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Samples and analyses from the Tasmanian  
cetacean sample catalogue.

Sam Thalmann, Rachael Alderman, Kris Carlyon



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# Samples and analyses from the Tasmanian cetacean sample catalogue.

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## INTRODUCTION

Marine mammals by their very nature are generally elusive and difficult to monitor. Obtaining data that directly improves our understanding of population status, structure, and distribution are often hard to obtain. Similarly, developing our knowledge of the effect of ecological influences on marine mammal populations is resource demanding, and every effort should be made to maximise our opportunity to gather these data.

Regardless of the mechanisms behind cetacean stranding's these events provide a unique opportunity to gain valuable insight into marine mammal ecology and provide an opportunity to collect important biological samples.

Improving the accessibility and awareness of the Tasmanian Government's cetacean biological sample holdings to the broader research community is critical to maximising the value of samples and validating sample collection activities.

This paper reports on the outcomes from a project funded by the Australian Marine Mammal Centre, conducted in 2014/15. The project sought to comprehensively curate and catalogue the >3000 cetacean biological samples collected and held by Department of Primary Industries, Parks, Water and Environment (DPIPWE) and the Tasmanian Museum and Art Gallery (TMAG) by systematically:

1. verifying the status of samples;
2. improving storage of samples and sub-sample where appropriate;
3. updating associated meta-data and make summaries of the collection available via data portals.

The project aim was to verify that samples were stored appropriately; ensure that the collection was secure into the future; and to facilitate access by the research community, helping to maximise the value of the collection, as well as improving efficiencies by potentially minimising unnecessary future sampling of live individuals or destructive sampling.

## **METHODOLOGY**

Samples have mostly been collected from deceased cetaceans during mass and single-animal stranding events, with some biopsy samples also collected from free-ranging animals. The number of samples collected, sample type collected, and the preservation technique has varied over time. To verify the sample collection, a full and systematic inventory of samples in DPIPWE and TMAG storage was undertaken. As each sample was located, it was cross-checked against the DPIPWE database, data updated if necessary, physical assessments of storage containers, replacement where necessary, replenish/replace storage media and relabelling performed.

By reconciling each individual sample against the DPIPWE and TMAG database records we have addressed discrepancies and data gaps, thereby verifying the complete sample collection against the database to ensure accurate and up to date curation. Meta-data summaries will be added to the National Marine Mammal Database, DPIPWE's Natural Values Atlas (NVA) and the Atlas of Living Australia (ALA). Summaries of sample holdings are made available through this report (see Appendices), and will also be included on the DPIPWE website.

## **RESULTS**

Dating from 1862 to the present, the verified sample collection contains 4349 specimens held over two collections at DPIPWE, and TMAG. The collection represents 3079 samples obtained from 892 individuals (DPIPWE) and 1270 samples collected from 1133 individuals within TMAG. The composition of the sample collections reflects the functions within each institution, with an average of over four samples collected from each individual within the DPIPWE collection and an average of only 1.1 samples per individual within TMAG.

There are over 27 sample types within the collection. The majority of material consists of skin samples, intended for genetic studies and confirmation of species identification and gender determination. Blubber, teeth and jaws are also routinely collected. Other less frequently collected sample types include stomach contents, parasites, major organs, dorsal fins, skeletal material and occasionally entire carcasses (Appendix 1 and 2).

The value of such a biological sample collection for improving our understanding of cetacean biology and ecology, and so informing improved management and conservation, is demonstrated by existing examples of analyses that have utilised (or are currently utilising) DPIPWE cetacean samples and associated data. A summary of previous or ongoing research using samples obtained through the Tasmanian Government sample holdings is also provided in this report (see Appendix 3).

The collection meta-data set is to be made publically available through a number data portals including the National Marine Mammal Database (<http://data.marinemammals.gov.au>), DPIPWE's Natural Values Atlas (<https://www.naturalvaluesatlas.tas.gov.au>), and will also be updated on the Atlas of Living Australia (<http://www.ala.org.au>). It is anticipated that this will assist in minimising unnecessary and inefficient duplication of effort or informing important supplement studies.

## **DISCUSSION**

The DPIPWE and TMAG sample collections typically serve different purposes and are the result of distinct functions for each agency. TMAG typically holds limited samples from each individual and samples are held mainly for reference and voucher purposes. DPIPWE however typically collects and stores samples for investigation and research objectives. As such this is reflected in the breakdown of samples held by each agency,

The Tasmanian Government cetacean sample collection holds nearly 3700 individual samples, with the majority of tissue samples collected during the last 30 years. Fluctuating resourcing levels has resulted in varying levels of curation. By reconciling each individual sample against the DPIPWE database records we have addressed discrepancies and data gaps, thereby verifying the complete sample collection against the database to ensure accurate and up to date curation.

Strategic sampling of biological material from stranded marine mammals has the potential to contribute extensively to our understanding of these elusive individuals and populations. A key recommendation from our work is that the effective dissemination of such collections is a critical component to maximise the value of such collections as well as improving efficiencies by potentially minimising unnecessary future sampling of live individuals or destructive sampling.

An important aspect of this project is to generate awareness of the sample collection and sample analyses that have already been undertaken. When disseminated, the meta-data and collection summary outputs resulting from the validation and verification of our sample catalogue will have considerable potential to contribute to a range of national and international management policies and conservation initiatives. For any queries regarding the collection or potential collaborations please contact the corresponding author or email: [whales@dpiipwe.tas.gov.au](mailto:whales@dpiipwe.tas.gov.au).

## **ACKNOWLEDGEMENTS**

This project was funded by the Commonwealth of Australia through the Australian Marine Mammal Centre Grants Program.

**Appendix 1:** Verified cetacean samples held in the DPIPWE collection (from 892 individuals) – table continues over page.

| Species                           | Common name                  | Sample Type |             |          |           |           |          |          |            |            |          |            |          |                   |          |
|-----------------------------------|------------------------------|-------------|-------------|----------|-----------|-----------|----------|----------|------------|------------|----------|------------|----------|-------------------|----------|
|                                   |                              | Baleen      | Blubber     | Brain    | Kidney    | Liver     | Lung     | Heart    | Muscle     | Skin       | Skull    | Stomach    | Testis   | Dorsal fin/flukes | Ear bone |
| <i>Balaenoptera acutorostrata</i> | Minke whale                  |             | 3           |          |           |           |          |          | 1          | 2          |          |            |          |                   |          |
| <i>Balaenoptera bonaerensis</i>   | Antarctic Minke Whale        |             | 4           |          |           |           |          |          |            | 2          |          |            |          |                   |          |
| <i>Balaenoptera edeni</i>         | Bryde's whale                | 1           | 1           |          |           |           |          |          |            | 1          |          |            |          |                   |          |
| <i>Caperea marginata</i>          | Pygmy right whale            | 2           | 20          |          | 4         | 4         |          |          | 9          | 8          | 4        | 1          | 1        |                   |          |
| <i>Delphinus delphis</i>          | Common dolphin               |             | 63          |          | 17        | 20        |          |          | 29         | 45         | 16       | 4          |          |                   | 6        |
| <i>Eubalaena australis</i>        | Southern right whale         | 2           | 3           |          | 1         | 1         | 1        |          | 2          |            |          |            |          |                   |          |
| <i>Globicephala melas</i>         | Long-finned pilot whale      |             | 681         |          | 7         | 7         | 2        |          | 279        | 593        | 84       |            |          |                   |          |
| <i>Grampus griseus</i>            | Risso's dolphin              |             | 23          | 2        | 8         | 8         | 3        | 3        | 5          | 9          | 8        |            |          |                   |          |
| <i>Hyperoodon planifrons</i>      | Southern bottlenose whale    |             | 0           |          |           |           |          |          |            | 1          |          |            |          |                   |          |
| <i>Kogia breviceps</i>            | Pygmy sperm whale            |             | 7           |          | 2         | 2         |          |          | 5          | 3          | 2        | 1          | 1        |                   |          |
| <i>Lagenorhynchus obscurus</i>    | Dusky dolphin                |             | 4           |          | 1         | 1         |          |          | 1          |            |          |            |          |                   |          |
| <i>Lissodelphis peronii</i>       | Southern right whale dolphin |             | 3           |          |           |           |          |          |            |            |          |            |          |                   |          |
| <i>Megaptera novaeangliae</i>     | Humpback whale               |             | 9           |          | 2         | 2         |          |          | 3          | 5          |          |            | 3        |                   |          |
| <i>Mesoplodon bowdoini</i>        | Andrew's beaked whale        |             | 6           |          | 3         | 3         | 1        |          | 2          | 3          |          | 2          | 1        |                   |          |
| <i>Mesoplodon densirostris</i>    | Blainville's beaked whale    |             | 0           |          |           |           |          |          |            | 2          |          |            |          |                   |          |
| <i>Mesoplodon grayi</i>           | Gray's beaked whale          |             | 9           |          |           | 1         |          |          | 3          | 7          | 3        | 1          | 3        |                   |          |
| <i>Mesoplodon hectori</i>         | Hector's beaked whale        |             | 0           |          |           |           |          |          |            | 2          |          |            |          |                   |          |
| <i>Mesoplodon layardii</i>        | Strap-toothed beaked whale   |             | 19          |          | 5         | 6         |          | 2        | 6          | 16         | 1        | 2          |          |                   |          |
| <i>Physeter macrocephalus</i>     | Sperm whale                  |             | 160         |          | 1         | 5         |          |          | 82         | 104        | 7        |            |          |                   |          |
| <i>Stenella coeruleoalba</i>      | Striped dolphin              |             | 0           |          |           |           |          |          |            | 1          |          |            |          |                   |          |
| <i>Tasmacetus shepherdi</i>       | Shepherd's beaked whale      |             | 3           |          | 1         | 1         |          |          | 1          | 1          |          |            |          |                   |          |
| <i>Tursiops truncatus</i>         | Bottlenose dolphin           |             | 44          |          | 5         | 5         | 2        |          | 18         | 48         | 2        |            |          |                   |          |
| <i>Unidentified Delphinidae</i>   | Unidentified dolphin         |             | 1           |          |           | 1         |          |          |            | 1          |          |            |          |                   |          |
| <i>Unidentified Ziphiidae</i>     | Unidentified beaked whale    |             | 1           |          | 1         | 1         |          |          |            | 1          |          |            |          |                   |          |
| <i>Ziphius cavirostris</i>        | Cuvier's beaked whale        |             | 10          |          | 3         | 3         |          |          | 3          | 8          | 1        |            |          |                   |          |
|                                   | <b>Grand total</b>           | <b>5</b>    | <b>1074</b> | <b>2</b> | <b>61</b> | <b>71</b> | <b>9</b> | <b>5</b> | <b>449</b> | <b>863</b> | <b>2</b> | <b>128</b> | <b>9</b> | <b>9</b>          | <b>6</b> |

**Appendix 1:** Verified cetacean samples held in the DPIPWE collection (from 892 individuals) – continued from previous page.

| Species                           | Common name                  | Sample Type |          |           |            |           |           |          |          |          |          |          |          | TOTAL       |
|-----------------------------------|------------------------------|-------------|----------|-----------|------------|-----------|-----------|----------|----------|----------|----------|----------|----------|-------------|
|                                   |                              | Faeces      | Head     | Jaw       | Teeth      | Ovaries   | Parasite  | Spleen   | Barnacle | CAT scan | Foetus   | Milk     | Other    |             |
| <i>Balaenoptera acutorostrata</i> | Minke whale                  |             |          |           |            |           |           |          |          |          |          |          |          | 6           |
| <i>Balaenoptera bonaerensis</i>   | Antarctic Minke Whale        |             |          |           |            |           |           |          |          |          |          |          |          | 6           |
| <i>Balaenoptera edeni</i>         | Bryde's whale                |             |          |           |            |           |           |          |          |          |          |          |          | 3           |
| <i>Caperea marginata</i>          | Pygmy right whale            | 5           |          |           |            | 1         | 1         |          |          |          |          |          |          | 60          |
| <i>Delphinus delphis</i>          | Common dolphin               |             |          |           | 24         | 2         | 5         | 2        |          |          |          |          | 1        | 233         |
| <i>Eubalaena australis</i>        | Southern right whale         |             |          |           |            |           | 2         | 1        | 1        |          |          |          |          | 14          |
| <i>Globicephala melas</i>         | Long-finned pilot whale      | 24          |          |           | 178        |           | 2         |          |          | 3        |          | 2        |          | 1862        |
| <i>Grampus griseus</i>            | Risso's dolphin              | 1           |          |           | 6          |           | 2         |          |          |          |          |          |          | 78          |
| <i>Hyperoodon planifrons</i>      | Southern bottlenose whale    |             |          |           |            |           |           |          |          |          |          |          |          | 1           |
| <i>Kogia breviceps</i>            | Pygmy sperm whale            |             |          |           | 2          | 1         | 1         |          |          |          |          |          |          | 27          |
| <i>Lagenorhynchus obscurus</i>    | Dusky dolphin                |             |          |           |            | 1         | 1         |          |          |          |          |          |          | 9           |
| <i>Lissodelphis peronii</i>       | Southern right whale dolphin |             |          |           |            |           |           |          |          |          |          |          |          | 3           |
| <i>Megaptera novaeangliae</i>     | Humpback whale               |             |          |           |            |           | 2         |          |          |          |          |          |          | 26          |
| <i>Mesoplodon bowdoini</i>        | Andrew's beaked whale        |             |          |           |            | 2         | 1         |          |          |          |          |          | 1        | 24          |
| <i>Mesoplodon densirostris</i>    | Blainville's beaked whale    |             |          |           |            |           |           |          |          |          |          |          |          | 2           |
| <i>Mesoplodon grayi</i>           | Gray's beaked whale          |             |          |           |            | 1         |           |          |          |          |          |          |          | 28          |
| <i>Mesoplodon hectori</i>         | Hector's beaked whale        |             |          |           |            |           |           |          |          |          |          |          |          | 2           |
| <i>Mesoplodon layardii</i>        | Strap-toothed beaked whale   |             |          |           |            | 3         | 2         |          |          | 2        |          |          |          | 64          |
| <i>Physeter macrocephalus</i>     | Sperm whale                  | 10          |          | 23        | 39         |           | 7         |          | 1        | 1        |          |          |          | 440         |
| <i>Stenella coeruleoalba</i>      | Striped dolphin              |             |          |           |            |           |           |          |          |          |          |          |          | 1           |
| <i>Tasmacetus shepherdi</i>       | Shepherd's beaked whale      | 1           |          |           |            |           |           |          |          |          |          |          |          | 8           |
| <i>Tursiops truncatus</i>         | Bottlenose dolphin           |             | 1        |           | 12         | 1         | 1         |          | 1        | 2        | 2        |          |          | 144         |
| <i>Unidentified Delphinidae</i>   | Unidentified dolphin         |             |          |           |            |           |           |          |          |          |          |          |          | 3           |
| <i>Unidentified Ziphiidae</i>     | Unidentified beaked whale    |             |          |           |            |           |           |          |          | 1        |          |          |          | 5           |
| <i>Ziphius cavirostris</i>        | Cuvier's beaked whale        | 1           |          |           |            |           | 1         |          |          |          |          |          |          | 30          |
|                                   | <b>Grand total</b>           | <b>42</b>   | <b>1</b> | <b>23</b> | <b>261</b> | <b>12</b> | <b>28</b> | <b>3</b> | <b>3</b> | <b>9</b> | <b>2</b> | <b>2</b> | <b>2</b> | <b>3079</b> |

**Appendix 2:** Verified cetacean samples held in the TMAG collection (from 1133 individuals). – table continues over page.

| Species                           | Common name                  | Sample Type |           |          |          |           |          |          |           |            |           |          |          |
|-----------------------------------|------------------------------|-------------|-----------|----------|----------|-----------|----------|----------|-----------|------------|-----------|----------|----------|
|                                   |                              | Baleen      | Blubber   | Brain    | Kidney   | Liver     | Lung     | Heart    | Muscle    | Skin       | Skull     | Stomach  | Testis   |
| <i>Balaenoptera acutorostrata</i> | Minke whale                  | 2           |           |          | 1        | 3         |          |          | 1         | 4          | 3         | 1        | 1        |
| <i>Balaenoptera bonaerensis</i>   | Antarctic Minke Whale        | 1           |           |          |          |           |          |          |           |            | 1         |          |          |
| <i>Balaenoptera physalus</i>      | Fin whale                    | 1           |           |          |          |           |          |          |           |            |           |          |          |
| <i>Caperea marginata</i>          | Pygmy right whale            | 8           | 4         | 1        |          |           |          |          | 2         | 7          | 7         |          |          |
| <i>Delphinus delphis</i>          | Common dolphin               |             |           |          |          | 3         |          |          |           | 16         | 9         |          |          |
| <i>Globicephala melas</i>         | Long-finned pilot whale      |             | 27        |          |          | 62        |          |          | 23        | 680        |           | 1        |          |
| <i>Globicephala sp.</i>           | Unidentified pilot whale     |             |           |          |          |           |          |          |           | 2          |           |          |          |
| <i>Grampus griseus</i>            | Risso's dolphin              |             |           |          |          |           |          |          |           |            |           |          |          |
| <i>Hyperoodon planifrons</i>      | Southern bottlenose whale    |             |           |          |          |           |          |          |           | 1          | 1         |          |          |
| <i>Kogia breviceps</i>            | Pygmy sperm whale            |             |           |          |          |           |          |          |           | 2          | 2         |          |          |
| <i>Lissodelphis peronii</i>       | Southern right whale dolphin |             |           |          |          | 1         |          |          |           | 2          | 3         |          |          |
| <i>Megaptera novaeangliae</i>     | Humpback whale               |             | 1         |          |          |           |          |          |           | 2          |           |          |          |
| <i>Mesoplodon bowdoini</i>        | Andrew's beaked whale        |             |           |          | 1        | 1         | 1        | 1        | 1         | 3          | 1         | 1        | 1        |
| <i>Mesoplodon densirostris</i>    | Blainville's beaked whale    |             |           |          |          |           |          |          |           | 2          | 2         |          |          |
| <i>Mesoplodon grayi</i>           | Gray's beaked whale          |             |           |          |          |           |          |          |           | 2          | 5         |          |          |
| <i>Mesoplodon hectori</i>         | Hector's beaked whale        |             |           |          |          |           |          |          |           | 3          | 1         |          |          |
| <i>Mesoplodon layardii</i>        | Strap-toothed beaked whale   |             |           |          |          |           |          |          |           | 10         | 8         |          |          |
| <i>Orcinus orca</i>               | Killer whale                 |             |           |          |          |           |          |          |           | 3          |           | 1        |          |
| <i>Phocoena dioptrica</i>         | Spectacled porpoise          |             |           |          |          |           |          |          |           | 1          |           |          |          |
| <i>Physeter macrocephalus</i>     | Sperm whale                  |             | 4         |          | 1        | 1         | 1        |          | 1         | 136        | 2         |          |          |
| <i>Tasmacetus shepherdi</i>       | Shepherd's beaked whale      |             |           |          |          |           |          |          |           | 1          |           |          |          |
| <i>Tursiops truncatus</i>         | Bottlenose dolphin           |             | 11        |          | 2        | 5         | 2        |          | 5         | 21         | 6         |          |          |
| <i>Unidentified Odonticeti</i>    | Unidentified toothed whale   |             |           |          |          |           |          |          |           |            | 1         |          |          |
| <i>Unidentified Ziphiidae</i>     | Unidentified beaked whale    |             |           |          |          | 1         |          |          |           | 2          | 3         |          |          |
| <i>Ziphius cavirostris</i>        | Cuvier's beaked whale        |             | 1         |          |          |           |          |          |           | 5          | 7         |          |          |
|                                   | <b>Grand total</b>           | <b>12</b>   | <b>48</b> | <b>1</b> | <b>5</b> | <b>77</b> | <b>4</b> | <b>1</b> | <b>33</b> | <b>905</b> | <b>62</b> | <b>4</b> | <b>2</b> |

**Appendix 2:** Verified cetacean samples held in the TMAG collection (from 1133 individuals). – continued from previous page

| Species                           | Common name                  | Sample Type       |          |          |           |           |          |           |          |              |          | Total       |
|-----------------------------------|------------------------------|-------------------|----------|----------|-----------|-----------|----------|-----------|----------|--------------|----------|-------------|
|                                   |                              | Dorsal fin/flukes | Ear bone | Head     | Jaw       | Teeth     | Parasite | Skeleton  | Foetus   | Whole animal | Other    |             |
| <i>Balaenoptera acutorostrata</i> | Minke whale                  |                   |          |          |           |           |          |           |          |              |          | 16          |
| <i>Balaenoptera bonaerensis</i>   | Antarctic Minke Whale        |                   |          |          |           |           |          |           |          |              |          | 2           |
| <i>Balaenoptera physalus</i>      | Fin whale                    |                   |          |          |           |           |          | 1         |          |              |          | 2           |
| <i>Caperea marginata</i>          | Pygmy right whale            |                   |          | 1        | 3         |           |          | 3         |          |              |          | 36          |
| <i>Delphinus delphis</i>          | Common dolphin               |                   |          | 4        |           |           |          |           |          |              | 1        | 32          |
| <i>Globicephala melas</i>         | Long-finned pilot whale      |                   |          |          | 17        | 1         |          | 1         | 1        | 1            |          | 814         |
| <i>Globicephala sp.</i>           | Unidentified pilot whale     |                   |          |          |           |           |          |           |          |              |          | 2           |
| <i>Grampus griseus</i>            | Risso's dolphin              |                   |          |          |           | 2         |          | 3         |          |              |          | 5           |
| <i>Hyperoodon planifrons</i>      | Southern bottlenose whale    |                   |          |          |           |           |          | 1         |          |              |          | 3           |
| <i>Kogia breviceps</i>            | Pygmy sperm whale            |                   |          |          |           |           |          |           |          |              |          | 4           |
| <i>Lissodelphis peronii</i>       | Southern right whale dolphin |                   |          |          |           | 1         |          | 2         |          |              |          | 9           |
| <i>Megaptera novaeangliae</i>     | Humpback whale               |                   |          | 1        |           |           |          |           |          |              |          | 4           |
| <i>Mesoplodon bowdoini</i>        | Andrew's beaked whale        | 1                 |          | 1        |           |           | 1        |           |          |              |          | 14          |
| <i>Mesoplodon densirostris</i>    | Blainville's beaked whale    |                   |          |          |           |           |          |           |          |              |          | 4           |
| <i>Mesoplodon grayi</i>           | Gray's beaked whale          |                   |          |          |           |           |          |           |          |              |          | 7           |
| <i>Mesoplodon hectori</i>         | Hector's beaked whale        |                   |          |          |           | 1         |          |           |          |              |          | 5           |
| <i>Mesoplodon layardii</i>        | Strap-toothed beaked whale   |                   |          |          |           |           |          |           |          |              |          | 18          |
| <i>Orcinus orca</i>               | Killer whale                 |                   |          |          |           |           |          |           |          |              |          | 4           |
| <i>Phocoena dioptrica</i>         | Spectacled porpoise          |                   |          |          |           |           |          |           |          |              |          | 1           |
| <i>Physeter macrocephalus</i>     | Sperm whale                  |                   |          |          | 1         | 60        |          |           |          |              |          | 207         |
| <i>Tasmacetus shepherdi</i>       | Shepherd's beaked whale      |                   |          |          |           |           |          |           |          |              |          | 1           |
| <i>Tursiops truncatus</i>         | Bottlenose dolphin           |                   |          | 2        | 1         |           |          | 2         |          | 1            | 1        | 58          |
| <i>Unidentified Odonticeti</i>    | Unidentified toothed whale   |                   |          |          |           |           |          |           |          |              |          | 1           |
| <i>Unidentified Ziphiidae</i>     | Unidentified beaked whale    |                   |          |          |           |           |          |           |          |              |          | 6           |
| <i>Ziphius cavirostris</i>        | Cuvier's beaked whale        |                   | 1        |          |           |           |          | 1         |          |              |          | 15          |
|                                   | <b>Grand total</b>           | <b>1</b>          | <b>1</b> | <b>9</b> | <b>22</b> | <b>65</b> | <b>1</b> | <b>14</b> | <b>1</b> | <b>2</b>     | <b>2</b> | <b>1270</b> |



**Appendix 3:** Summary of previous and ongoing research and analyses utilising samples sourced from the Tasmanian Government cetacean sample collection, separated by individual study.

| SPECIES   | ANALYSIS   | PURPOSE   | SAMPLE TYPE USED | N INDIVIDUALS | N SAMPLING EVENTS | DPIPWE D'BASE STRANDING ID               | CETACEAN ID (BIOPSIES)                 | FURTHER INFORMATION           |
|---|--|---|------------------|---------------|-------------------|--|--|-------------------------------|
| <b>Andrews Beaked whale (Mesoplodon bowdoini)</b>       | Genetic sequencing (mtDNA control region)                            | Species and sex confirmation  | Skin             | 1             | 1 stranding       | 1137373458                               |  | Internal DPIPWE report        |
| <b>Antarctic minke whale (Balaenoptera bonaerensis)</b> | Genetic sequencing (mtDNA control region)                            | Species confirmation  | Skin             | 2             | 2 strandings      | 1383272988, -1209325878                  |  | Internal DPIPWE report        |
| <b>Blue whale (Balaenoptera musculus)</b>               | Genetic sequencing (mtDNA control region)                            | Species and sex confirmation  | Skin             | 2             | 2 biopsies        |  | 172303026 and 1404888341               | Internal DPIPWE report        |
| <b>Bottlenose dolphin (Tursiops truncatus)</b>          | Genetic sequencing (mtDNA control region)                            | Species identification  | Skin             | 42            | 1 stranding       | 1276838809                               |  | Internal DPIPWE report        |
|   | Genetic sequencing (mtDNA control region)                            | Phylogenetic analyses   | Skin             | 13            | 13 biopsies       |  | TTRU_220508_FRE and TADU_260808_FRE_01 | Results Pending               |
|   | Heavy metal analysis   | Determine heavy metal concentration in stranded dolphins                                | Liver and kidney | 24            | 1 stranding       | 1276838809                               |  | Internal DPIPWE report        |
|   | Genetic analyses   | Phylogenetic analyses   | Skin             | 4             | 3 strandings      | 1294354660 (x2), 1300156674, -1197645619 |  | Results Pending               |
|   | Morphology   | Phylogenetic analyses   | Skull            | 1             | 1 stranding       | -1717265975, -1717265975                 |  | Results Pending               |
|   | Diet analysis  | Investigate diet of T. truncatus stranded in Tasmania                                   | Stomach contents | 3             | 3 strandings      | 124, 158                                 |  | Gales et al. 1992             |
| <b>Bryde's whale (Balaenoptera edeni)</b>               | Genetic sequencing (mtDNA control region)                            | Species and sex confirmation  | Skin             | 1             | 1 stranding       | 1360814277                               |  | Internal DPIPWE report        |
| <b>Common dolphin (Delphinus delphis)</b>               | Genetic sequencing (mtDNA control region and 14 microsatellite loci) | Population structure and management units of D. delphis subject to fisheries bycatch in | Skin             | 15            |                   |  |  | Bilgmann et al. 2008, GenBank |

| southern Australia  |   |  |                  |               |                   |  |                        |                               |
|---|---|--|------------------|---------------|-------------------|--|------------------------|-------------------------------|
| SPECIES   | ANALYSIS  | PURPOSE  | SAMPLE TYPE USED | N INDIVIDUALS | N SAMPLING EVENTS | DPIPWE D'BASE STRANDING ID                       | CETACEAN ID (BIOPSIES) | FURTHER INFORMATION           |
|   | Genetic sequencing (mtDNA control region and 7 microsatellite loci) | Population structure of <i>D. delphis</i> in southern Australia  | Skin             | 20            | 8 strandings      |  |                        | Bilgmann et al. 2014, GenBank |
| <b>Dwarf minke whale</b><br><i>(Balaenoptera acutorostrata)</i> | Visual  | Species identification and museum collection                     | Baleen           | 1             | 1 stranding       | 58   |                        | sample lodged SA museum       |
|   | Genetic sequencing (mtDNA control region)                           | Species confirmation   | Skin             | 4             | 4 strandings      | 1130108616, -1078399311, -1869076667, 1406257544 |                        | Internal DPIPWE report        |
| <b>Gray's beaked whale</b><br><i>(Mesoplodon grayi)</i>         | Genetic sequencing  | Gray's beaked whale genetics                                     | Skin             | 2             | 2 strandings      | 1330907007, 463976401                            |                        | GenBank                       |
|   | Genetic sequencing (mtDNA control region)                           | Species and sex confirmation                                     | Skin             | 1             | 1 stranding       | -413058960                                       |                        | Internal DPIPWE report        |
| <b>Hector's beaked whale</b><br><i>(Mesoplodon hectori)</i>     | Genetic sequencing (mtDNA control region)                           | Species and sex confirmation                                     | Skin             | 1             | 1 stranding       | 64358151   |                        |                               |
| <b>Humpback whale</b><br><i>(Megaptera novaeangliae)</i>        | Genotyping (10 microsatellite loci)                                 | Genetic differentiation of Australian humpback whale populations | Skin             | 70            | 70 biopsies       |  |                        | Schmitt et al. 2014           |
|   | Stable isotopes   | Insight into feeding location, fasting duration, duration of     | Baleen           | 2             | 2 strandings      | 555544922, 914545423                             |                        | Results Pending               |

|  |  | maternal provisioning<br>and weaning  |               |              |              |  |                             |
|--|--|---|---------------|--------------|--------------|--|-----------------------------|
| <b>Long-finned pilot whale (<i>Globicephala melas</i>)</b> | Organic pollutant testing                                      | Identification of POPs in stranded Tasmanian cetaceans                                    | Blubber       | 1            | 1 stranding  | 94   | Symons et al. 2003          |
|  | Genetic sequencing (mtDNA control region)                      | Population structure  | Skin          | 215          | 6 strandings | 94, 1046605252, 1072054000, 1103089108, 1179807296 | Oremus et al. 2009, GenBank |
|  | Molecular determination of gender                              | Determine gender of satellite-tagged whales   | Skin          | 5            | 1 stranding  | 1231450668   | Gales et al. 2012           |
|  | Genetic sequencing (mtDNA control region)                      | Evidence of multiple matriline and spatial disruption of kinship bonds in mass strandings | Skin          | 215          | 5 strandings | 94, 1046605252, 1072054000, 1103089108, 1179807296 | Oremus et al. 2013          |
|  | Organic pollutant testing                                      | Assessment of POP concentrations in different demographics                                | Blubber       | 115          | 4 strandings | 1231450668, 1237951211, 1296184696, 1300746185     | Weijs et al. 2013           |
|  | PCB bioaccumulation and pharmacokinetic modelling              | Model kinetics of pollutants in male long-finned pilot whales.                            | Blubber       | 38           | 2 strandings | 1231450668, 1237951211                             | Weijs et al. 2014           |
|  | Investigation of dentine layers in stained and sectioned teeth | Estimation of age, and variation in energetic and trophic variability during lifetime     | Teeth         | 21           | 1 stranding  | 1836352224   | Results Pending             |
| Diet analysis  | Investigate diet of <i>G. melas</i> stranded in Tasmania       | Stomach contents  | 2             | 2 strandings |              | Gales et al. 1992                                  |                             |
| <b>Pygmy right whale (<i>Caperea marginata</i>)</b>        | Genetic sequencing (mtDNA control region)                      | Species confirmation  | Skin          | 2            | 1 stranding  | -1361100797  | Internal DPIPWE report      |
|  | Visual   | Museum collection   | Skeleton      | 1            | 1 stranding  | 447  | Lodged in SA Museum         |
|  | Iron concentration   | Iron storage and defecation in cetaceans  | Faecal matter | 1            | 1 stranding  | 453  | Results Pending             |

|  |  |   |                  |   |              |  |                        |
|--|--|---|------------------|---|--------------|--|------------------------|
| <b>Pygmy sperm whale</b><br>( <i>Kogia breviceps</i> )               | Diet analysis  | Investigate diet of <i>K. breviceps</i> stranded in Tasmania  | Stomach contents | 2 | 1 stranding  | 91   | Beasley et al. 2013    |
| <b>Risso's dolphin</b><br>( <i>Grampus griseus</i> )                 | Diet analysis  | Identification of stomach contents as part of stranding investigation                                 | Stomach contents | 3 | 3 strandings | 1416801980, -1089844449, -1083504254   | Results Pending        |
|  | Biotoxin and heavy metal testing                                     | Investigation of cause of large-scale mortality event   | Liver and kidney | 9 | 9 strandings | 1416801980, -1773397124, -1083504254, -1422326684, -1422323656, -308267575, -785566603, -650004344, -1089844449, | Results Pending        |
| <b>Southern bottlenose whale</b><br>( <i>Hyperoodon planifrons</i> ) | Genetic sequencing (mtDNA control region)                            | Species and sex confirmation  | Skin             | 1 | 1 stranding  | 1398664728   | Internal DPIPWE report |
| <b>Southern right whale</b><br>( <i>Eubalaena australis</i> )        | Genetic sequencing (mtDNA control region and 13 microsatellite loci) | Population structure of southern right whales in Australia and NZ                                     | Skin             | 3 | 3 biopsies   | TAS0701, TAS0702, TAS0703  | Internal DPIPWE Report |
|  | Genetic sequencing (mtDNA control region and 13 microsatellite loci) | Global population structure and connectivity of southern right whales and fidelity to feeding grounds | Skin             | 7 | 7 biopsies   | TAS1207, TAS1201, TAS1210, TAS1215, TAS1213, TAS1231, TAS1232  | Results Pending        |
|  | Stable isotopes  | Fidelity to feeding grounds   | Skin             | 7 | 7 biopsies   | TAS1207, TAS1201, TAS1210, TAS1215, TAS1213, TAS1231, TAS1233  | Results Pending        |
|  | Iron concentration   | Iron storage and defecation in cetaceans  | Faecal matter    | 1 | 1 stranding  | 1406249150   | Results Pending        |
|  | Genetic sequencing (mtDNA control region)                            | Species and sex confirmation  | Skin             | 7 | 7 biopsies   | TAS1207; TAS1201 TAS1210; TAS1215; TAS1213; TAS1231; TAS1232   | Internal DPIPWE report |

|  |  |   |         |    |              |  |                        |
|--|--|---|---------|----|--------------|--|------------------------|
| <b>Southern right whale dolphin (<i>Lissodelphis peroni</i>)</b> | Next generation sequencing   | Cetacean phylogeny  | Skin    | 1  | 1 stranding  | 1094616663   | Results Pending        |
| <b>Sperm whale (<i>Physeter macrocephalus</i>)</b>               | Organic pollutant testing  | Identification of POPs in stranded Tasmanian cetaceans                                | Blubber | 7  | 2 strandings | 86, -770927380   | Symons et al. 2003     |
|  | Genetic sequencing (mtDNA control region and 13 microsatellite loci) | Population structure of sperm whales  | Skin    | 48 | 2 strandings | ID -2070887088, -72150957  | Results Pending        |
|  | Epigenetic aging   | Molecular age estimation  | Skin    | 12 | 2 strandings | ID -2070887088, -529782718   | Results Pending        |
|  | Investigation of dentine layers in stained and sectioned teeth       | Estimation of age, and variation in energetic and trophic variability during lifetime | Teeth   | 37 | 9 strandings | 86, -770927380, 2132258891, 1387505334, 1436809230, -529782718, 1154648229, 2139071659, -1928265777, | Results Pending        |
| <b>Strap-toothed beaked whale (<i>Mesoplodon layardii</i>)</b>   | Genetic sequencing (mtDNA control region)                            | Species and sex confirmation  | Skin    | 1  | 1 stranding  | 127  | Internal DPIPWE report |
|  | Genetic sequencing (mtDNA control region)                            | Species and sex confirmation  | Skin    | 2  | 2 strandings | 725423404, -1317880215   | Internal DPIPWE report |