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Review and suggestions for upgrading StrandNet as a key element of the Reef 2050 Integrated Monitoring and Reporting Program:

Final Report of the StrandNet Team in
the Megafauna Expert Group



Helene Marsh¹, Colin Limpus², Justin Meager², Alicia Moisei³, Mark Read⁴, Sarah Salmon⁴, Susan Sobotzick⁵

¹Division of Tropical Environments and Societies, James Cook University

²Aquatic Species Program, Queensland Department of Environment and Science

³Queensland Department of Environment and Science

⁴Great Barrier Reef Marine Park Authority

⁵Centre for Tropical Water and Aquatic Ecosystem Research TropWATER, James Cook University

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Australian Government
**Great Barrier Reef
Marine Park Authority**

Great Barrier Reef Marine Park Authority
280 Flinders Street Townsville | PO Box 1379 Townsville QLD 4810
Phone: (07) 4750 0700
Fax: 07 4772 6093
Email: info@gbmpa.gov.au
www.gbmpa.gov.au

Contents

Contents	3
1.0 Executive Summary	1
2.0 Introduction	2
3.0 Methods	2
4.0 Overview of the present program and its strengths	3
5.0 Concerns about the operation of StrandNet and suggestions for improvement	4
5.1 Coverage	4
5.2 Response capacity	8
5.3 Prioritisation of response	8
5.4 Technical matters	8
5.5 Training	9
5.6 Data storage and access	9
5.7 Communication	9
5.8 Operational guidelines	10
6.0 RIMReP Indicators from StrandNet Data	10
7.0 Recommendations	11
7.1 Estimated costs of recommendations	12
8.0 Acknowledgments	13
9.0 References	13
10.0 Appendix 1	15
11.0 Appendix 2	18

1.0 Executive Summary

- The objective of this report is to provide an overview of the present StrandNet program and suggest how it might be improved to enable the StrandNet database to function as a central component of the megafauna component of the Reef 2050 Integrated Monitoring and Reporting Program (RIMReP).
- The report results from a cross-sectoral, expert workshop held in Brisbane on June 11 2018 and attended by personnel from the Great Barrier Reef Marine Park Authority (the Authority), Queensland government departments of Environment and Science and Agriculture and Fisheries, James Cook University (JCU) and the University of Queensland (UQ), plus subsequent input from some of the workshop attendees.
- StrandNet, a database of marine wildlife strandings and mortalities, is a nationally respected source of long-term scientific information and data about marine mammals and turtles that has been maintained by the Queensland Government since 1996.
- StrandNet is an important component of the monitoring of marine wildlife, especially marine mammals and turtles, on the Queensland Coast, particularly the east coast between Port Douglas and the Queensland- New South Wales border.
- The primary focus of the StrandNet database is to record information on where sick, injured, dying and dead marine cetaceans (whales and dolphins), pinnipeds (seal and sea lions), dugongs and marine turtles have been found in Queensland and assess causes of injury and death.
- Analysis of the StrandNet data has resulted in important insights, especially with regards to: (1) the environmental drivers underpinning stranding events; (2) long-term trends in strandings and bycatch in the Queensland Shark Control Program; and (3) disease in marine wildlife.
- The program relies on collaborations with local councils, community volunteers, non-government organisations such as the RSPCA, rehabilitation facilities such as Sea World and Australia Zoo, Indigenous rangers and veterinarians and scientists based in government laboratories, universities and private facilities.
- The program has informed conservation management of sources of anthropogenic mortality, especially vessel strikes and incidental catches in commercial fisheries.
- We recommend that high priority be given to:
 - appointing a state-wide StrandNet Co-ordinator with responsibilities for data quality assurance, database maintenance, collation of samples from stranded animals, analysis, reporting and engagement
 - improving or replacing the StrandNet API (Application Programming Interface)
 - developing an app to enable the public to better record, photograph and report marine wildlife strandings and mortalities
 - holding an inter-agency workshop with relevant technical experts to determine agreed priorities and triggers for: (1) necropsy and (2) the collection, storage and processing of data and specimen materials.
 - developing Memoranda of Understanding with key partners, and
 - conducting regular training workshops with key first responders

2.0 Introduction

StrandNet, a database of marine wildlife strandings and mortalities, has been maintained by the Queensland Government since 1996. The database evolved from a program of research documenting strandings in Hervey Bay in the 1980s and monitoring the effectiveness of the 1990 Woongarra Marine Park zonings for reducing trawling related deaths of turtles. StrandNet is an important component of the monitoring of marine wildlife on the Queensland Coast, particularly the east coast between Port Douglas and the Queensland- New South Wales border. The primary focus of the StrandNet database is to record information on where sick, injured, dying and dead marine cetaceans (whales and dolphins), pinnipeds (seal and sea lions), dugongs and marine turtles have been found in Queensland, and assess causes of injury and death. Incidental information on sharks, rays, seabirds and other marine animals is also recorded, if possible. Incidents that are recorded include animals that are stranded ashore or encountered at sea (e.g. entanglement, vessel strikes or incidental catch in fisheries).

Data collected and collated in the strandings database are summarised in annual reports produced by staff of the Queensland government <https://www.ehp.qld.gov.au/wildlife/caring-for-wildlife/strandnet-reports.html>. Reports of individual strandings are variously supplied by: staff from the Department of Environment and Science (DES) and the Great Barrier Reef Marine Park Authority (the Authority), rescue organisations (Sea World, Australia Zoo Wildlife Hospital, Sealife Sunshine Coast, Quoin Island Turtle Rehabilitation Centre, Gladstone Area Water Board, ReefHQ and Cairns Turtle Hospital) as well as Indigenous Ranger groups, community groups, volunteers, and the general public. Many of these reports come in via a Hotline maintained by the Royal Society for the Prevention of Cruelty to animals (RSPCA). The database also contains records from the Queensland Department of Agriculture and Fisheries' (DAF) Shark Control program <https://www.daf.qld.gov.au/business-priorities/fisheries/shark-control-program/catch-numbers> and records of all cetacean specimens from Queensland held by Australian Museums.

When possible, the reports of individual strandings are evaluated by experts to determine when marine animal deaths occur directly as a result of human causes, for example through vessel strikes. Thus StrandNet plays a role in raising community awareness about how these type of incidents caused by humans can be prevented. Since its establishment, StrandNet has informed management of the Great Barrier Reef World Heritage Area (e.g. Dugong Protection Areas established in 1997 <https://data.qld.gov.au/dataset/dugong-protection-areas>) and is thus highly relevant to the megafauna component of the Reef 2050 Integrated Monitoring Program (RIMReP).

The objective of this report is to provide an overview of the present program and suggest how it might be improved as a component of the RIMReP megafauna monitoring program.

3.0 Methods

This report results from a workshop held in Brisbane on June 11 2018. In addition to the authors of this report, the workshop was attended by:

- Dr Fergus Molloy (the Authority)
- Ms Amanda Dawson, Dr Ian Jacobson, and Mr Jeffrey Krause (Queensland Department of Agriculture and Fisheries (DAF)), and
- Dr Helen Owen (University of Queensland, University of Queensland).

The workshop commenced with an overview of the current program presented by Limpus and Meager and then considered: (1) the strengths of the present program; (2) concerns about the present program and ways to improve it. Because of the way in which StrandNet is administered and because many of the species regularly migrate in and out of the Great Barrier Reef World Heritage Area (the World Heritage Area), the Great Barrier Reef (the Reef) component cannot be separated from the main program, a situation reflected in this report.

4.0 Overview of the present program and its strengths

StrandNet provides a record of the spatial and temporal patterns of reported marine wildlife strandings and mortalities on the Queensland coast since 1996 and for more localised areas from the early 1980s. Records come from most of the Queensland coast including some from the remote regions of Cape York and the Gulf of Carpentaria. The program largely relies on public reporting and thus is biased to populated areas on the east coast, mainly from Port Douglas south, with limited records from other areas (see Figure 1 below). The program includes records of marine megafauna from the Queensland Shark Control Program but has few data from some important other sources of megafauna mortality, especially from commercial fisheries logbooks (Species of Special Conservation Interest (SOCI) logbooks) and Indigenous harvest.

The database includes some of the only records in Queensland of elusive species such as several species of beaked whales and the dwarf sperm whale (*Kogia sima*). In addition, a new species of dolphin was described based on specimens collected in the Queensland Shark Control Program in 1972 (Australian snubfin dolphin, Beasley et al. 2005, personal communication 2018). Another stranding near Townsville provided the holotype for the Australian Humpback dolphin (Jefferson and Rosenbaum 2014)

A strength of the internet-based database is that it is owned and administered by the Queensland Government. This arrangement has enabled StrandNet's longevity and ensured a strong focus on quality control. StrandNet is thus a nationally-respected source of long-term, scientific information and data.

StrandNet is the main source of knowledge about human-related mortality factors affecting marine mammals and turtles in Queensland. Some necropsies are performed, although conducting necropsies has not been a priority and is rarely undertaken for large whales. It has not been possible to determine the cause of death for many stranded animals (e.g. the cause of death (including unknown anthropogenic) could only be determined for 38 per cent of 88 dugongs for the period 2013-15; Meager 2016a). Nonetheless, StrandNet's record in determining cause of death compares favorably with better funded stranding programs from much less logistically- challenging regions. For example, the cause of death could not be determined for ~ 30 per cent of recovered Florida manatee carcasses, despite an elaborate necropsy program in a much smaller area of much higher human density than Queensland and in a sub-tropical (rather than a tropical) climate <http://myfwc.com/media/4132463/YearToDate.pdf>.

The analysis of the StrandNet data has resulted in important insights, especially with regard to: (1) the environmental drivers underpinning stranding events (e.g. Meager and Limpus 2014; see Figure 2; Flint et al. 2017); (2) long-term trends in strandings and bycatch for data-limited marine mammals (e.g. Marsh et al. 2005 for dugongs; Meager and Sumpton 2016 for cetaceans); and (3) health and diseases in marine wildlife (e.g. incidence of fibro-papilloma in marine turtles, Flint et al. 2010; morbillivirus in dolphins, Stone et al. 2012; bacteria in dugongs, Nielsen et al. 2013).

In collaboration with facilities such as Sea World and Australia Zoo, the program also provides for the rescue and rehabilitation of live animals. For example, of the 515 cetaceans and pinnipeds for which StrandNet records are available for 2006-2015, 194 (~38 per cent) were released alive or escaped (Meager 2016b).

Public involvement is a strength of the program, which relies on collaboration networks with local councils, community volunteers, non-government organisations such as the RSPCA, rehabilitation facilities such as Sea World and Australia Zoo, Indigenous rangers and professionals such as veterinarians and scientists based in government laboratories, universities and private facilities. These collaborations have been enhanced by training programs associated with StrandNet. However, training effort has diminished in recent years.

The program has informed conservation management of sources of anthropogenic mortality, especially vessel strikes e.g. go-slow areas designed to protect dugongs and turtles in the Moreton Bay and Great Sandy Marine Parks and the response to acute threats such as the temporary closure of the Boyne River estuary in 2011 to commercial net fishing for 60 days, in response to the deaths of 22 green turtles over the period of a month (<https://www.gladstoneobserver.com.au/news/trawler-ban-river-mouth-just-the-start-gladstone/838660/>; Meager and Limpus 2012).

5.0 Concerns about the operation of StrandNet and suggestions for improvement

5.1 Coverage

Apart from the records from the Queensland Shark Control Program (QSCP), which operates on popular beaches from Cairns to the Gold Coast, StrandNet largely relies on DES staff monitoring beaches within the Queensland National Parks, monitoring within Marine Parks and on reports from the public. However, low level aerial surveys of turtle nesting and stranded wildlife on beaches of the Gulf of Carpentaria, Cape York to Princess Charlotte Bay and islands and coast line from Repulse Bay to Broad Bay detected only isolated strandings of individual animals (Limpus and Miller, 2008; Limpus et al. 2002). In addition, since 2000, many hundreds of kilometres of “remote” beaches along western Cape York Peninsular have been patrolled annually by DES staff and Indigenous rangers and except for turtles washed ashore in ghost nets, stranded marine wildlife have been rarely encountered, especially marine mammal strandings. Thus the incidence of marine wildlife strandings in these areas of limited coverage is considered low.

There is an extreme bias with respect to detecting marine wildlife mortality that occurs well offshore of the coast, as is evidenced by the paucity of records from the vast numbers of marine turtles drowned in prawn trawl fisheries in the Gulf of Carpentaria, Torres Strait and eastern Queensland prior to the regulated compulsory use of Turtle Exclusion Devices in trawl fisheries commencing in 2001. Except for very large animals, most floating carcasses are expected to have been scavenged by sharks before they wash ashore.

Thus StrandNet records are spatially biased, reflecting human use of the coast and taxa that occur in concentrated populations close to shore and in proximity to outflows from large catchments (Figure 1). This bias is obvious from the records, which are dominated by records from Hervey Bay and Moreton Bay, especially for Cheloniidae (marine turtles). The majority of cetacean (dolphins and whales) records are also from South-East Queensland. The baleen whales are largely humpback whales, which migrate closer to the coast in South-East Queensland than further north. The species that dominates the QSCP bycatch, the short-beaked common dolphin, does not occur north of Fraser Island. Pelagic and continental-shelf cetaceans such as melon-headed and short-finned pilot whales are more likely to strand in southern Queensland than of the Reef coast, because of the former’s comparatively narrow shelf and ocean-exposed coastline.

Australian humpback dolphins are a suitable cetacean proxy for reporting effort because they occur along much of the mainland coast of Queensland. While the distribution of humpback dolphin strandings in comparison with the Remoteness Index of Australia (ARIA+, downloaded from <http://ausstats.abs.gov.au>) suggests that there was sparse reporting effort in very remote areas (north of Port Douglas and throughout the Gulf of Carpentaria; Figures 1-3, reporting effort will also be dependent on the patchy distribution of the dolphin populations and non-uniform exposure to threatening processes. Remote areas along the east coast also had comparatively fewer records than regional or urban areas. The stranding reports for dugongs were more evenly distributed reflecting their wider distribution than that of coastal dolphins.

In the central Reef region, there have been few records of all taxa from the remote Broad Sound region (see Figure 3 for marine turtles). There have also been few StrandNet records from Cape York, north of Cooktown (Figure 1).

Most of the records are for Cheloniidae (82 per cent), followed by Dugongidae (12 per cent), Delphinidae (4 per cent) and Balaenopteridae (2 per cent), reflecting in part, the abundance of species that are year round residents in marine habitats close to shore.

Given the logistical constraints inherent in the StrandNet program, it is unrealistic for the spatial coverage of the Reef to be more comprehensive in the foreseeable future. However, the long-term pattern is likely valid, if we make the reasonable assumption that the spatial bias is relatively constant over time. The fact that most StrandNet records were from southern Queensland emphasises the value of a state-wide strandings program as an indicator of ecological processes operating on the Reef. This need for the bigger picture is obvious for migratory species such as humpback and Dwarf Minke whales, and marine turtles, but also for species such as dugongs and coastal dolphins.

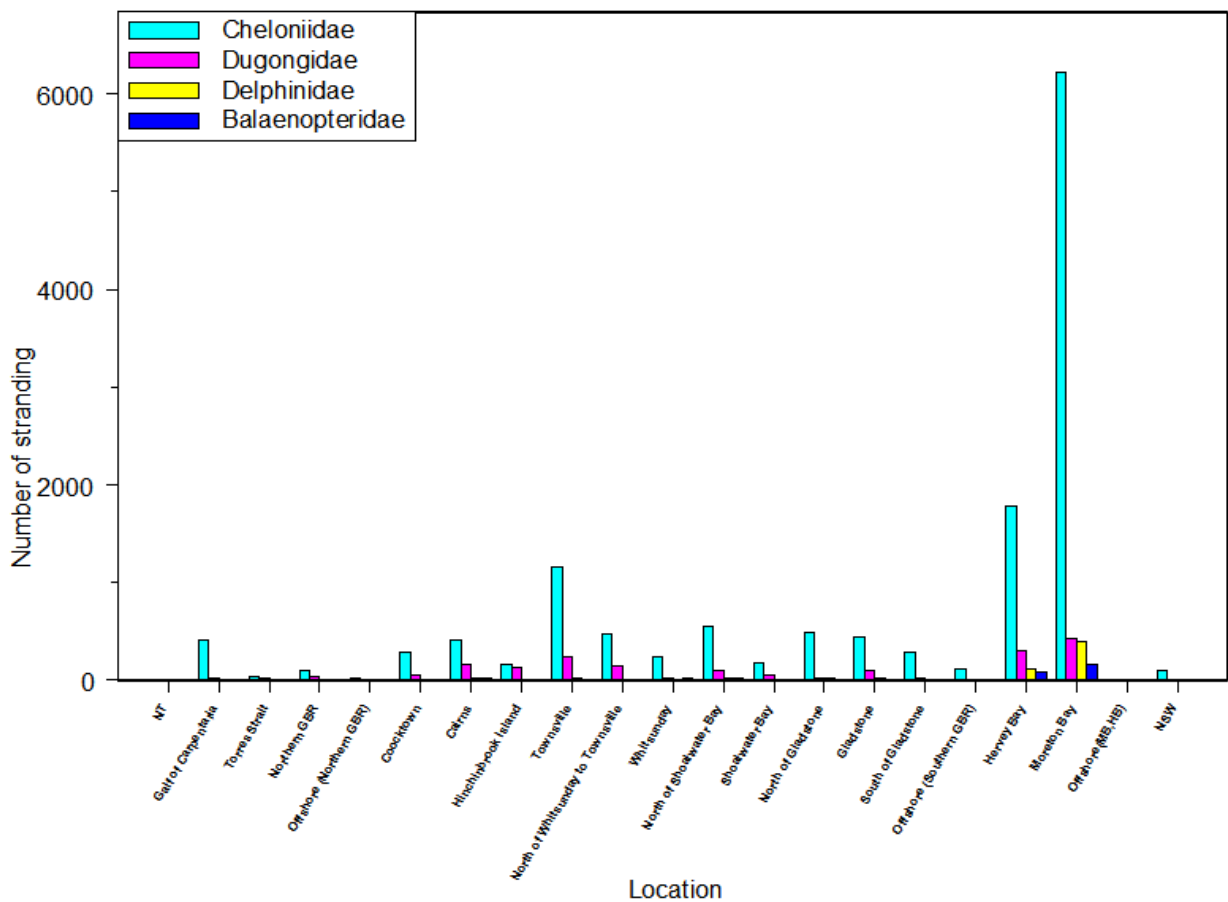


Figure 1. Number of StrandNet records for the various localities by major taxonomic group 2000-2014.

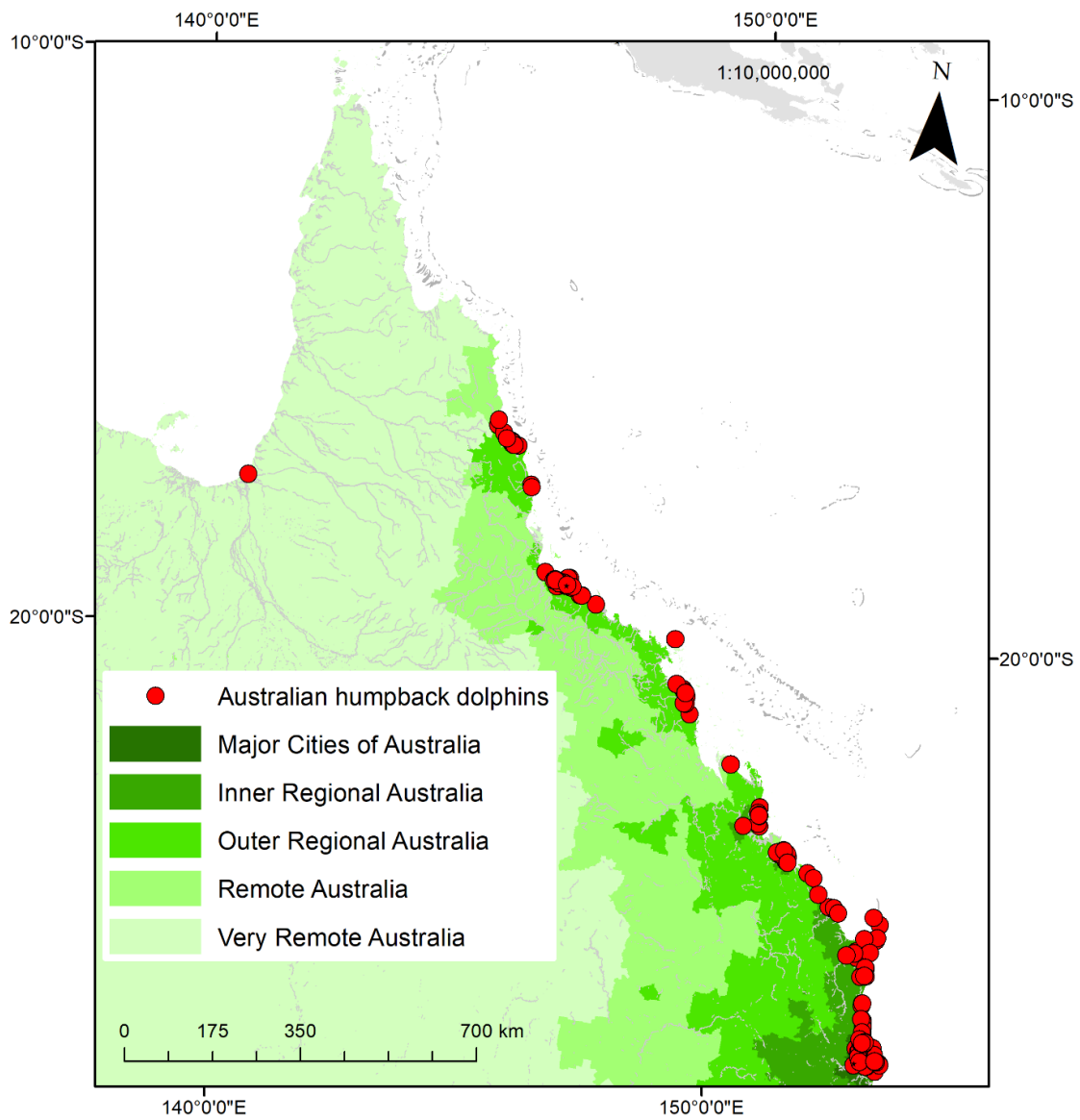


Figure 2. Spatial distribution of a strandings of Australian humpback dolphins (January 1996-June 2018), a species that occurs along much of the coastline. Also shown is the Remoteness Index from the Australian Bureau of Statistics, which is based on distance by road to population centres.

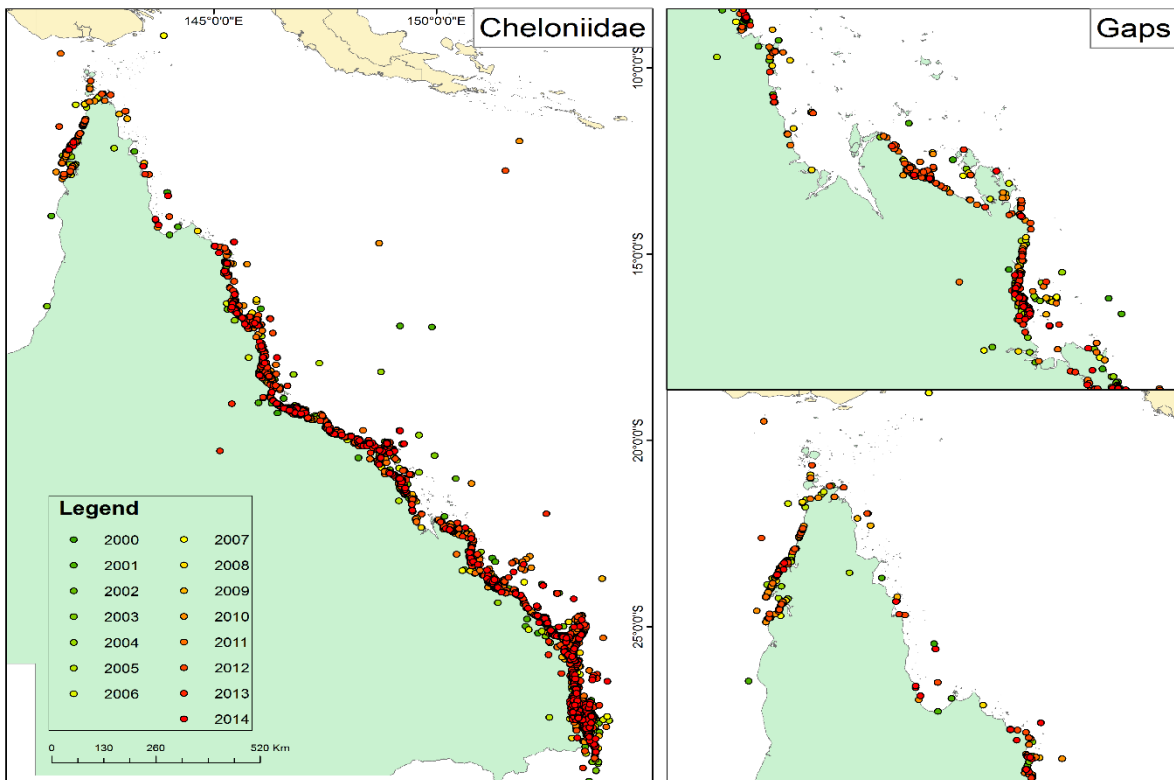


Figure 3. Spatial distribution of Cheloniidae (marine turtle) strandings between 2000 and 2014. Note the low number of reports from Broad Sound on the Central Queensland Coast 9 (top right) and Cape York (lower right).

5.2 Response capacity

The workshop noted that there is an increasingly limited capacity for QPWS (Queensland National Parks and Wildlife) field staff to respond to strandings. Over the past eight years, DES has established an extensive network of volunteers that assist with response to reports of stranded marine turtles in the Great Barrier Reef Marine Park (the Marine Park). Strandings training was delivered in key locations and identified 'gap' locations across the Reef, increasing community capacity to respond and report on marine turtle strandings, and improve data capture from more isolated locations. Given the intensity of resources required for face-to-face training, an online training program (available through the Authority's ILIAS E-learning platform) was also developed and is now offered to volunteers as an alternative training tool. Whilst the online training provides a good general overview of marine turtle stranding response and data collection and reporting, it does not have the benefits of building practical skills, ensuring a high level of comprehension and understanding, and strengthening partnerships that the face-to-face training offers. Therefore, there is a need to build on the existing volunteer framework and increase the capacity of Indigenous rangers and the wider community to act as first responders through face-to-face training as outlined below.

People who are most likely to be first responders such as Indigenous rangers and community groups need face-to-face training as outlined below. Increasing the capacity of Indigenous rangers to report and respond to strandings would also improve the coverage of the strandings programs in very remote areas. Developing a modern first response capacity (using smartphones, photos, GPS, APPs, etc.) would assist such groups and the wider community to be more effective as first responders. The ability for the public to submit photos from their smartphones to StrandNet may also help to improve reporting of at sea incidents, such as entanglement and vessel strikes.

5.3 Prioritisation of response

The workshop identified discrepancies between the ways in which responses and follow-up actions including necropsy and specimen collection were prioritised within the boundaries of the Marine Park and state Marine Parks compared with the rest of Queensland. Prioritisation seemed to be most explicit and supported in the Marine Park region where it is determined by Standard Operating Procedures. QPWS staff also routinely collect specimens in the Moreton Bay Marine Park and along the east coast of Fraser Island. The priority is clear for live animal strandings, mass (multiple) strandings, dead animal strandings if illegal activity is suspected or strandings associated with incidents such as an oil spill. The response triggers are less clear for unusual mortality events (UME) events that are more diffuse over space or time. Examples of such events include a cluster of dead animals with unusual pathology over a period of several months (e.g. Upstart Bay green turtles, Villa et al. 2017) or across a large region (e.g. at least 21 Risso's dolphin strandings were reported from from Tasmania to Queensland in 2014-15, <https://taronga.org.au/taronga-science/wildlife-health/rissos-dolphin-mortalities>). Priorities for response need to be resolved by an expert workshop if StrandNet is to perform as a key component of RIMReP for megafauna. The expert workshop should also develop decision trees to facilitate: (1) cause of death determinations to inform the management response, and (2) when to euthanase a stranded animal.

5.4 Technical matters

The capacity of Queensland Government to provide technical assistance with obtaining and processing of specimen materials from stranded animals has reduced in recent years. There are also fewer options for archiving material with changes of staff at the Queensland Health/University of Queensland ENTOX facility, the retirement of the mammologist at the Queensland Museum and fewer resources at the Australian Marine Mammal Centre of the Australian Antarctic Division in Tasmania. Thus interested university experts (biologists, ecotoxicologists, veterinarians), government veterinarians and private experts (especially veterinarians) need to be identified through a skills audit and trained in forensic response, preferably aided by a pool of national and international veterinarians with the capacity to provide

expert advice to first responders e.g. (1) Sea World veterinarian; (2) Dr. Mark Flint). There is a particular need to identify and train willing veterinarians in regional areas. Formal arrangements need to be developed with appropriate technical experts and their institutions concerning the collection and processing of samples and the long-term storage of samples, especially samples for studies of life history, toxicology and genetics.

5.5 Training

To be effective, StrandNet needs access to skilled staff and volunteer personnel. Face-to-face training used to be a feature of the StrandNet program. However, the capacity of the program to facilitate the training of field staff, Indigenous rangers and other key first responders and veterinarians has diminished in recent years due to funding limitations and departmental restructuring. There has been little formal training of Marine Parks staff since 2005. The resultant skills deficit has been exacerbated by high staff turn-over. Training needs assessments of ranger staff, Indigenous rangers, NGOs, community volunteers, veterinarians, and local council staff are urgently needed as a basis for developing an overall training plan. Strandings training includes diverse skills such as incident control; animal rescue; disentanglement; species identification; reporting strandings; post mortem sampling and measurements; necropsies and using the StrandNet database itself.

5.6 Data storage and access

Briefly, the StrandNet database is a relational Oracle database stored on a Queensland Government server that is accessible to users by logging in through a web API (Application Programming Interface) written in Java. There are three classes of users with different tiers of access: (1) external community groups, (2) government users and (3) SuperUsers. Once a record has been submitted by a government or community group user, the record is then verified by a SuperUser, who also enters the cause of death and additional information such as necropsy reports. The SuperUsers include staff from each of the Marine Parks (Moreton Bay, Great Sandy Strait and the Reef), the Aquatic Species Unit and Coastal and Island Parks (Fraser Island). Up until 2012, this process was overseen by a state-wide stranding coordinator (Appendix 1), a role that has since been shared amongst staff. In a recent internal review of the system, several suggestions were made for enhancements and fixes to StrandNet to make it easier to use and the data more accessible (e.g. with an open access portal) (Appendix 2). Given the highly customised nature of the API, changes such as introducing new fields or modifying the spatial layer require considerable programming and would be best addressed with a new system (Appendix 2).

During the expert workshop, external experts also recommended that an improved database include fields to enable: (1) the StrandNet, Shark Control and SOCI (Species of Conservation Interest) databases to be linked directly (so DAF do not have to submit reports to DES that are then manually entered); (2) additional data to be incorporated into StrandNet in a form that is more amenable to analysis (e.g. life history, toxicological and genetic data from stranded animals); (3) improvements to the mapping component of the system to facilitate easier analysis, such as a buffer that includes intertidal areas adjacent to Marine Parks. These improvements will be particularly important when mandatory observing systems are introduced on commercial fishing vessels, greatly improving the capacity to record the bycatch of megafauna.

5.7 Communication

Despite StrandNet results being used to inform the conservation management of marine wildlife in Queensland (and the Reef specifically), the potential policy value of StrandNet is underappreciated by most stakeholders including policy makers and field staff. There is a significant lag in producing annual reports and the latest annual reports are dated 2016 (cetaceans, dugongs, pinnipeds) and 2011 (marine turtles) (<https://www.ehp.qld.gov.au/wildlife/caring-for-wildlife/strandnet-reports.html>). This situation means that the program is underfunded, and the field staff response and subsequent reporting into StrandNet is given low priority. More streamlined modern database visualisation tools, outlined in

Appendix 2 could facilitate reporting and web updates. However, oversight will still be required by the Stranding Coordinator for data quality assurance, and to ensure appropriate treatment of information related to compliance investigations or investigations protected under the Privacy Act 2009 (Qld). In addition, there are several areas where communication with the wider community could be improved (e.g. situations where euthanasia is the most humane response). The potential for using social media to communicate with partners and the public has not been explored or developed.

5.8 Operational guidelines

StrandNet depends on productive partnerships underpinned by harmonised operational guidelines. Agreements with stakeholders need to be developed in several areas including:

- Harmonising procedures across jurisdictions.
- Developing prioritisation systems for veterinary attention and necropsies and data and specimen collection, this includes considerations for not only the species and incident involved, but also the level of decomposition and location of the carcass.
- Ensuring that relevant data are linked to the database. An aspirational list for marine megafauna could include: fisheries bycatch and legal and illegal Indigenous harvest.
- Developing species-specific rehabilitation permit conditions for marine mammals and turtles, including requiring rehabilitation centres to make transparent their treatment regimes, necropsy reports, and burial sites.
- Developing a decision support tool for deciding on when it is appropriate to euthanase a stranded animal.
- Developing guidelines for carcass removal and at sea disposal and the associated reporting requirements.

In addition, processes need to be developed to expedite changes to regulations in response to StrandNet data on sources of mortality to megafauna. Examples include:

- Requirements to remove discarded crab pots
- Changes to fishing gear resulting in a high risk of megafaunal entanglements.
-

6.0 RIMReP Indicators from StrandNet Data

Strandnet both directly monitors reported mortalities of marine turtles and marine mammals (e.g. overall strandings rates, age- or cause-specific trends) and provides data to support other monitoring programs.

Major RIMReP indicators from the StrandNet data

The number and spatial distribution of mortalities reported per year for the various taxa in the Reef region: Cheloniidae (mostly green turtles *Chelonia mydas* and loggerheads *Caretta caretta*), Delphinidae (mostly coastal dolphins: Australian humpback, *Sousa sahalensis*; Australian snubfin, *Orcaella heinsohni*; Indo-Pacific bottlenose dolphin, *Tursiops australis*) and the dugong, *Dugong dugon*).

For species such as dugongs and inshore dolphins and green turtles, the annual patterns of mortalities mostly reflect lagged environmental indicators (e.g. Figure 4; Meager and Limpus 2014; Flint et al. 2017). The rate of reported mortalities is also often correlated with the population trend, for example, the rate of reported humpback whale and green turtle mortalities in Queensland has been increasing as the populations have recovered from historical commercial harvesting. However, estimating the actual mortality rate of a population requires knowledge of the reporting rate, which has been estimated elsewhere by capture mark recapture (e.g. Wells et al. 2014) or by using drifter experiments (e.g. Hart et al 2006). When necropsies

are combined with methods such as ageing teeth or tusks by annual increments, strandings programs can also be powerful tool to estimate population parameters required for demographic models (Mannocci et al. 2012).

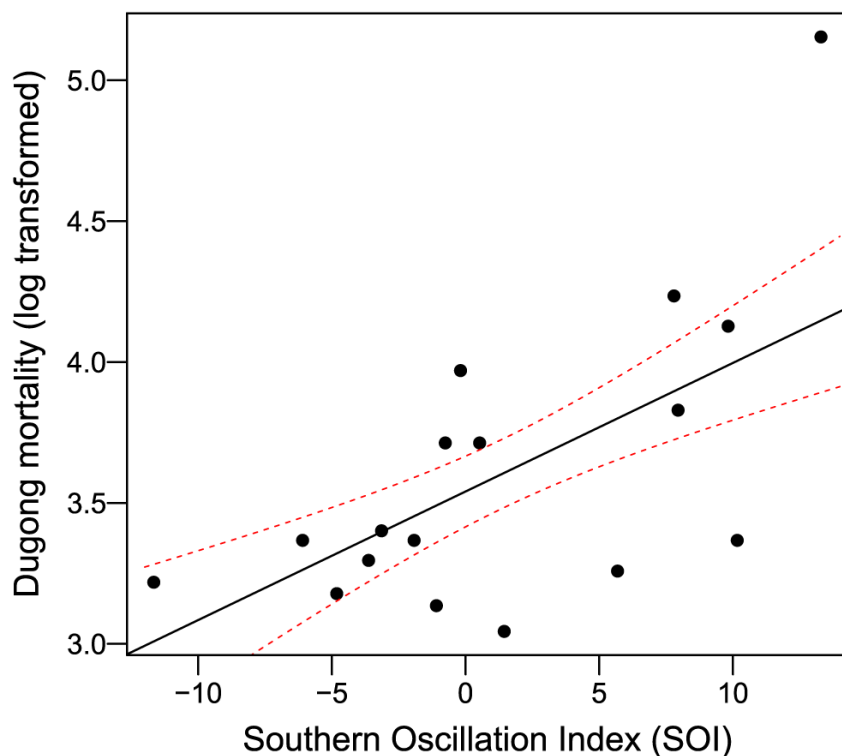


Figure 4. Relationship between annual natural mortality of dugongs and ENSO (SOI, annual average). The model was fit using robust regression (dotted red lines: 90 per cent confidence intervals) and the outlier at the top of the graph is from 2011. Reprinted from Meager and Limpus (2014).

7.0 Recommendations

To improve the StrandNet database so that it can function as a central component of the Megafauna component of the RIMReP program, it is recommended that high priority be given to:

1. Appointing a Queensland Government StrandNet Co-ordinator with responsibilities for data quality assurance, analysis, database maintenance, collating samples, reporting and engagement with key responders (QPWS field staff, DES and the Authority's policy makers, Indigenous rangers, NGOS, Sea World, veterinarians and scientists, local government and the wider community; see Appendix 1).
2. Enhancing or replacing the StrandNet database to improve the functionality of the system as an analytical tool, and to make it more useable and accessible to a wider user group (see Appendix 2).
3. Developing an APP that is integrated into StrandNet to enable more streamlined recording and reporting of data directly by the public.
4. Holding an interagency workshop (DAF, DES, the Authority) workshop with relevant technical experts (megafauna scientists, toxicologists, veterinarians) to determine agreed priorities, triggers and protocols for the necropsy and collection, storage and processing of data and specimen materials from marine wildlife strandings and mortalities along the coast of Queensland from Port Douglas to the Queensland–New South Wales border.

5. Developing Memoranda of Understanding including response protocols with key partners (Sea World, universities, local governments and veterinarians) regarding their roles.
6. Conducting regular training workshops with key first responders. These workshops should be customised to meet the specific needs of the major groups of first responders based on a skills audit.

7.1 Estimated costs of recommendations

StrandNet Co-ordinator	1 FTE Senior Conservation Officer	Recurrent, see Appendix 1
StrandNet database	Refurbish/rebuild database) see Appendix 2	One-off
	Maintenance, licensing and support	Recurrent (currently \$80k p.a.)
APP to enable the better recording and reporting of data by citizen scientists	Development one off	One-off
	Maintenance and support	Recurrent
Interagency workshops		Annual
Training workshops		Annual

8.0 Acknowledgments

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10.0 Appendix 1

Position description StrandNet Co-ordinator



Role description

Position title:	Senior Conservation Officer	Job Ad Ref (JAR):	QLD/ERM28532/11
Type of vacancy:	Permanent full time	Closing date:	Friday, 15 July 2011
Division/Business group:	Water Quality and Aquatic Ecosystem Health, Aquatic Threatened Species and Threatening Processes Unit	Location:	Dutton Park
Classification:	PO3	Contact officer:	Col Limpus
Salary range:	\$67,321 - \$73,520 p.a.	Ph:	(07) 3170 5517
		Total remuneration:	\$76,807 - \$83,879 p.a.

Working for DERM

When you work for the Department of Environment and Resource Management (DERM), you will contribute to conserving and managing the state's natural environment for the benefit of all Queenslanders. Our tasks include promoting sustainable living and resource use, encouraging land managers and the rural industry to take an integrated approach to managing soil, water and vegetation, and strengthening Queensland's response to climate change.

Our key areas of responsibility are:

- Delivering fit-for-purpose services to our clients
- Meeting the challenge of climate change
- Managing Queensland's land, water and vegetation resources responsibly
- Protecting and enhancing the state's natural environment and cultural heritage
- Securing water for Queensland's future

DERM has a culture which values results, professional growth, workforce diversity and a healthy balance between work and life commitments. As a DERM employee, you will be actively encouraged and supported as an individual and will have access to a range of flexible work practices, learning and development opportunities, and study assistance.

The [Applicant Guide](#) outlines further information about requirements of working for DERM. More about the benefits and conditions of working for DERM can be found by reading [Benefits and Conditions](#).
<http://www.derm.qld.gov.au/about/employment/workingatderm.html>

Visit our website <http://derm.qld.gov.au/about/index.html> for additional information about our department.

About this role

This position is responsible for providing scientific/technical support on monitoring the conservation status of marine wildlife as part of the Aquatic Threatened Species and Threatening Processes Unit within the Environment and Resource Sciences Division of DERM. A key role will be coordinating the Marine Wildlife Stranding and Mortality Database (StrandNet) for Queensland and supporting the Chief Scientist in the leadership of the Aquatic Threatened Species and Threatening Processes team.

Duties of the role

To achieve the outcomes required by this role, you must be able to:

- Coordinate the collation of marine wildlife stranding and mortality data from throughout Queensland into the Marine Wildlife Stranding and Mortality Database (StrandNet).
- Provide scientific advice and assistance to regional DERM staff, other organisations and the general public in relation to the impact of threatening processes on marine wildlife.
- Work as a senior member of a team to produce and review technical reports using scientific/technical knowledge and legislation, policy and guidelines for guiding the conservation of marine wildlife.
- Provide support to the Chief Scientist in the leadership of the Aquatic Threatened Species and Threatening Processes team.
- Participate in group projects, research projects and initiatives as a senior officer with the Water Quality and Aquatic Ecosystem Health Group.
- Provide support to the development, implementation and operation of the group's aquatic threatened species databases and other decision support software.

Key attributes

Within the context of the duties described above, the ideal applicant will be someone who has:

- Knowledge of the science relating to marine wildlife, related threatening processes and aquatic ecosystem health together with the methods, standards and guidelines relating to the assessment and monitoring in these fields.
- Knowledge of, and ability to use databases and information sources relevant to marine wildlife (for example StrandNet) to perform statistical analysis of stranding data.
- Confidently and concisely, communicates, consults and liaises, providing written and oral advice on marine wildlife strandings to achieve clear outcomes.
- Undertakes analysis to aid in problem solving and research, shows initiative and commits to action

Mandatory requirements

Qualifications

To be considered for appointment you must have a degree qualification in Science or equivalent.

If your qualification is from an overseas institution, you will need to attach a certified copy of the official recognition to your application (email skillsrecognition@detq.qld.gov.au for more information about obtaining official recognition of your overseas qualification).

Licences

A current A class manual driver's licence.

Citizenship/visa

To be appointed to a permanent position, you must be an Australian citizen, have permanent residency status, or a visa permitting you to work in Australia permanently. For temporary appointments, you must have a visa permitting you to work for the length of the temporary appointment.

Additional factors

A discipline check for applicants already working in the public sector may be undertaken. Further details are available in the Applicant Guide.

Your application will remain current for up to 12 months and you may be contacted regarding other identical vacancies at various locations and for either full time or part time employment.

How you will be assessed

You will be assessed on how you meet the "Key Attributes" (page 2).

We require three (3) pieces of information to make an initial assessment:

1. An application cover sheet (for offline applications only)
2. A response outlining your suitability for the position, with specific examples and which addresses the dot points listed under Key Attributes. Your response should be no more than 2 pages.

3. Your current resume of no more than 6 pages including names and contact details of at least one referee who has knowledge of your work (one of whom is a current supervisor if possible).

The selection panel will assess your ability to perform the work required of the position based on your response and resume, and other selection processes which may include an interview and/or work test.

Referees will be contacted to verify the information you provide and to comment on how well you demonstrate the personal attributes being sought.

For further information on where to send your application and what information to provide in your response and resume, refer to the following section, as well as the "Applicant guide" attached to the Job advertisement or available from <http://www.derm.qld.gov.au/about/employment/workingatderm.html>

How to apply

Please note: the Shared Service Agency does not accept hand-delivered applications. You can submit your application to the Shared Service Agency in any of the following ways:

Online—please follow the steps below:

1. Complete the online application form by clicking on the "Apply Online" button at the bottom of the specific job details page <http://www.jobs.qld.gov.au/>
2. Upload your application (a maximum of three (3) files) using the online system. Please ensure you click the "Submit" button when completed.

Email

Email your application for this position to the following address. Please ensure the completed application form is attached and that you include the JAR in the subject line of your email:

applicationsderm@ssa.qld.gov.au

Post or facsimile

Hardcopy applications should be marked "Private and confidential". Mail your application to:

The Applications Officer DERM
Shared Service Agency
GPO Box 152
Brisbane Qld 4001
Fax: (07) 3006 7713

11.0 Appendix 2

Wish-list of updates to Strandnet database system from 'SuperUsers' in the Queensland Department of Environment and Science, including additional suggestions from the RIMReP meeting of June 11. The SuperUsers are responsible for coordinating data entry and verifying records. The list is in no specific order.

Colour coding of text

- Black text: straightforward recommendation
- Red text: can be implemented by a SuperUser
- Blue text: requires considerable programming or a new system to fix
- Brown text: relates to the spatial 'StrandNet Keymap' function and requires a system rebuild to fix.
- Green text: has been addressed/ or is in progress of being addressed

1. Data 'cleansing'. Batch 'find and replace' redundant codes so that they can be removed from lookup tables, examples include 'A?' and 'I?' from the 'MATURITY' field
2. Phone App to allow the public to directly report photos, GPS location and time to StrandNet
3. System that all allows SCP data to be reported directly into StrandNet without the need for DES to re-enter, which raises the possibility of data entry errors.
4. Ability to enter information and results from necropsies and pathology in a way that can be searched and bulk exported, rather than as PDF attachments.
5. Fix the bug whereby reports that are not 'lodged' are inaccessible to SuperUsers. If the person that entered the data cannot be contacted the record must be deleted and re-entered, which is very time consuming.
6. Ability for the Strandings Coordinator to generate an email list of users to provide updates and notices, which currently has to be done by ITP through request.
7. Not all data can be exported (e.g. related tags) – it is therefore not possible to analyse this data in any detail.
8. Direct ODBC read-only access to enable more streamlined analysis via MS Access, R or MS Power BI. This would allow faster reporting for the quarterly reports and quicker updates.
9. The spatial layers need to be updated. Automated selection of 'location' based on coordinates to verify accuracy of entry and to save manually looking this up.
10. More data entry validation, e.g. autofill tag prefix based on taxon, not allowing records to be verified without an entry for 'pod size' or with both a 'Suspected' and 'Confirmed' cause of death.
11. Field corresponding to each commercial fisheries designation ('symbol') to match bycatch to a specific fishery.
12. The URL and login page need to be updated from 'DERM' to 'DES'
13. Entry of size in metres for marine mammals to stop the ongoing confusion between cm and m
14. Speed up the Key map feature.
15. Review reporting requirements of Regions and include specific fields that can assist with annual reporting, e.g.:
 - a) Drop down box to select if the response was made by QPWS, Volunteers/Community Groups, TO's, Council's would be really useful for Reef and Marine Park annual reporting purposes.

- b) Additional and/or revised pre-defined search area boundaries consistent with DES reporting requirements (we probably need to provide updated boundaries for Marine Park Management Areas).
 - c) Currently using the Marine Park or Management Area search tools is not a useful/accurate option - if a stranding occurs on a beach it might not technically be inside the Marine Park zone, but for reporting purposes we need to be able to capture these incidents and report against them. I currently get around this by using a polygon search that captures a little bit of the land. I'm not sure if there's a way around this. If not it would be extremely helpful to be able to save these polygon parameters for future use to ensure accuracy and consistency of reporting.
 - d) Ability to capture whether the call originated from the RSPCA hotline or not (e.g. a new field to record the RSPCA job number).
16. Ability to generate automatic reports e.g. to provide information similar to what is reported in the annual reports and to help generate analysis similar to what was manually produced following 2011/12 flooding event and put on external website.
 17. Improved Key Map capability. It is currently very slow to load and has very limited spatial capability. It would be useful to have some satellite imagery, ability to turn specific layers on/off (e.g. different boundary layers such as QPWS management areas, StrandNet locations, reefs, Marine Park boundaries etc).
 18. Automatic selection of Local when coordinates are plugged in. Local is very confusing in some locations and this would prevent user errors. Including the Local as a spatial layer in the Key Map might also help with this.
 19. Assess possibility of including a built in resize tool for photos, or allow larger sized photographs.
 20. Ability for SuperUsers to search sightings entered by a community group without having to know their creating user code (e.g. drop down box).
 21. 'Habitat' code is confusing and as a result has not been entered correctly by users for a long time. Logically it would depict where the stranding occurred, but what is wanted is the usual habitat of the animal in question. Suggest either describing this better in the database, or removing altogether.
 22. 'Health/condition' – suggest a code for 'trapped inside crab pot' and 'tangled in crab pot rope'
 23. 'Local' - Can Sandgate/Brighton be added to the description for Nudgee Beach (ie. MN)?
 24. It would be good if you could just leave the address and organisation name blank in the 'Contact Details' (i.e. not mandatory to fill in)
 25. The overall boundary of the Great Sandy Marine Park area needs to be increased to capture the park boundary and beyond + 2 kilometres. Currently if people use the GPS location on the shore it may not be included in the Marine Park. This makes it difficult to search data for GSMP.
 26. Add better fields for capturing whale and dolphin entanglement (towing rope, buoys, netting) and strandings, either under the primary activity section, or health condition or where ever you find suitable.
 27. Include the ability to record if MART team have attendance.
 28. Under location details section-Local add= Burrum Heads, Toogoom, Fraser Island west coast/ Platypus Bay, Inskip Point, Tin Can Bay.
 29. Allow non SuperUsers to have access to habitat and local fields e.g location is one field that is often light on but can make a difference to getting the whole picture and save time.

30. Include new entries to the 'lookup tables' such as 'removal to dunes', and adding rare albatross and other birds and seasnakes (Note: this is partially complete but lookup tables have not yet been completed for all taxa).