Standard Operating Procedure

SC25-15 SCIENTIFIC SAMPLING OF STRANDED MARINE MAMMALS (OCTOBER 2025)

Animal welfare is the responsibility of all personnel involved in the care and use of animals for scientific purposes.

Personnel involved in an Animal Ethics Committee approved project should read and understand their obligations under the *Australian code for the care and use of animals for scientific purposes*.

Version 1.0

October 2025

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

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October 2025

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Revision History Log

Version	Date	Details	Author/Reviewer	Approved By	Approval
1.0	31/10/2025	Document created	Dr Holly Raudino, Dr Kelly Waples, and Dr Erina Young.	J. Richards	October 2025

Approvals: Version 1.0

Approved by the DBCA Animal Ethics Committee:

Jacqui Richards
Chairperson, Animal Ethics Committee
Department of Biodiversity, Conservation and Attractions

Contents

1 Acknowledgements

This standard operating procedure was originally developed by Holly Raudino and Kelly Waples, with significant contributions from Erina Young, Nahiid Stephens, Simone Vitali and Perth Zoo Veterinary Department staff.

2 Purpose

This Standard Operating Procedure (SOP) describes the protocols, equipment and processes for collecting biological samples and morphometric data from stranded marine mammals that are alive, have died or been euthanased. While these events are unfortunate, they offer the opportunity to gain a better understanding and new information on marine mammal species biology, ecology, population parameters and health. This information can help inform decision making and management actions to mitigate pressures on these species. Sampling of dead and live marine mammals is included in the Department's incident management framework and scientific sampling is undertaken by those tasked to do so, within the Scientific or Veterinary teams. If the marine mammals are alive this may be undertaken by a suitably qualified veterinary professional, if the marine mammals are dead, this may be undertaken by a biologist or a volunteer under the direction of a suitably qualified and experienced scientist.

3 Scope

This SOP has been written specifically for scientific and education purposes, and approved by the Department of Biodiversity, Conservation and Attractions' (DBCA) Animal Ethics Committee (AEC). However, this SOP may also be appropriate for other situations.

This SOP applies to all marine mammal stranding events and staff tasked with the scientific sampling of stranded marine mammals undertaken across Western Australia by DBCA (hereafter department) personnel. It may also be used to guide fauna related activities undertaken by Natural Resource Management groups, consultants, researchers and any other individuals or organisations. All department personnel involved in stranding incident response should be familiar with the content of this document.

This SOP complements the *Australian code of practice for the care and use of animals for scientific purposes* (The Code). The Code provides the ethical framework and governing principles to guide decisions and actions of all those involved in the care and use of animals for scientific purposes and should be referred to for all AEC approved projects. A copy of the code may be viewed by visiting the National Health and Medical Research Council website (https://www.nhmrc.gov.au/about-us/publications/australian-code-care-and-use-animals-scientific-purposes).

4 Animal Welfare Considerations

To reduce the level of impact of scientific sampling on stranded marine mammals and on the welfare of these animals, personnel must consider, address and plan for the range of welfare impacts that may be encountered. All personnel and volunteers involved in stranding response should be aware of the range of issues that they may encounter, the options that are available for reducing impacts and improving animal welfare, and the process for managing adverse events.

Department research projects involving scientific sampling of stranded marine mammals will require approval from the department's AEC. Key animal welfare considerations that should be considered when sampling are listed below and highlighted throughout the document.

4.1 Injury and unexpected deaths

The result of stranding events is often death or euthanasia of the affected individuals because they usually come ashore in a compromised condition. If adverse events including injury, unexpected deaths or unplanned requirement for euthanasia occur when sampling live animals, it is essential to consider the possible causes and take action to prevent further issues. Adhering to the guidance in this SOP will assist in minimising the likelihood of adverse events. For guidance on field euthanasia procedures see department SOP for *Euthanasia of Animals Under Field Conditions (*pinnipeds (seals and sea lions) and sirenians (dugong)) and *Euthanasia of Small Stranded Cetaceans* (<6 metres). For marine mammals >6 metres the National euthanasia guidelines for stranded large whales should be followed. Where infectious disease is suspected, refer to the department SOP for *Managing Disease Risk and Biosecurity in Wildlife Management* for further guidance.

4.2 Level of impact

Potential animal welfare impacts on wildlife during scientific sampling of stranded marine mammals include:

- Stress (caused by being approached, handled or sampled when already in a compromised state, social isolation, separation of mother and young).
- Distress (caused by seeing other conspecifics either alive or dead being sampled).
- Health impacts from wounds caused by the sampling that may cause pain and be prone to infection.
- Transfer of disease or pathogens between individuals. Note that these impacts occur when there are animals present, and pathogens can be transmitted from both dead and live animals.

Planning must involve identification and mitigation of all potential welfare risks to minimise their impact as much as possible. Note that whilst these impacts are specifically associated with the collection of morphometric data and biological samples, an animal may also experience other impacts during a stranding event from associated procedures such as handling and transport. Investigators must be aware that the effects of a series of stressors may be cumulative and further stress an already compromised stranded marine mammal.

5 Procedure Outline

5.1 Basic sampling

The extent to which samples are obtained will depend on the location, local conditions, staff experience and resourcing available. At all marine mammal events there will be a minimum set of data and sampling required to be able to meet State, National and International reporting requirements on any potential emerging health issues or pressures. These data are detailed in the Marine Mammal Incident Report Form at Appendix 1. This form should be

filled in completely for each incident and for each individual, with a subset of the information specific to sample collection. For each individual marine mammal at an incident the minimum sampling protocol should include the following:

a) Total length of each individual measured on the straight from fluke notch (cetaceans and sirenians) to beak tip or hind flippers to nose in pinnipeds.

b) Location, coordinates recoded in decimal degrees as well as a text description of nearest beach and town.

c) A set of photos (see below) including lateral photos showing colouration and any injuries, wounds or identifying features and ventral surface photos showing genitals so that sex can be determined from visual observation. This will differ between cetaceans, sirenians and pinnipeds (Marine Mammal Incident Response Form at Appendix 1).

d) A tooth count of all teeth on each side of the upper and lower jaw, recorded as two separate numbers and a total.

e) Small tissue sample for DNA (ideally it includes skin and blubber as the best quality DNA is at the interface of these). This can be the size of a fingernail and stored in a 2ml plastic Eppendorf vial (See Figure 1 below). Figure 2 depicts an appropriate location to collect the tissue sample for a cetacean. For pinnipeds this may be most easily accessed on the edge of the flippers, on cetaceans below the dorsal fin on the lateral side (see diagram) and similarly for dugong.

f) Species identification (if known), although photographs, measurements, tooth count and DNA can be used to confirm this.

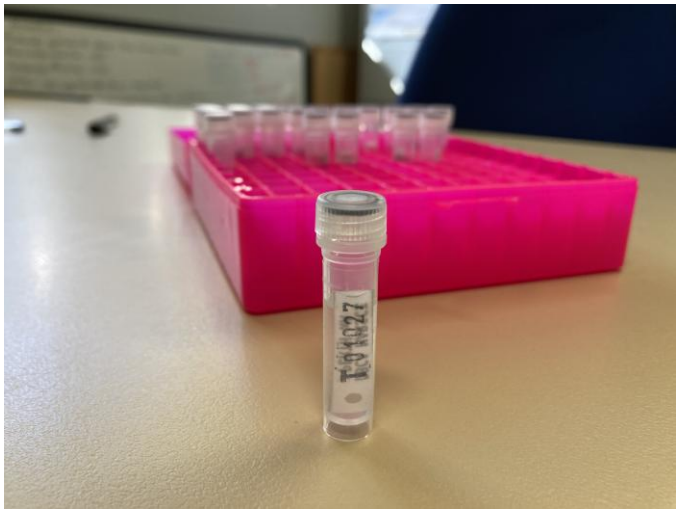

Figure 1 2mL Eppendorf tube with 100% ethanol and waterproof label for storing tissue sample.

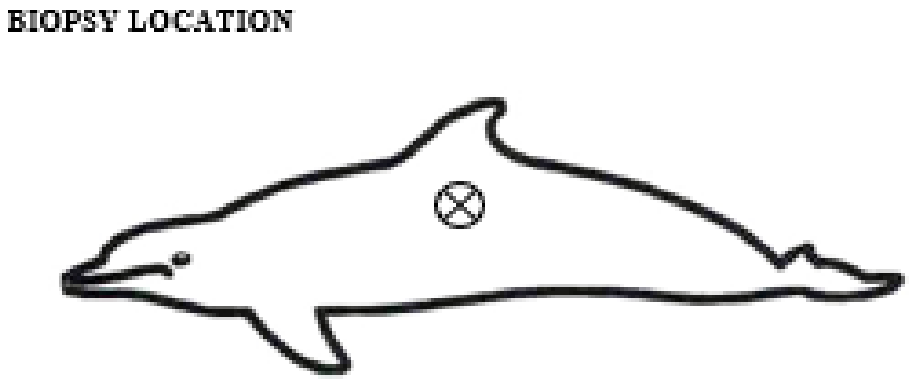

Figure 2 Suitable location to collect a biopsy or tissue sample from a cetacean.

5.1.1 Photographs

Where photos can be taken without undue animal stress, take the following views if possible (listed in order of priority):

a) Whole animal lateral side view with the individual's pigmentation patterns clear, if possible both sides but this may not be possible depending on the size and how it's situated/lying.

b) Whole head side view.

c) Tail fluke from above (try to get the whole of the span).

d) Pectoral fin from above.

e) Dorsal fin side view.

f) Any significant markings or injuries – take a wide shot to show location in relation to the whole animal, then a close-up.

g) Genital slit and anus in the same view to verify the sex.

h) Open mouth showing teeth or baleen, to assist with identification (dead animals only).

5.1.2 Location

Take photos of the location as well as a full scene of the stranding, so that the topography of the beach can be recorded and the pattern in which the animal/s came ashore can be noted. If animals have been moved from their original positions on the beach beforehand, please note this.

ANIMAL WELFARE: Minimise the number of people, noise and physical contact with live stranded marine mammals as much as possible to minimise stress.

5.2 Mass strandings

A stranding is considered a 'mass stranding' where it involves more than a single individual or more than a cow/calf pair. More intensive sampling may be required for such a stranding, particularly if it is considered an unusual mortality event. Basic sampling as described above (section 5.1) is required and needs to be undertaken for every individual.

Ideally all individuals should be intensively sampled and a comprehensive postmortem examination completed. Where this is not possible, a subset of the pod will need to be

sampled instead of every individual. As a general guide if >10 individuals then a minimum of 10% but ideally 25% of the pod or group should be sampled. This should include a mix of males, females and age classes. A separate data sheet should be used to record the collection of samples and morphometric details for each individual that is sampled.

Individuals that have been assessed and are ready to be released and re-floated should be marked. If veterinary staff or those with suitable experience are available this may include a temporary tag (see Figure 3) for sirenians or cetaceans or microchip. Temporary tags should be placed towards the middle of the animal, near the dorsal fin. Hot branding is not considered an ethical form of marking. Temporary identification marks will prevent resampling the same individuals (Beausoleil et al. 2004).

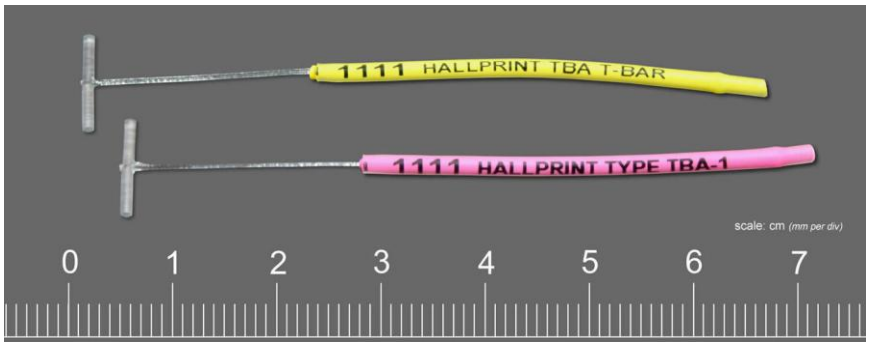

Figure 3 Example of a temporary tag – spaghetti tag, more commonly used on fish.

5.3 Sampling priorities

The condition of the carcass and time since stranding for dead specimens will determine what sampling can be done and the usefulness of the associated samples. This is tabulated below (Table 1.) and includes how the samples will be used for example for disease or pathogen investigation or other. Generally sampling should occur within the first 48 hours since stranding for samples to be suitable for disease and pathology investigation. However, in some cases even skeletal or mummified remains may yield useable samples, for example for genetic analyses from skin or muscle, or age and stable isotope analysis to investigate diet from teeth. Rare specimens including skulls and skeletons may also be of interest for curation into national collections such as the museum.

If postmortem is not possible within 72 hours for a freshly deceased animal, then it should be frozen. Postmortems are preferably performed on fresh carcasses, as freezing can obscure subtle pathology and reduce the viability of microbes, impacting tests such as microbiological culture. Carcasses should be placed in a leak-proof body bag and placed on ice or wrapped and sealed in garbage bags/heavy duty plastic and kept in the shade if cooling is unavailable.

Swabs should be collected as well as samples for toxicology/heavy metal testing first, so as not to contaminate samples for microbiological cultures and biotoxin investigation.

Table 1. Sampling priorities possible for stranded marine mammals, according to freshness of carcass and purpose of sample and investigation.

Carcass condition	Postmortem procedures to complete (if possible)	Pathology samples to collect (if possible)	Archival samples to collect (if possible)	Purpose
<24 hours Code 2 – fresh Normal appearance, usually with little scavenger damage; fresh smell; minimal drying and wrinkling of skin, eyes and mucous membranes; eyes clear; carcass not bloated, tongue and penis not protruded.	a-n	• Swab orifices (blowhole, genital and rectal) and any body cavity swabs prior to sectioning and sampling. • Any lesion or lump and adjacent healthy tissue • Liver • Kidney • Lung • Heart • Brain • Spleen, lymph nodes and adrenal glands • Digestive tract • All samples should be <1cm thick, stored in 10% buffered formalin and kept cool.	• 1cm^3 skin/blubber in 100% ethanol • 1-2 teeth in 100% ethanol /baleen (frozen) • Stomach contents in 100% ethanol or frozen • Kidney • Liver • Faeces	Skin/blubber for genetic samples can be used to confirm sex and species identification and investigate relatedness. Skin and teeth can be used for stable isotope signatures for diet and trophic analysis along with stomach contents and faeces. Teeth and skin can be used for aging. External swabs and organs samples will be used in histopathology for disease diagnosis and toxicology (contaminants and biotoxins) investigation.
24-48 hours Stage 3 Mild decomposition, Carcass intact, some bloating evident (tongue and penis protruded) and skin cracked and sloughing; possible scavenger damage; characteristic mild odour; dry eyes.	a-g, k, l	Under direction of vet or pathologist, targeted sampling	• 1cm ^{3} skin/blubber in 100% ethanol • 1-2 teeth in 100% ethanol /baleen (frozen)	Skin/blubber for genetic samples can be used to confirm sex and species identification and investigate relatedness. Skin and teeth can be used for stable isotope signatures for diet and trophic analysis and for aging.

>48hrs Stage 4 Advanced decomposition Carcass breaking up, very bloated, skin sloughing, dark and discoloured, putrid odour, likely scavenger damage, eyes sunken or missing.	a-c, e	None	• 1cm ^{3} skin/blubber in 100% ethanol • 1-2 teeth in 100% ethanol /baleen (frozen)	Skin/blubber for genetic samples can be used to confirm sex and species identification and investigate relatedness. Skin and teeth can be used for stable isotope signatures for diet and trophic analysis and for aging.
Stage 5 Mummified Skin leathery and draped over bones, carcass form and shape lost.	a-c	None	• 1cm ^{3} skin/blubber in 100% ethanol • 1-2 teeth in 100% ethanol /baleen (frozen)	Skin/blubber for genetic samples can be used to confirm sex and species identification and investigate relatedness. Skin and teeth can be used for stable isotope signatures for diet and trophic analysis and for aging.

5.4 Sampling live marine mammals

Sampling from live marine mammals should only be undertaken by veterinary staff or other suitably experienced and qualified scientists, who should determine specific sampling equipment needs and tests to be undertaken.

Swabs to screen for pathogens (e.g. bacteria and viruses) are typically taken from the blowhole or rectum. Common sites for blood extraction include the brachial vein on the foreflipper (pinnipeds), hind flipper vessels (pinnipeds) and tail fluke (sirenian and cetaceans). Unless otherwise specified, swabs and blood samples should be stored at 4˚C. Blood should be centrifuged as soon as possible (within 6 hours) to collect serum +/- plasma.

5.5 Postmortem sampling dead marine mammals

Postmortems (also known as necropsies) should only be undertaken by skilled personnel with the right equipment and requires appropriate PPE (Figure 4) (see Section 8 for Occupational Health and Safety considerations).

a) Collect full set of morphometric measurements, priority is total length and estimating or actual weight.
b) Check externally for body condition (see scoring guide and pictures at Appendix 2), wounds, and trauma (both sides of animal). Detail and describe on datasheet, noting if wounds are likely pre- or post-mortem. Take high-quality photographs of carcass and any wounds, lesions, etc., using ruler for scale and labels where appropriate.
c) Collect at least 2 unbroken teeth.
d) Roll animal onto right side if possible.
e) Take blubber depth measurements and blubber block samples if appropriate to carcass condition. Skin/blubber samples can be collected at this point.

Figure 4 Veterinarian and scientist undertaking a necropsy in appropriate PPE.

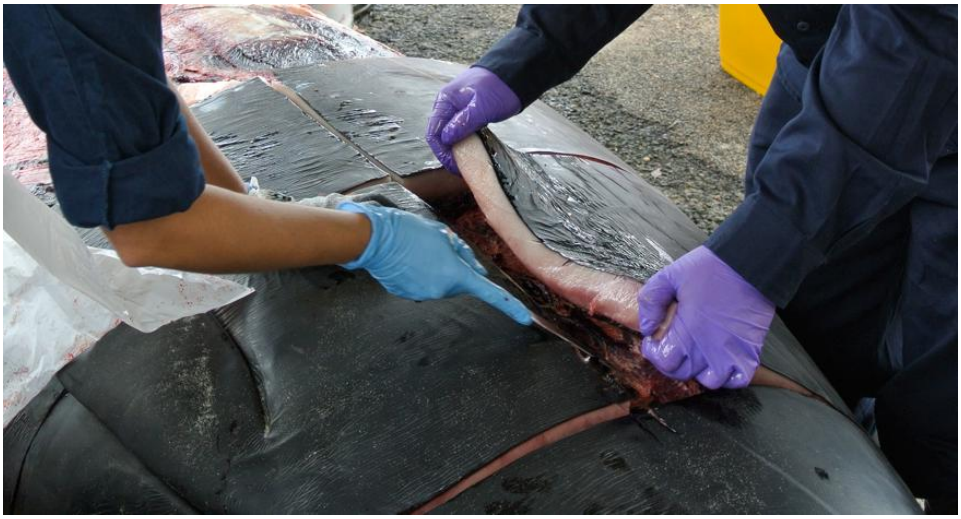

Figure 5 Removing skin and blubber to access the abdominal cavity.

f) Open mouth, thorax, and abdomen:
    i. Cut along ventral mid-line of skin from the point of the jaw to the vent (blubber depth only).
    ii. Immediately behind the head, cut from ventral mid-line to dorsal mid-line (blubber depth only).
    iii. Immediately in front of the vent, cut from ventral mid-line to dorsal midline (blubber depth only).
    iv. Cut/break connective tissue to reflect dorsally the entire section of blubber and skin (Figure 5).
    v. Using shears, cut ribs away as close to the sternum and vertebrae as possible. If no shears are available, use a sturdy knife to cut through the softer cartilaginous section of each rib.
    vi. Carefully reflect muscle from entire area to expose abdominal organs and digestive tract in situ.
g) At this stage check organs are in the correct position and for any signs of trauma prior to removing the organs. Then, as you progressively extract each organ, record any change in colour, shape, size or consistency (e.g., abnormally firm lungs) and photograph (including ruler for scale and label). Note any changes/lesion distribution patterns, presence of abnormal material such as fluid or exudates.
h) Remove lungs and heart in one piece.
    i. Cut multiple 'bread slice' sections through the lungs. The bread slicing technique is to thoroughly examine the whole organ.
    ii. Open, all four chambers of the heart and major vessels.
i) 'Bread slice' section the liver and spleen.
j) Remove kidneys and cut transverse sections (note: cetacean kidneys consist of multiple discrete functioning units, so unless the whole kidney is diseased there is unlikely to be an issue). Remove the bladder.
k) Remove stomach and intestinal tract in one piece (cable-ties or string can be used to tie off oesophagus above stomach to help retain contents; can also tie off below the pyloric

sphincter if only stomach is required): retain stomach for analysis or open in-situ and check (and collect) contents.

l) Remove head and if CT or MRI scan is intended then leave intact. If brain samples are requested use hacksaw to make full transverse cut through parietal bone to base of skull.

m) Gently shake the two sections of brain (frontal and cerebral and brainstem) from the skull. Check for haemorrhage, lumps, and changes in colour but do not cut any further sections in brain fix in formalin immediately. A large container is required if the brain is to be kept whole. Retaining some brain fresh-frozen for molecular testing and infectious disease/pathogen investigation.

n) Check for lactation (engorged and potentially leaking mammary slits) and/or presence of foetus in females, or maturity of gonads in males.

Note: organ samples should be no thicker than 1cm and be preserved in 10% neutral buffered formalin.

5.6 Labelling samples

Correct and permanent labelling of samples is **crucial** for follow-up curation and analyses. An example label is provided here:

GM_Cheynes_20230725_ID01
i.e. (Species_Location_Date_Individual)
Whereby: Species is identified by the first letter of the species and genus name e.g., for long-finned pilot whales this is GM for *Globicephala melas*
Location is written as text 'Cheynes'
Date is an eight digit number (YYYYMMDD) e.g. 25th July 2023 is 20230725

Where possible a waterproof label inside the vial is ideal, with a backup label for easy access externally on the pot or vial, noting that some pens will run with preservatives such as ethanol and therefore pencil or pre-printed waterproof labels are the most reliable. Labels should be referenced with an individual on the stranding and postmortem form. In the case of mass strandings it may be easiest to have the samples listed in a spreadsheet and referenced to a unique identifier for each stranded individual.

6 Competencies

A person who is competent has the knowledge, skills, and experiences that allow them to conduct a postmortem successfully, and appropriately manage adverse events as required. Department personnel, and other external parties covered by the department's AEC, undertaking scientific sampling require approval from the committee and will need to satisfy the competency requirements detailed in Table 2. Other groups, organisations or individuals using this SOP to guide their scientific sampling activities are encouraged to also meet these competency requirements as well as their animal welfare legislative obligations.

It should be noted that sampling design details such as intensity and scope of the project being undertaken will determine the level of competency required and Table 2 provides advice for standard scientific sampling only.

Table 2 Competency requirements for Animal Handlers of projects using sampling at stranding events.

Competency category	Competency requirement	Competency assessment
Knowledge	Broad understanding of the framework governing the use of animals in research and environmental studies in Western Australia	Training (e.g. DBCA Fauna Management Course or equivalent training). In applications, provide details on the course provider, course name and year.
	Understanding species biology and ecology	Personnel should be able to correctly identify the likely species to be encountered for the site(s) being studied, and have an understanding of the species' biology and ecology. This knowledge may be gained through sufficient field experience and consultation of field guides and other literature.
	Understanding environmental conditions	Personnel should be aware of the environmental and seasonal conditions that may be expected on the project, and understand location-specific animal welfare considerations. In applications, provide details of experience in sampling at stranding events or in captive settings that may be comparable.
Fauna survey and capture skills/experience required	Experience handling marine mammal taxa including pinnipeds, sirenians and cetaceans.	Personnel should be experienced in interpreting marine mammal behaviour, in handling and physically (or chemically) restraining as required. This experience is best obtained under supervision of more experienced personnel.

		In applications, provide details on experience relating to the expected species of pinniped, sirenians and cetaceans.
Animal handling and processing skills/experience required	Experience handling marine mammal taxa including pinnipeds, sirenians and cetaceans.	Personnel should be experienced in interpreting marine mammal behaviour, in handling and physically (or chemically) restraining as required. This experience is best obtained under supervision of more experienced personnel. In applications, provide details on experience relating to the expected species of pinniped, sirenians and cetaceans.
	Experience managing disease risk in wildlife management	Personnel should be familiar with hygiene procedures. This knowledge may be gained through sufficient field experience, laboratory protocols and consultation of literature.

In conjunction with possessing the required understanding and knowledge of scientific sampling procedures and animal welfare requirements, a guide to the experience and skill requirements for an animal handler to be considered competent to sample stranded marine mammals is as follows: (noting that some personnel with experience may still require initial supervision in unfamiliar locations or with species that they have not encountered previously):

- Total time in field: minimum of attending five single strandings or one mass stranding.
- Recency of time in field: within the last 10 years.
- Minimum 1 individual of similar species sampled of each taxa i.e. pinniped, sirenian or cetacean.

7 Approvals

In Western Australia any person using animals for scientific purposes must also be covered by a licence issued under the *Animal Welfare Act 2002*, which is administered by the Department of Primary Industries and Regional Development. Projects involving wildlife may require a licence/authorisation under the *Biodiversity Conservation Act 2016* (examples below).

- Fauna taking (scientific or other purposes) licence (Reg 25).
- Fauna taking (biological assessment) licence (Reg 27).
- Fauna taking (relocation) licence (Reg 28).
- Section 40 Ministerial Authorisation to take or disturb threatened species.

Personnel should consult the department's Wildlife Licensing Section for further guidance Contact the department's Wildlife Licensing Section for more information. It is your responsibility to ensure you comply with the requirements of all applicable legislation.

8 Occupational Health and Safety

The following departmental SOPs for wildlife survey and monitoring activities are relevant to occupational health and safety:

- SOP *Managing Disease Risk and Biosecurity in Wildlife Management*

Departmental personnel, contractors and volunteers have duties and responsibilities under the *Occupational Safety and Health Act 1984* and Occupational Safety and Health Regulations 1996 to ensure the health and safety of all involved. Fieldwork is to be undertaken in line with the department's corporate guidelines, policies and standard operating procedures, including but not limited to, risk management and job safety analyses. Further information can be found at

https://dbca.sharepoint.com/Divisions/corporate/people-services/HS/SitePages/SOPs.aspx

If department personnel or volunteers are injured, please refer to the departmental Health, Safety and Wellbeing Section's 'Reporting Hazards, Near-misses and Incidents' intranet page, which can be found at

https://dbca.sharepoint.com/Divisions/corporate/people-services/HS/SitePages/Reporting-Hazards,-Near-Misses-and-Incidents.aspx

Personal Protective Equipment (PPE) is necessary for anybody participating in sampling and postmortems at strandings. At a minimum latex glove, a N95 mask and eye protection (either safety glasses or sunglasses), closed shoes and full length clothes should be worn for any sampling. Additional disposable barriers such as coveralls and boot covers should be included for full postmortems.

Care should be taken when handling fixatives or preservatives such as formalin and ethanol and other chemicals and sharp instruments. Where formalin is used, it should be done in a well-ventilated area and direct skin contact, and inhalation should be avoided as it is both toxic and corrosive. If formalin is not available at the stranding site, samples should be collected and stored on ice and then transferred to 10% non-buffered formalin as soon as possible.

Dispose of or disinfect contaminated PPE to biosecurity standards. Handle and dispose of instruments, surfaces, and biological waste in line with local regulations, and report suspected zoonotic cases. Noting there is a legal obligation to report notifiable diseases to authorities., one of particular concern is highly pathogenic avian influenza (HPAI). HPAI is not currently present in Australia but has been detected in marine mammals overseas and should be considered in cases presenting with respiratory distress, neurological abnormalities (e.g. seizures, disorientation), gastrointestinal illness, or sudden death. For more information see https://wildlifehealthaustralia.com.au/Resource-Centre/H5-bird-flu.

9 Further Reading

The following SOPs have been mentioned in this advice, and it is recommended that they are consulted when proposing to sample stranded marine mammals:

- Department SOP *Euthanasia of Small Stranded Cetaceans*
- Department SOP *First Aid for Animals*
- Department SOP *Managing Disease Risk and Biosecurity in Wildlife Management*
- Department SOP *Euthanasia of Animals Under Field Conditions*

For further advice refer also to:

National Health and Medical Research Council (2013) *Australian code for the care and use of animals for scientific purposes*, 8th edition. Canberra: National Health and Medical Research Council.

Hampton, J.O., Mawson, P.R., Coughran, D.K. and Vitali, S.D. (2014) Validation of the use of firearms for euthanising stranded cetaceans. Journal of Cetacean Research and Management (1) 117-123

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DCCEEW 2024, The National Guidelines for Euthanasia of Stranded Large Whales, Department of Climate Change, Energy, the Environment and Water, Canberra. CC BY 4.0. Available at https://www.dcceew.gov.au/environment/epbc/publications/national-guidelines-euthanasia-stranded-large-whales

11 Glossary of Terms

Animal handler: A person listed on an application to the department's Animal Ethics Committee who will be responsible for handling animals during the project.

Cetacean: Marine mammals commonly known as whales, dolphins and porpoises.

Pinniped: Marine mammals commonly known as seals or sea lions.

Scientific sampling: the systematic collection of biological samples from marine mammals that have stranded on land or in water. This process aims to gather valuable data about the species, their health, and the environmental conditions surrounding their stranding.

Sirenian: Marine mammals commonly known as dugongs or manatees.

Appendix 1: Marine Mammal Incident Report Form

Department of Biodiversity, Conservation and Attractions

Marine mammal incident report - data and sample collection

Following incident response, relevant info is to be entered into Marine Mammal Incident Database within the WAStD database and the form uploaded or emailed to: Marine Science Program (Senior Marine Scientist – Marine Fauna email: holly.raudino@dbca.wa.gov.au).

NOTIFICATIONS: ◻ Duty Wildlife Officer 9219 9837 ◻ Marine Science Program ◻ Regional Manager ◻ DBCA media 9219 999 ◻ DPIRD Principal Research Scientist (only for large whale entanglement)

Officer Name/Phone: _____ **Date:** _____ **Time:** _____

ANIMAL IDENTIFICATION: Log #/other ID _____

Species_____

LOCATION Region/District: _____

GPS: _____ S _____ W Body of water/Beach/BEN number:_____

Decimal degrees: _____ _____

Other location details: _____

INCIDENT DETAILS

◻ Single animal ◻ cow/calf pair ◻ mass stranding (2 or more animals which are not a maternal pair)

Type of incident (tick as many as apply):

◻ stranding ◻ entanglement (tethered) ◻ entanglement (not tethered) ◻ entrapment ◻ illness / disease

◻ injury human– boat strike ◻ injury – previous entanglement ◻ injury – predation ◻ orphaned juvenile

◻ other

(give details) _____

SITUATION:

Animal access (challenges, landmarks etc.): _____

Environmental conditions (seas, swell, tides; beach condition): _____

Healthy marine mammals in attendance? ◻ YES ◻ NO If Yes, Number: _____Species

Onlookers/bystanders in attendance ◻ YES ◻ NO Media in attendance ◻ YES ◻ NO

Situation hazardous ◻ to animal/s ◻ to public (details) _____

For strandings: surroundings checked for other stranded animals? ◻ YES ◻ on foot ◻ by air distance/area _____ checked _____

NO If no, give details of areas to be checked _____

Likely scale of incident ◻ Level 1 ◻ Level 2 ◻ Level 3 ◻ Level 4 (dead)

INITIAL OBSERVATION

Location and behaviour when first observed (for multiple animals, tick all that apply): ◻ beach/land ◻ floating ◻ swimming

◻ floating - symmetrical ◻ floating - asymmetrical ◻ circling ◻ other unusual behaviours (describe)

_____

CONDITION AT INITIAL OBSERVATION* ***Single animal (tick one)***

◻ 1. Alive ◻ 2. Freshly dead ◻ 3. Mod. decomposition ◻ 4. Advanced decomposition ◻ 5. Mummified/skeletal ◻ 6. Unknown

Multiple animals
Number : alive _____ dead _____ ◻ actual ◻ estimated;
No. of live animals: swimming _____ floating _____ on beach _____

OUTCOME:
Live animal (tick as many as apply and indicate species and numbers of individuals for each):
◻ swam away unassisted ___ ◻ left at site ___ ◻ immediate release at site ___ relocated ___ ◻ disentangled ___ ◻unsuccessful disentanglement attempt ◻ unable to be relocated ◻ monitored
◻ died ___ ◻ euthanased ___
Carcass: ◻ left at site ◻ buried ◻ relocated ◻ towed ◻ sunk ◻ landfill ◻ post mortem ◻ museum ◻ samples/data ◻ photos

IDENTIFICATION

Species *_____

Sex ☐ M ☐ F ☐ undetermined Age ☐ adult ☐ subadult ☐ juvenile ☐ calf ☐ newborn ☐ undetermined

(circle) Alive when sampled / Found dead /euthanized/ died Date of death (dd/mm/yy) _____ ☐ actual ☐ est.

Frozen/thawed ☐ Yes ☐ No

Condition of carcase (circle) Stage 1= alive; 2 = fresh; 3= mild decomposition 4= advanced decomposition 5= mummified/skeletal

Date necropsied/sampled _____ Examiner/affiliation _____

Necropsy description (tick all that apply) ☐ morphometrics ☐ external exam ☐ internal exam

EXTERNAL EXAMINATION

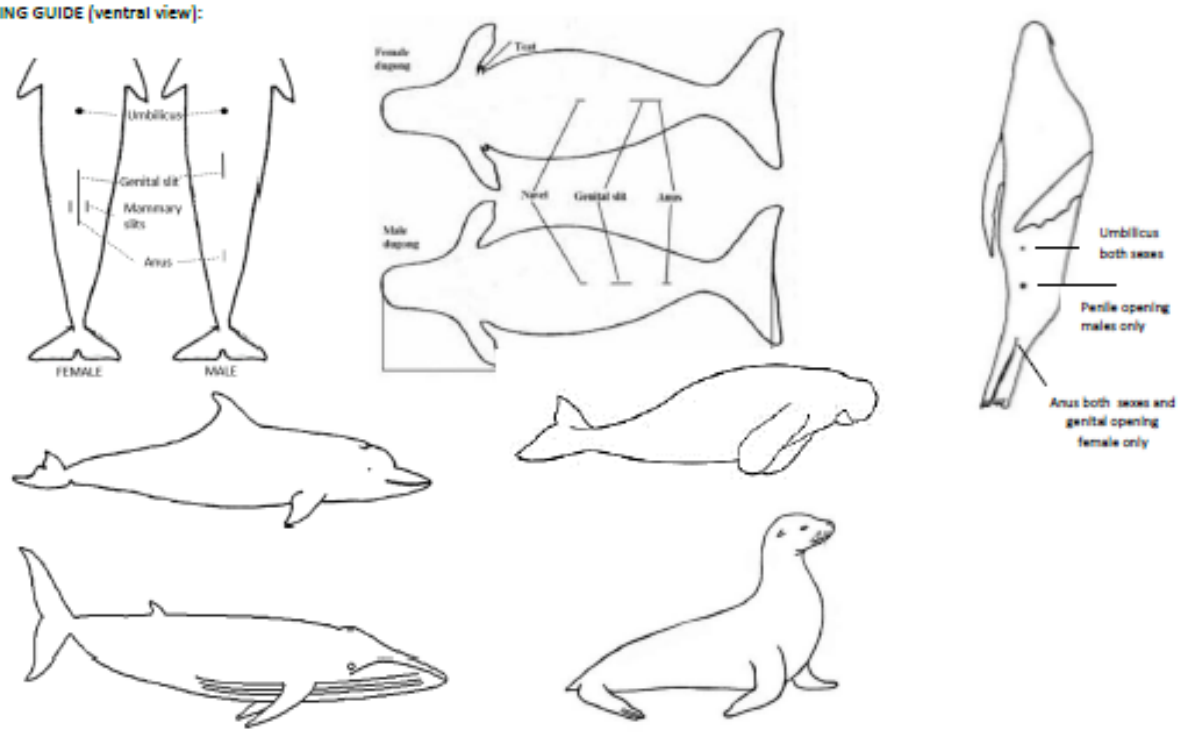
Body weight _____ kg ☐ actual ☐ est. Body condition score: emaciated 1 2 3 4 5 obese

ANATOMIC LOCATION CODES: Left (L) Right (R); Head (Hd) Neck (N) Eye (E) Ear (Ea) Dorsum (D) Ventrum (V) Blowhole (B) Upper jaw (UJ) Lower jaw (LJ) Dorsal fin (DF) Pectoral fin (PF) Tail (T) Tail fluke (TF) Forelog (F) Hindleg (H) Digit (D1-5) Phalanx (P1-5) pectoral girdle (Pec) pelvis (Pv)

External pathology (tick if present; use diagrams and add comments/corresponding photo numbers as required):

PATHOLOGY	*ANATOMIC CODE/S*	*COMMENTS*	*PATHOLOGY*	*ANATOMIC CODE/S*	*COMMENTS*
☐ Post mortem damage			☐ Oil/tar		
☐ Open wounds			☐ Pressure injuries (eg from entanglement; prolonged stranding		
☐ Scars,other healed marks			☐ Sunburn		
☐ Fractures			☐ Other skin disease		
☐ Epibiota			☐ Crushing/bruising		

SEXING GUIDE (ventral view):

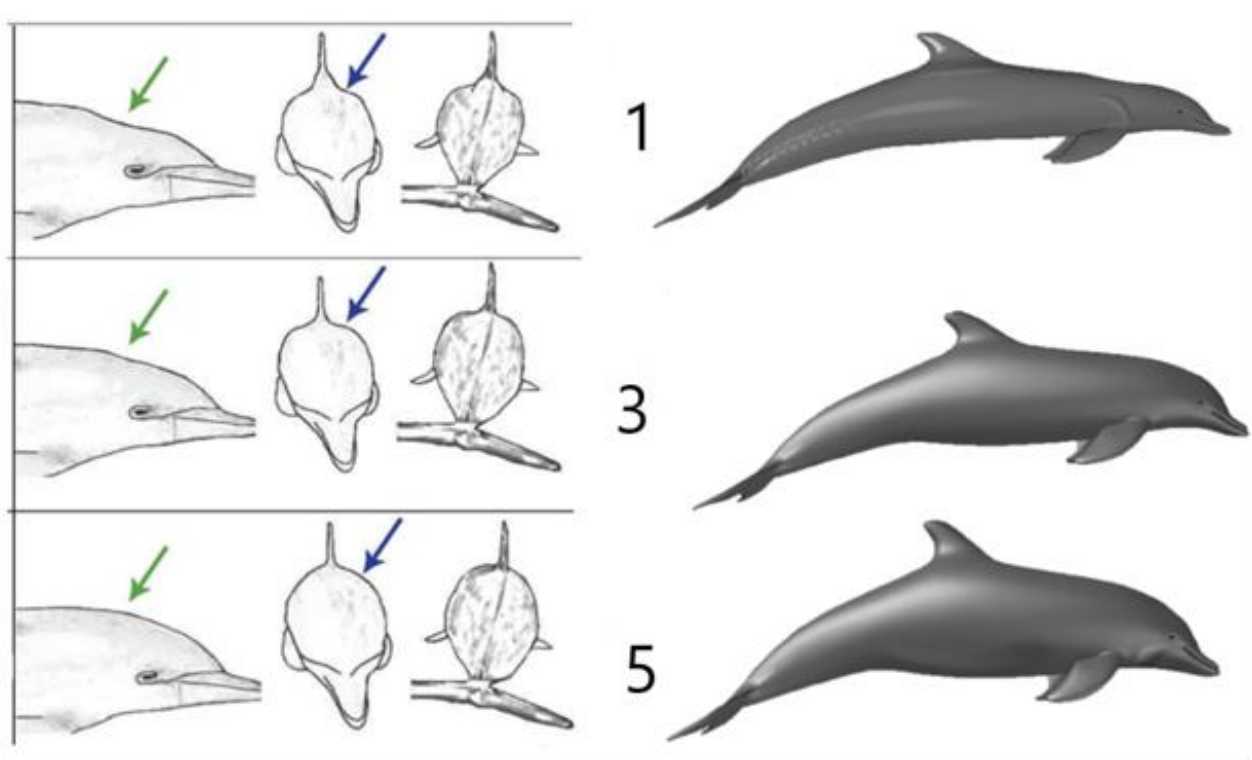


WOUNDS, INJURIES, IDENTIFYING FEATURES (lateral view)

Appendix 2: Body Condition Scoring (BCS)

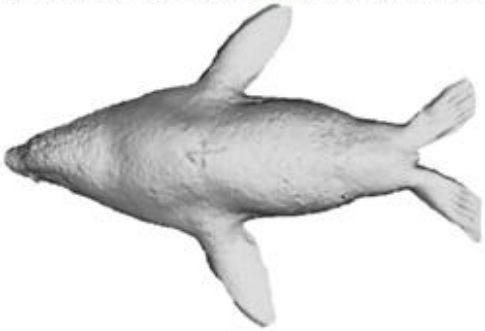
BCS is assessed on a scale of 1 to 5 where 1 is emaciated, 3 is average and 5 is fat. Cetaceans (Clegg et al 2015 and Joblon et al 2014) and pinnipeds (Hodgson et al. 2020) have different features for determining BCS as outlined here.

Examine the area behind the skull, the shoulders and the flukes in both lateral (side-on) and dorsal views. The BCS criteria shown here are based on captive dolphins; it is highly unlikely that a dolphin with BCS of 5 will be encountered in the wild.



LEFT: *BCS 1-2. Note "peanut head" and hollow area under dorsal fin. RIGHT: BCS 3 (Photos: Sally Kirby***)*

Otariid body condition scoring (adapted from Hodgson et al 2020)



BCS 3-4

BCS 1-2

Phocid body condition scoring (Photos: Shona Lorigan)

BCS 4

BCS 2

Appendix 3: Scientific Sampling Equipment Suggested for Marine Mammal Strandings

Equipment	Quantity	✓		Quantity	✓
Heavy duty rubber gloves	10 pairs		Sharpening steel	1	
Latex lab gloves, multiple sizes S, M, L	Box of each		Pliers	1	
Disposable coveralls (various sizes)	1 box		Hammer	1	
Safety Glasses			Plastic tray	2	
Genetic Eppendorf Tubes	5		Cutting board	1	
Stethoscope	1		scalpel handle #3 (#10 blade)	1	
Scourer	2		scalpel handle #4 (#22 blade)	1	
Scrubbing brush	1		100% ethanol or 70% if unavailable	1L	
Roll of plastic garbage bags	2		Gauze swabs in alcohol	1	
Packet of Chux cloths	1		Sterile plastic and glass containers	various sizes	
Paper towel			100 Eppendorf tubes to store biopsy samples	1 box	
Disentanglement knife	1		Roll of aluminium foil	1	
Dissecting knives	10		Various sized ziplock bags	2 boxes	
Hand saw	1		Syringes various sizes (5, 10, 20, 50ml) disposable		
Scalpel blade #22 x 100	1		Needles disposable: 25G, 23G, 21G, 18G, 16G		

Scalpel blade #10 x 100	1		Disposable pasteur pipettes		
Gauze swabs 7.5x7.5cm x 100	2		Pruning shears	1	
Foam eskys for samples	1x L,1 x S		Post mortem examination forms		
Ice packs	20		Biopsy punch (5mm size)	100	
String (for attaching labels)	1		Spaghetti Tags	100	
sharps disposal container	1		10mm Microchips and reader	100	
Vernier calipers	1				
Tape measure (small and large)	2				