.J. and Plon, S. 2016. Revisiting acoustic deterrent devices: Long-term by-catch data from South Africa's bather protection nets. Proceedings of Meetings on Acoustics, 27 DOI: 10.1121/2.0000306.

2. Transparent Monitoring and Reporting

Trigger point description

The SMP Joint Management Agreements (JMAs) and associated Management Plan require an Annual Performance Report (APR) to be prepared and submitted to the parties to the JMAs and the two scientific committees by 31 July each year (i.e. three months after the conclusion of the meshing season). The 2015-16 APR did not fulfil those requirements as it was not submitted to the parties and the committees by the required date, triggering a review report for the 'transparent monitoring and reporting' objective.

Incident review

The 2015-16 meshing season saw continued public interest in the SMP following numerous shark sightings and several serious interactions with White Sharks along the NSW coastline. Activist groups, the media and some local governments continuously sought access to documents, departmental staff, the Minister and the Premier, putting considerable strain on the departmental resources normally available to prepare the APR.

A single program manager for the SMP was not in place at the time to oversee the preparation of the APR. The 2015-16 APR was a collaborative effort by the compliance, science and conservation units of DPI Fisheries. The resourcing issue was compounded in the 2015-16 meshing season with a higher than usual number of animals being caught in the SMP.

Under-resourcing appears to be the single cause of the delayed submission of the 2015-16 APR. The absence of an SMP program manager meant that other departmental resources were diverted in a

relatively ad hoc fashion to cover the tasks and functions associated with the management of the SMP, JMAs and Management Plan.

A full-time, dedicated Shark Meshing Program Supervisor was employed in November 2016 to manage the SMP in an ongoing capacity, supported by Fisheries Technician staff.

Conclusion

The review notes an issue with under-resourcing affecting the timeliness of reporting on the SMP in 2015-16. This has been addressed with the appointment of a full-time, dedicated Shark Meshing Program Supervisor in November 2016, which will assist in ensuring the timely reporting on SMP outcomes relating to the JMAs and Management Plan.

3. Hawksbill Turtle entanglements

Trigger point description

The trigger point for this objective is: *entanglements of non-target species and threatened species over two consecutive meshing seasons exceed twice the annual average catch of the preceding 10 years for those species*.

The entanglement (and subsequent death) of five Hawksbill Turtles (*Eretmochelys imbricata*) during the 2015-16 meshing season tripped the trigger point for threatened species entanglements, as it was preceded by a single entanglement in the 2014-15 meshing season after a decade of no reported catches for this species.

All of the five Hawksbill Turtles caught were retained and provided to the Taronga Zoo for necropsy and accessioning of specimens into the Australian Registry of Wildlife Heath.

Site description

The shark nets at all five beaches of Hawksbill Turtle capture are bottom-set in between 10-12m water depth and approximately 500m offshore. Each net is 150m long by 6m deep. They are set parallel to and relatively close to the shore. As most nets are set away from reef structure to minimise their damage and to enhance ease of operations for the contractors, they are considered less likely to capture reef-associated species such as Hawksbill Turtles.

Incident review

Although Hawksbill Turtles are considered to occupy shallow waters (less than 30m), they are infrequently caught in the either the Queensland Shark Control Program or NSW Shark Meshing Program.

Hawksbill Turtles are listed as Critically Endangered (A2bd) for their global status under the IUCN Red List of Threatened Species (Mortimer and Donnelly, 2008) but are listed as Vulnerable in Australian waters under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. Hawksbill Turtles have had a recovery plan in force since 2007 (Department of Environment, 2017).

Although Hawksbill Turtles are known to occur in NSW waters, none of their key nesting and inter-nesting areas (where females live between laying successive clutches in the same season) are in NSW (Department of Environment, 2017).

A review of their strandings along NSW beaches highlighted a skewed stranding frequency to northern NSW beaches (Fig. 1) (Ferris, 2016). The region of the NSW Shark Meshing Program is considered outside of their preferred range; however, it is possible that a range extension southward could be expected with warming waters following climate change.

The size range of 35-94cm curved carapace length (CCL) corresponds to the size at recruitment on to reef habitat from the pelagic environment (Limpus, 1992; Limpus *et al*., 2008). The months of capture in the SMP reflect increased periods of strandings in NSW waters (Ferris, 2016) and may reflect changes in the strength and seasonal variation of the East Australian Current (EAC). This influence of the EAC may also have contributed to the overall increase in marine wildlife captures in the SMP during the period being reported on.

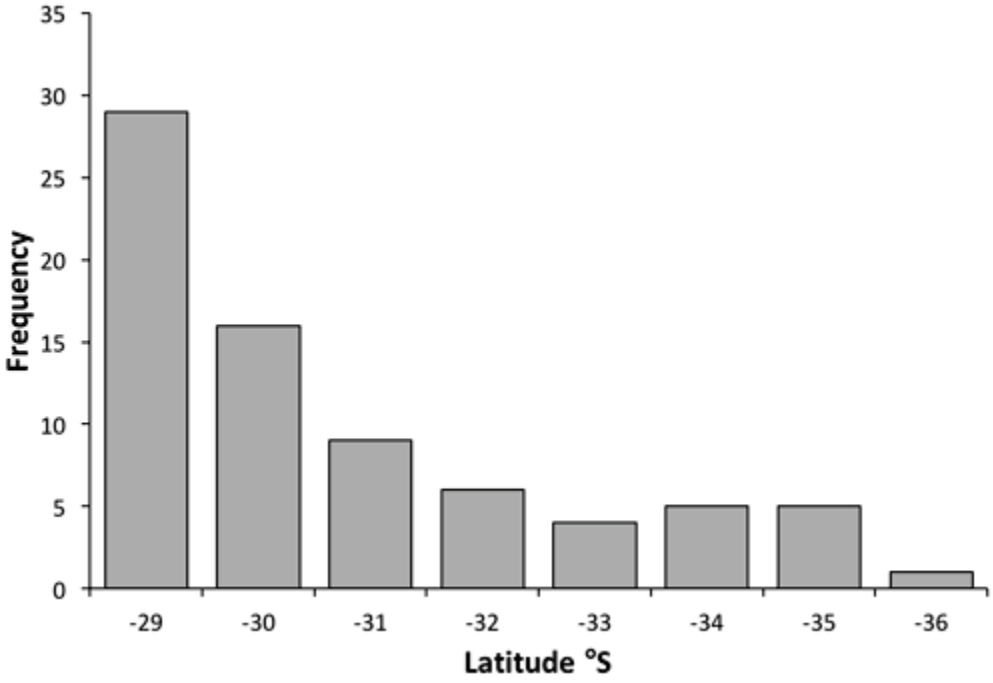

Figure 1: Latitudinal spread of Hawksbill Turtle stranding events in New South Wales (n=173) between 1996 and 2011 (Ferris, 2016).

Conclusions

Although the trigger point was tripped following the capture of five Hawksbill Turtles, this is likely due to the long period of zero reported catch for this species during the preceding decade.

The SMP has maintained an active policy of ensuring nets are set sub-surface in an attempt to enable air-breathing marine mammals, reptiles and birds to swim over the top of the net. There are currently no known effective turtle exclusion devices for incorporation into gillnets.

Recommendations

The NSW SMP nets have caught few Hawksbill Turtles over the past decade, however, it is anticipated that these catch trends may increase with increasing temperature of nearshore waters and subsequent movement of warm-water species into central NSW waters.

Although it is unlikely that the current rate of SMP-induced fatality of Hawksbill Turtles will negatively affect the population, it is imperative that ongoing efforts to reduce any bycatch be continually re-assessed. Positioning of the nets well away from reef may reduce entanglement of reef-associated species such as Hawksbill Turtles. Additionally, ensuring nets are not stretched tight when they are laid could assist turtles to reach the surface post-entanglement and thereby potentially reduce turtle mortality.

References

Department of the Environment (2017). *Eretmochelys imbricata* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed Fri, 7 Jul 2017 11:09:14 +1000.

Ferris, R. 2016. Hawksbill turtle (*Eretmochelys imbricata*) stranding events in New South Wales, Australia, between 1996 and 2011. Marine Turtle newsletter 148: 8-12.

Limpus, C. 1992. The hawksbill turtle, *Eremochelys imbicata,* in Queensland: Population structure within a Southern Great Barrier Reef feeding ground. Wildlife Research, 19: 489-506.

Limpus, C.J., Miller, J.D., Guinea, M., Whiting, S. 2008. Australian hawksbill turtle population dynamics project. Environmental Protection Agency Queensland. 130pp.

Mortimer, J.A and Donnelly, M. (IUCN SSC Marine Turtle Specialist Group). 2008. *Eretmochelys imbricata*. The IUCN Red List of Threatened Species 2008: e.T8005A12881238. http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T8005A12881238.en. Downloaded on **09 July 2017**.

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