

Environment and Communications References Committee

Threat of marine plastic pollution in Australia

10 March

Dr Kathy Townsend

I was also asked a question from the senate panel regarding the research funds that I was able to access to support my research. I was unclear if the question was regarding “targeted funding for marine debris research” or research funding in general.

So for clarity, there was no targeted funding for marine debris research that I was able to access. My research was funded through industry partnerships (Earthwatch, Healthy Waterways, Samford Valley Vet and Underwater World Mooloolaba) and an ARC Linkage grant (LP110200216). The combinations of all of these contributors equated to \$465k over three years. From this we were able to leverage an additional \$2.5m towards research in marine debris and its impacts. All of this additional income came from philanthropic donations. Please find attached a summary of the ARC Linkage grant outcomes.

Turtles in Trouble

Summary of Project



Scientific Findings



33% of sea turtles in Moreton Bay have ingested marine debris



50% of the world's sea turtles have ingested marine debris



The likelihood a Green sea turtle will ingest debris has nearly doubled since 1985



Turtles target clear and soft plastics, because they look like natural food



Young oceanic turtles are at greater risk of debris ingestion than older benthic sea turtles



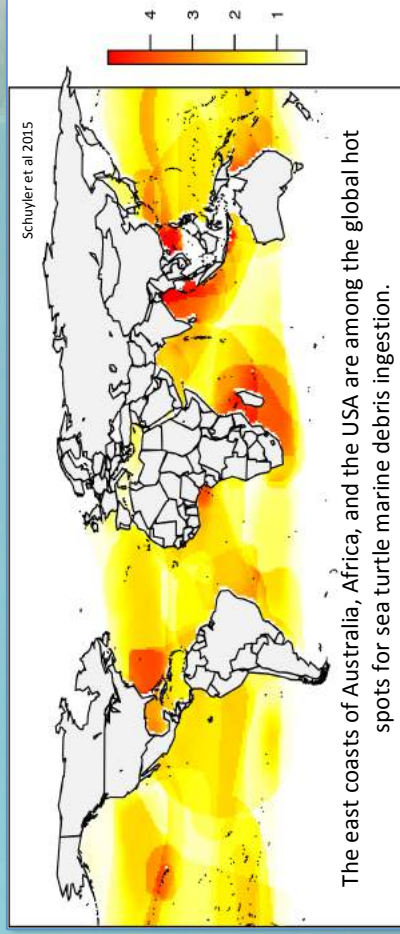
Fishing debris is the most lethal form of debris ingested by turtles

Background

"Turtles in Trouble" is scientific study that brought together a multidisciplinary team to tackle the global question about the impact of marine debris on sea turtles. Funded by a \$465K ARC Linkage Grant (LP110200216), it is a collaborative effort between researchers, industry partners, NGO, government agencies, and the general public. In recent years, entanglement and ingestion of marine debris has become one of the most common sources of mortality observed in marine turtles nationally. Australia is a globally important location for threatened sea turtles - providing a haven for six of the world's seven species.

The aim of this project was to determine the impact of marine debris on Australia's endangered sea turtles by describing its distribution, quantifying its impacts and suggesting targeted management strategies to deal with the issue.

Global risk analysis for sea turtles ingesting marine debris



Outreach

- Featured in national and international TV
- Featured in both national and international print media
- Over 50 presentations at schools and community events
- Over 1000 followers on social media

Policy Input

- Federal level: National Species Threat Abatement Plan
- State level: Plastic bag mitigation strategy (QLD and NSW)
- Local level: Redland City Council Waste Strategy

Major Awards

- **Finalist** for the "Minister's Award for Leadership in Sustainability" 2015
- **Winner** of "Healthy Waterway Research Award" 2015
- **Winner** "Best student paper" at the International Sea Turtle Symposium 2011
- **Finalist** for "Australia Day Award for services to the Environment" 2010

FAST FACTS

4 Original Partner Organisations

22 Additional Partner Organisations

8 Peer reviewed publications

102 Citations of our work

12 Young scientists mentored

>700 Citizen Scientists Trained

100's Global media stories

\$2.5m Additional funds leveraged



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

“Identifying the risks and assessing the impacts of marine debris on sea turtles in Australian waters”

ARC Linkage LP110200216.

Lead Scientists: Dr. Kathy Townsend, Prof Justin Marshall, Dr Chris Wilcox and Dr Denise Hardesty



Publications

- Schuyler, Q.A., Wilcox, C., Townsend, K.A., Wedemeyer-Strombel, K.R., Balazs, G., van Sebillle, E., Hardesty, B.D. (2016) “Risk analysis reveals global hotspots for marine debris ingestion by sea turtles” *Conservation Biology: Global Change Biology*, 22(2): 567-576
- Vegter, Amanda C., et al (2014) “Global research priorities to mitigate plastic pollution impacts on marine wildlife” *Endangered Species Research* 25: 225-247
- Schuyler, Q.A., Wilcox, C., Townsend, K.A., Hardesty, D.B., and Marshall, J.N. (2014). “Mistaken identity? Visual similarities of marine debris to natural prey items of sea turtles.” *BMC Ecology*, 14:14
- Acampora, H., Schuyler, Q.A., Townsend, K.A. and Hardesty, B.D. (2014) “Comparing plastic ingestion in juvenile and adult stranded Short-tailed Shearwaters (*Puffinus tenuirostris*) in eastern Australia.” *Marine Pollution Bulletin* 78: 63-68
- Schuyler, Q., Hardesty, B.D., Wilcox, C., Townsend, K.A. (2013) “Global Analysis of Anthropogenic Debris Ingestion by Sea Turtles” *Conservation Biology*. doi: 10.1111/cobi.12126
- Schuyler, Q., Hardesty, B.D., Wilcox, C. and Townsend, K.A. (2012) “To eat or not to eat? Debris selectivity by marine turtles” *PLOS ONE* 7(7)
- Müller, C., Townsend, K.A., Matschullat, J. (2012) Experimental degradation of polymer shopping bags (standard and degradable plastic, and biodegradable) in the gastrointestinal fluids of sea turtles. *Science of the Total Environment* 416: 464-467
- Townsend, K.A., Altwater, J., Thomas, M.C., Schuyler, Q.A. and Nette, G.W. (2012) Death in the Octopus’ Garden: Fatal Blue-lined Octopus Envenomations of Adult Green Sea Turtles. *Marine Biology* 159: 689-695
- Townsend, K.A. (2011) Sea turtle deaths in Moreton Bay. In: *Wild Guide to Moreton Bay and Adjacent Coasts*, Volume 1, 3rd edition, Ed: Peter Davie, Queensland Museum. 148-149

Student projects

- Dr’s Melody Puckridge and Qamar Schuyler – Post Doc students, School of Biological Science, The University of Queensland, “Impact of marine debris on sea turtles”, Nov 2014 to March 2016
- Ms Qamar Schuyler – PhD student, School of Biological Science, The University of Queensland, “Impact of marine debris on sea turtles”, Aug 2010 to 2014 (Full scholarship plus CSIRO top up scholarship)
- Ms Lauren Roman - Honours student, School of Biological Science, The University of Queensland, “Plastic ingestion in eastern Australian marine birds” Feb 2013 to Nov 2013
- Ms Hayley Jones – Honours student (part time), School of Biological Science, The University of Queensland, “Using forensic techniques to determine the temporal scale of entanglement impacts on sea turtles.” June 2012 to present (Supported by ARC Linkage and CSIRO grants)
- Ms Christine Yong – Honours student, School of Biological Science, The University of Queensland, “Do flood events influence metal concentrations in green sea turtles in Moreton Bay?” Feb 2012 to Sept 2012 (Full AMCS scholarship plus a Goodman Foundation grant)
- Ms Heidi Acampora – Masters student, Department of Biology, Marine Biology Section, Ghent University, “Assessing the Impacts of Plastic Ingestion by Short-Tailed Shearwater (*Puffinus tenuirostris*) Seabirds in Coastal Australia” March 2012 to June 2012 (Full OS scholarship)
- Ms. Diede Melsen – Six month internship, University of applied sciences HAS Den Bosch, “Experimental degradation of common marine debris including rubber balloons, in semi-tropical, coastal environments.” Feb 2012 to June 2012 (Full OS scholarship)
- Ms. Emmie Willis – Undergraduate project, School of Biological Science, The University of Queensland, “A classification of the synthetic polymer types ingested by green turtles (*Chelonia mydas*) and hawksbills (*Eretmochelys imbricata*) in Moreton Bay, Australia. June 2012 to Aug 2012 (Supported by ARC Linkage)
- Ms. Emmie Willis – Three month research project, School of Biological Science, The University of Queensland, “A classification synthetic polymers ingested by Shearwaters and Ocean Turtles” March 2012 to June 2012 (Supported by ARC Linkage grant)
- Ms Ellie Younis – Internship, Southern Cross University, “Classification of marine debris consumed by sea turtles”, Dec 2010 to Feb 2011 (Scholarship)
- Mr Sam Jones – Internship, Duke of Edinburgh Award, “Classification of marine debris consumed by sea turtles”, Dec 2012 to Jan 2011
- Mr Roland Fritsch – Internship, University of Queensland, “Forensic analysis of shell epiphytes as an indicator of sea turtle health”, July 2010
- Ms. Casey Conroy – Summer student, School of Veterinary Science, The University of Queensland, “The lethal and sub-lethal impacts of ingested marine rubbish on the gastrointestinal tract of sea turtles” Dec 2008 to Feb 2009
- Ms. Hayley Jones – Summer student, Centre for Marine Studies, The University of Queensland, “Do sea turtles target plastic bags? A comparison of beach washed vs. ingested debris from stranded turtles from SE Queensland” Dec 2008 to Feb 2009



EARTHWATCH®
INSTITUTE



Healthy Waterways
ONE CLEAR VISION

