2022

Western Australia Oiled Wildlife Response Manual

A companion document to the

WA Oiled Wildlife Response Plan for Maritime Environmental Emergencies 2021

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

Department of **Transport**

AMOSC Australian Marine Oil Spill Centre Pty Ltd

i. Amendments Record

Rev	Date	Description	Prepared By	Reviewed By	Approved by
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2					
3					
4					

This Manual will be reviewed and updated by Department of Biodiversity, Conservation and Attractions (DBCA), as needed, following a significant incident, changes of best practice, or State Hazard Plan updates.

ii. Acknowledgments

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We acknowledge the traditional custodians throughout Western Australia and their continuing connection to the land, waters and community. We pay our respects to all members of the Aboriginal communities and their cultures; and to Elders past, present and emerging.

iii. Table of Contents

iv. Acronyms

AMSA	Australian Maritime Safety Authority
AMOSC	Australian Marine Oil Spill Centre
DBCA	The Department of Biodiversity, Conservation and Attractions
DoT	Department of Transport (WA)
IAP	Incident Action Plan
IPIECA	International Petroleum Industry Environmental Conservation Association
IMT	Incident Management Team
MOP	Marine Oil Pollution
NOAA	National Oceanic and Atmospheric Administration
OWCN	Oiled Wildlife Care Network
OWR	Oiled Wildlife Response
PCF	Primary Care Facility
PPE	Personal Protective Equipment
RAT	Rapid Assessment Team
SCATT	Shoreline Clean-up Assessment Techniques Team
SOP	Standard Operating Procedure
WAOWRP	The Western Australian Oiled Wildlife Response Plan

v. Introduction

The WA Oiled Wildlife Response Manual ("the Manual") supports the WA Oiled Wildlife Response Plan (WAOWRP) and is to be used in conjunction with the plan. The purpose of the Manual is to standardise the operating procedures, protocols and processes for the wildlife response to a marine oil pollution (MOP) event in WA, and to create alignment between the wildlife response processes and the overall incident response.

"Oiled Wildlife Response" (OWR) encompasses the combination of activities that minimise the impacts of an oil spill on wildlife by a) prevention of oiling and b) mitigation of effects when oiling has taken place. The success of an OWR goes beyond the count of rehabilitated and released animals, and includes consideration of factors such as:

- the ability to protect animals from oiling;
- the capacity to minimise suffering of wildlife and optimise welfare;
- the ability to mobilise a response quickly and to perform basic activities promptly;
- the effectiveness of integration of OWR into the overall response;
- the ability to harness local resources, capacity and communities into ongoing response efforts;
- the ability to respond while preserving the safety of responders;
- the capacity to transport affected animals to resource hubs for more effective treatment and provide the best achievable care;
- the ability to derive learning from response events which drives improved future responses and improved understanding of the impact of oil on wildlife.

The principles and processes of OWR as laid out in the Manual are aligned with the IPIECA *Key Principles for Oiled Wildlife Response* (2017) and *Wildlife Response Preparedness* (2014). They draw on the protocols and expertise of many agencies undertaking oiled wildlife response globally, including OWCN, Wildbase, Sea Alarm and NOAA, and represent current best practice in OWR

The Manual is divided into four sections:

1. *Procedures*: The WAOWRP divides the operations of OWR into eight phases of response, each supported by a standard operating procedure in the Manual. The procedures are the primary source of operational direction for responders under the WAOWRP.
2. *Guidelines*: these provide information on over-arching principles such as risk assessment, biosecurity, wildlife management strategies, animal welfare and facility design tailored to OWR. Guidelines specifically support the WAOWRP but are adapted from internationally recognised general principles and protocols.
3. *Template forms and labels*: these are the forms and labels specifically designed to support the procedures in this Manual. They are tailored to the recording requirements and formatting of DBCA as the lead agency in OWR in WA and cover all aspects of OWR recording and data entry.
4. *Appendices*: charts of information, derived from reputable OWR and wildlife management sources, intended to provide quick reference information on response aspects such as nutrition, drug doses, animal weights and bandaging techniques. These have been adapted to reflect WA species and product availability.

The bibliography details all internal and external references and sources of information used in the compilation of this document.

WA OWR MANUAL

SECTION 1: PROCEDURES

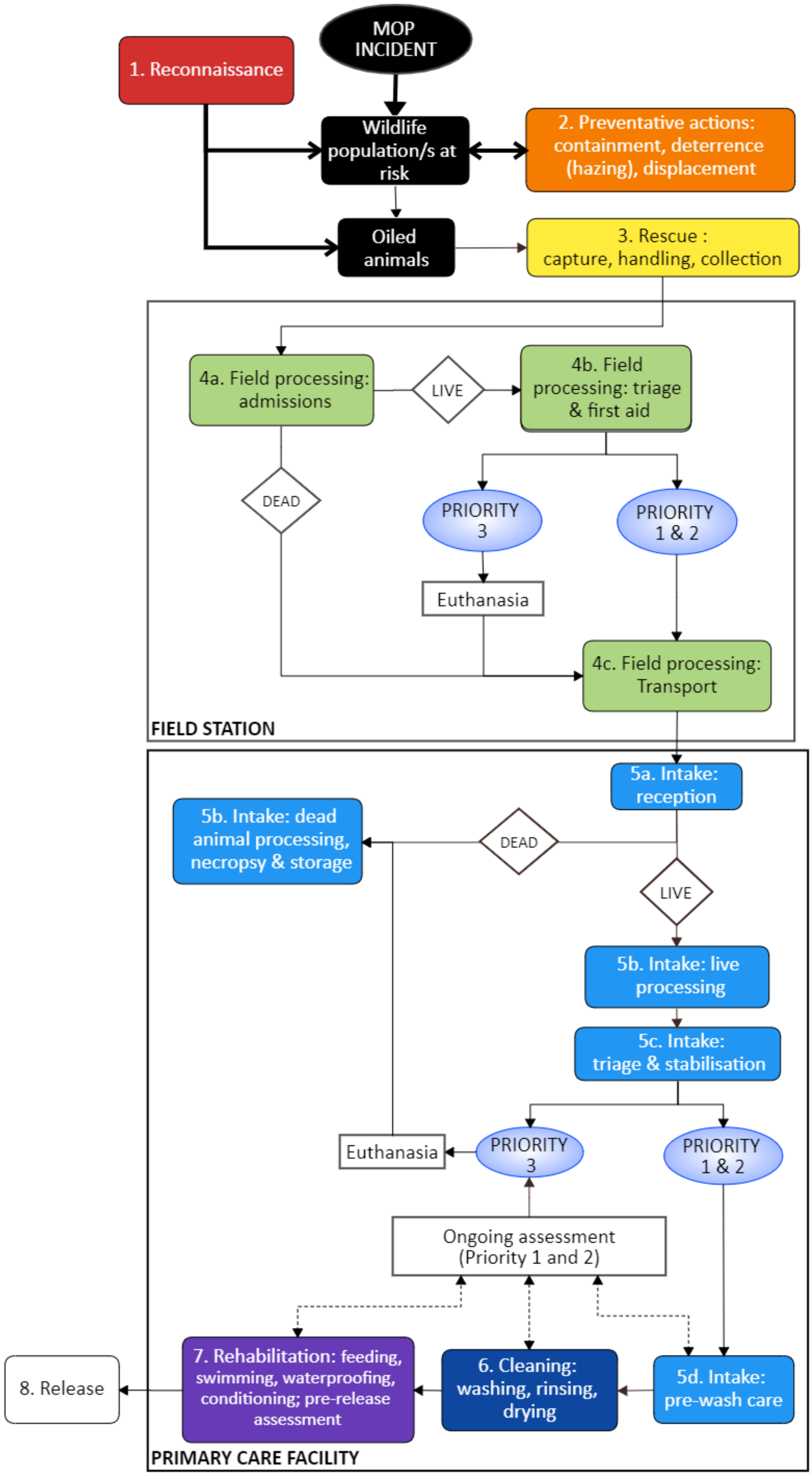


Figure P-0-1: Movement of wildlife through the phases of the OWR

P1 OWR PROCEDURE: PHASE 1 WILDLIFE RECONNAISSANCE

Responsible personnel: Wildlife Unit team members in RATs, SCATTs and other multidisciplinary survey teams

Recording requirements:

Forms: F1-1 Wildlife reconnaissance – observation record

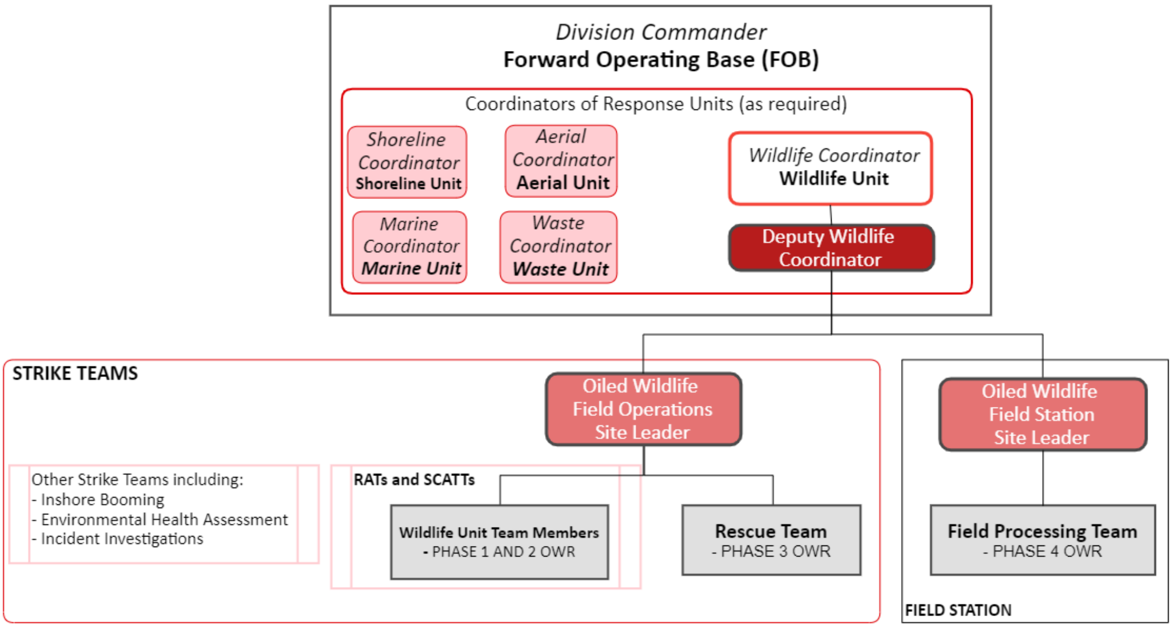


Figure P-1- 1 Deployment of field teams in OWR

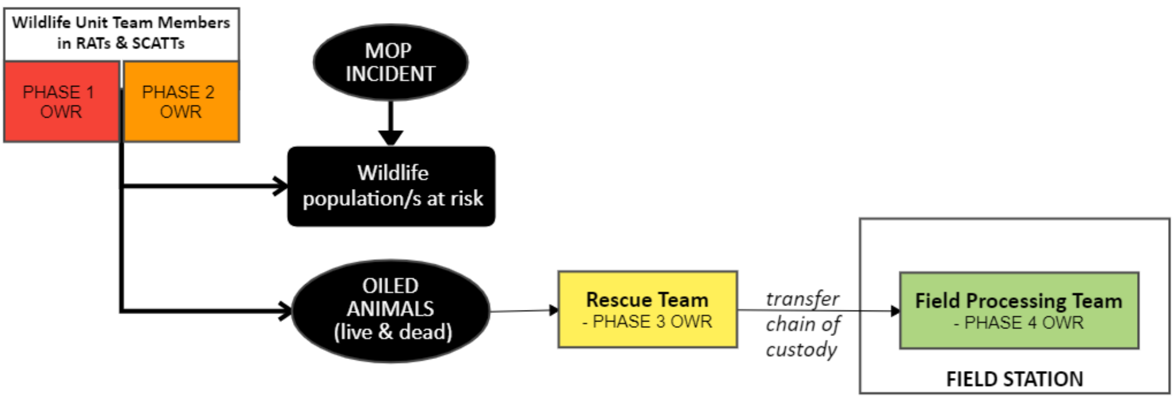


Figure P-1- 2 Work flow – Field phases of OWR

1. Purpose and Scope

If wildlife populations are put at risk through a marine oil pollution (MOP) event, a process to identify current and potential wildlife impacts will be undertaken as part of the response.

This procedure provides guidance for participation of Wildlife Unit personnel in wildlife reconnaissance in the event of an oil spill. The methodologies will depend on the situation, spill dynamics, ecosystem properties and species affected. G-3 *OWR strategies by fauna group* provides additional guidelines for reconnaissance strategies based on taxonomic group and life stage.

2. Human Safety

All Wildlife Unit personnel should be familiar with G-1 *Workplace Health and Safety*, which provides information on job safety analysis and incident reporting processes, and a risk assessment and mitigation matrix for each phase of OWR activity.

The following hazards have been assessed as “high risk” for personnel undertaking wildlife reconnaissance activities (see G-1 *Workplace Health and Safety* for the full risk assessment):

- exposure to oil pollutants and contaminants
- environmental exposure (dehydration, hypothermia, hyperthermia, sunburn, heat stroke)
- physical injury – slips, trips and falls
- physical injury – vehicle strike or mishap (including drowning).

3. Personnel

Wildlife reconnaissance should be performed by people with specific expertise in the local conditions and in the recognition and identification of local fauna and flora, to ensure that reliable information is fed back to the IMT.

Reconnaissance (also known as assessment or monitoring) activities commence early in the response and may already be under way by the time the WAOWRP is activated. However, it will be important to bring the expertise of the Wildlife Unit to this process to provide expert interpretation of the scope and scale of current and potential wildlife involvement.

Reconnaissance activities will be informed by the activities of the Planning section of the IMT, who will plot wildlife communities in the local area that may be affected, based on information from databases and real time sources.

Wildlife Unit personnel undertaking reconnaissance are likely to be deployed into Rapid Assessment Teams (RATs) and Shoreline Cleanup and Assessment Technique Teams (SCATTs) to undertake their activities (Figure P-1-1).

4. Equipment and Facilities

See Appendix A of the WA Oiled Wildlife Response Plan for equipment checklists. The Field Station is the likely base for the equipment and resources of wildlife reconnaissance.

5. Reconnaissance Activities

Wildlife Unit reconnaissance personnel:

- determine the extent of the wildlife impact: number of individuals affected, identify affected species; identify geographic extent and ecological impacts;
- record animals at risk (i.e. unoiled animals that may become oiled);
- collect data for subsequent phases of OWR such as preventative actions and rescue.

To ensure a systematic approach, the affected shoreline and intertidal habitat is divided into *sectors*, with a series of *segments* within each sector. Depending on the situation, Wildlife Unit personnel may be mobilised to participate in sector or segment reconnaissance via air, vessel or land, as required by the scale of the area and other logistic considerations.

It will not be possible to detect the presence or degree of oiling of animals by remote surveying; most shoreline reconnaissance will be undertaken by Wildlife Unit personnel on foot or land vehicle within RATs and SCATTs. SCATTs undertake a sector by sector assessment of polluted shoreline, to systematically characterise the nature of any oil pollution, including wildlife impacts. SCATTs will generally contain at least one Wildlife Unit team member to undertake wildlife reconnaissance.

Wildlife Unit reconnaissance personnel evaluate habitat impacts, locate and identify oiled and non-oiled fauna, and identify at-risk habitat such as nests, roost sites and gathering areas. Observations are documented using F1-1 *Wildlife reconnaissance observation record.* When assessing the area, consider the species and groupings you would expect to see, and note absences as well as presence.

Reconnaissance information is conveyed to the OW Field Operations Site Leader and will inform the deployment of teams to undertake preventative actions or rescues (Phase 2 and 3) as required.

Any disturbance of fauna makes reconnaissance difficult. Searches should minimise disturbance wherever possible. Responders should keep a low profile, observe animal behaviour and adjust their actions accordingly.

Guidelines on methodologies for monitoring and evaluating nesting sea turtles are available in the following texts:

Shigenaka et al. 2021. *Oil and Sea Turtles: Biology, Planning and Response.* https://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/resources/oil-and-sea-turtles.html

Stacy et al 2019. *NOAA Guidelines for Oil Spill Response and Natural Resource Damage Assessment: Sea Turtles.* https://www.fisheries.noaa.gov/resource/document/guidelines-oil-spill-response-and-natural-resource-damage-assessment-sea-turtles

P2 OWR PROCEDURE: PHASE 2 PREVENTATIVE ACTIONS

Responsible personnel: Wildlife Unit team members in SCATTs and RATs

Recording requirements:

Forms: F2-1 Oiled wildlife preventative actions observation record

Teams and work flow: see Figures in P-1 Phase 1 Reconnaissance

1. Purpose and Scope

Where wildlife is at risk of becoming impacted by oil, actions to prevent further oiling will be explored. Preventative actions are all activities which prevent unoiled wildlife from getting oiled.

The primary oil spill response objectives of containment, clean-up and preventing further discharges are critical preventative actions for the protection of wildlife (Figure P-1-2). These occur in addition to the Phase 2 OWR, which is specifically designed to prevent wildlife impacts.

This procedure describes the implementation and monitoring of Phase 2 activities. Specific methodologies are not described in detail but G-3 *OWR strategies by fauna group* provides additional guidelines based on taxonomic group and life stage.

2. Human Safety

All Wildlife Unit personnel should be familiar with G-1 *Workplace Health and Safety*, which provides information on job safety analysis and incident reporting processes, and a risk assessment and mitigation matrix for each phase of OWR activity.

The following hazards have been assessed as "high risk" for personnel undertaking wildlife preventative action activities (see G-1 *Workplace Health and Safety* for the full risk assessment):

- exposure to oil pollutants and contaminants
- environmental exposure (dehydration, hypothermia, hyperthermia, sunburn, heat stroke)
- physical injury – slips, trips and falls
- physical injury – vehicle strike or mishap (including drowning).

3. Equipment and Facilities

See Appendix A of the WA Oiled Wildlife Response Plan for equipment checklists. AMOSC has Fauna Hazing and Exclusion kits which may be deployed as part of the OWR – see the WAOWRP for details. The Field Station is the likely base for the equipment and resources for Phase 2.

4. Preventative Action team activities

4.1 Planning

Deterrence and displacement activities carry inherent welfare risks for animals, including the risk of unintended movement of animals into areas of higher risk. The decision to undertake preventative actions must be taken with extreme care, weighing the risks of oiling against the risks of injury, disease or death arising from the activity. Preventative activities should only be undertaken after a complete plan is developed and incorporated into the Incident Action Plan (IAP) for implementation.

The Wildlife Coordinator will recommend the incorporation of preventative actions into the IAP based on a range of considerations, including:

- human and animal safety, including environmental conditions
- location and/or the extent of the spill
- availability of alternative areas for fauna to be hazed or relocated to
- the species which are present or likely to be at risk
- life history of fauna at risk (e.g., breeding, nesting, presence of juveniles, migratory species)
- availability of relevant expertise, equipment and knowledge
- availability of validated techniques for the species at risk

IMPORTANT NOTE: Preventative actions involving wildlife constitute fauna "disturbance" under the *Biodiversity Conservation Act* 2016 and requires authorisation through DBCA unless undertaken by licensed personnel. No action specifically targeted at wildlife should occur without this authority.

4.2 Deterrence ("Hazing")

Hazing is the process of discouraging animals from visiting oiled areas, or encouraging them to move into unoiled, low risk areas. Commonly used methods include use of vehicles (air, water and land), noise makers (e.g. predator recordings, cracker shells) and visual deterrents (e.g. predator effigies).

It is essential to continually monitor and review hazing activities over time, as the cost-benefit of the activity may change as animals become habituated to the activity, change their congregation patterns, or demonstrate undesirable or adverse behaviours because of the activity. Observations should be documented using F2-1 *Oiled wildlife preventative actions observation record.*

Further information on hazing techniques can be found in G-3 *OWR strategies by fauna group* and within the references below:

- IPIECA 2017 *Key principles for the protection, care & rehabilitation of oiled wildlife*
https://www.ipieca.org/resources/awareness-briefing/key-principles-for-the-protection-care-and-rehabilitation-of-oiled-wildlife/
- Stacy et al 2019 *Guidelines for Oil Spill Response and Natural Resource Damage Assessment: Sea Turtles.*
https://www.fisheries.noaa.gov/resource/document/guidelines-oil-spill-response-and-natural-resource-damage-assessment-sea-turtles
- Ziccardi et al 2015 *Pinniped and Cetacean Oil Response Guidelines*
https://www.fisheries.noaa.gov/resource/document/pinniped-and-cetacean-oil-spill-response-guidelines

4.3 Pre-emptive capture

Pre-emptive capture involves the physical removal of at-risk wildlife from the spill environment. Animals are either held in captivity until the risk of oiling has passed or are relocated to an alternative habitat where no risk exists, far enough away from the spill that species with site fidelity will only return after the risk has been resolved.

Pre-emptive capture requires a safe means of capturing a significant proportion of wildlife at risk, which can be challenging for healthy wildlife. There must also be capacity to care for the animals in captivity, and a workable plan for re-release when risk has been eliminated. This approach is resource-intensive and will generally be reserved for species of high conservation significance.

Ongoing observation of the displaced environment may be required to evaluate the impact of displacement on remaining individuals, or to determine when the risk is past, so animals can be reintroduced. Capture, handling, transport, and post-capture care are addressed in other procedures in this Manual.

P3 OWR PROCEDURE: PHASE 3 WILDLIFE RESCUE

Responsible personnel:		Rescue team
Recording requirements:		
Forms:	F3-1	Oiled wildlife rescue – collection record
Labels:	L3-1	Oiled wildlife rescue - collection tag
Teams and work flow:		See Figure P-1-2 in P-1 Reconnaissance

1. Purpose and Scope

This procedure provides guidance for the humane, safe, rapid and effective rescue of oiled wildlife, both living and dead, in the event of an oil spill.

2. Human Safety

All Wildlife Unit personnel should be familiar with G-1 *Workplace Health and Safety*, which provides information on job safety analysis and incident reporting processes, and a risk assessment and mitigation matrix for each phase of OWR activity.

The following hazards have been assessed as “high risk” for personnel undertaking wildlife rescue:

- exposure to oil pollutants and contaminants
- environmental exposure (dehydration, hypothermia, hyperthermia, sunburn, heat stroke)
- stress, fatigue and burnout
- physical injury – slips, trips and falls
- physical injury – vehicle strike or mishap (including drowning)
- physical injury – animal bites, scratches and stab wounds
- physical injury – dangerous animals

See G-1 *Workplace Health and Safety* for the full risk assessment of wildlife rescue activities.

3. Equipment and Facilities

See Appendix A of the WA Oiled Wildlife Response Plan for equipment checklists. The Field Station is the likely base for the equipment and resources for Phase 3.

4. Rescue team activities

4.1 Capture planning and triage

All staff involved in the capture and handling of wildlife should have relevant experience, particularly for large or dangerous animals such as sea lions and adult sea turtles. Unauthorised personnel should be instructed not to disturb or attempt to capture wildlife before the rescue team arrives, as disturbance could hamper successful attempts by more skilled operators.

IMPORTANT NOTE: Any rescue activity involving wildlife in WA constitutes “taking” of fauna under the *Biodiversity Conservation Act* 2016 requires authorisation through DBCA unless undertaken by licensed personnel. No action specifically targeted at wildlife should occur without this authority.

A live animal **capture plan** should be developed to enable safe and rapid retrieval of the animals at risk. The plan should outline capture technique, personnel and equipment requirements, and strategies for minimising disturbance of non-oiled animals and avoiding sensitive areas. G-3 *OWR* *strategies by fauna group* provides pertinent information on rescue strategies for the fauna groups likely to be encountered. Typically, rescue personnel should work in teams of two at a minimum.

Rescue is not always the best welfare decision for animals which are oiled or at risk of oiling, and the capture plan should also include a process for assessing the necessity of intervention. The potential benefits of capture of oil-affected wildlife must clearly outweigh potential negative consequences of captive management before the capture effort is initiated. Intervention guidance flow charts (Fig P-3-1 to P-3-3) may assist in the evaluation process.

4.2 Capture methodology

Small animals which are less mobile may only require towels and gloves for safe capture, whereas larger, more mobile or aggressive animals may require the use of nets (hand nets, skimmer nets, noose poles, pinniped restraint bags) and trapping devices (e.g. Elliot traps, squeeze cages and trapping bags). Some guidance to methodology is included in G-3 *OWR strategies by fauna group*, but expert advice should be sought at the time to determine the techniques most appropriate to the species, terrain and available equipment. The capture technique should prioritise the welfare of the animal and preserve the safety of the handler. For further information, see the following references:

All species:
DBCA SOPs - *Animal Handling and Restraint using Soft Containment; Hand Capture of Wildlife*; *Hand Restraint of Wildlife*

Birds:

NSW DPI 2014. *First Responders Resource Guide for Seabird Emergencies*
https://www.dpi.nsw.gov.au/climate-and-emergencies/emergency/marine-pollution

Marine mammals:

- Geraci and Lounsbury 1993. *Marine Mammals Ashore: a field guide for strandings* (1st ed).
https://www.whales.org.au/strandings/marine_mammals_ashore.pdf
- Ziccardi et al 2015 *Pinniped and Cetacean Oil Response Guidelines*
https://www.fisheries.noaa.gov/resource/document/pinniped-and-cetacean-oil-spill-response-guidelines

Sea turtles:

- Stacy et al 2019 *Guidelines for Oil Spill Response and Natural Resource Damage Assessment: Sea Turtles.* https://www.fisheries.noaa.gov/resource/document/guidelines-oil-spill-response-and-natural-resource-damage-assessment-sea-turtles

4.3 Collection and submission

Oiled animals, both living and dead, are an important source of petrochemical evidence. It is important to avoid cross-contamination of oil from one individual to another by not re-using contaminated equipment, holding containers or PPE between animals. Where possible, also avoid animals contacting plastic products (gloves, containers, plastic bags etc), until oil sample evidence has been collected. Personnel involved in rescue should always use nitrile gloves for personal safety, but where possible, avoid contact of the gloves with oiled animals by using towels, calico bags etc. as a barrier for handling and holding animals. Rescue teams should carry dead animal “grab kits” of ziplock bags containing aluminium foil to assist in wrapping bodies in the field to prevent contamination. See P-4, P-5i and P5-ii for procedures relating to evidence handling.

Each individual should be presented to the field station in an individual container, labelled with a completed collection tag (*L3-1 Oiled wildlife rescue – collection tag*). Live animals may be confined temporarily in cloth or hessian bags but should be transferred as soon as possible to more appropriate containers (for most birds, this will consist of a box with ventilation holes and a towel or netted flooring). Avoid containing dead animals in plastic bags unless the body has been wrapped properly in foil first (see P-4 Section 4.5).

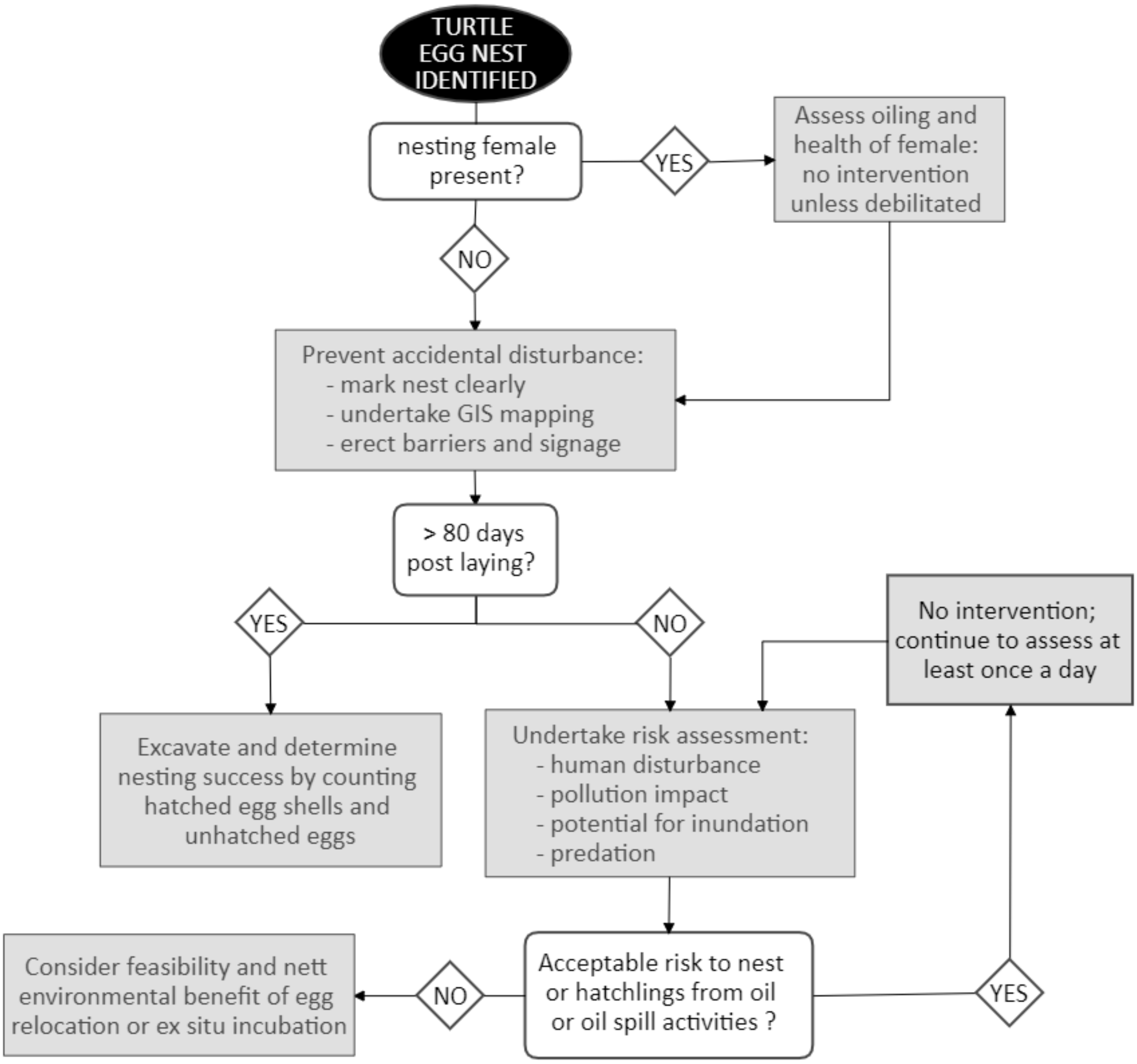


Figure P-3-1 Intervention flow chart for turtle nests and nesting females during an oil spill.

Note: Excavation and relocation of sea turtle eggs is a measure of last resort and is only undertaken when in-situ protection will not effectively reduce the risk to emerging hatchlings. See Shiganaka et al (2021) for further details. Movement of eggs between about 3 hours and 3 weeks after oviposition results in substantial mortality due to rupture of embryonic membranes (Harry and Limpus 1989).

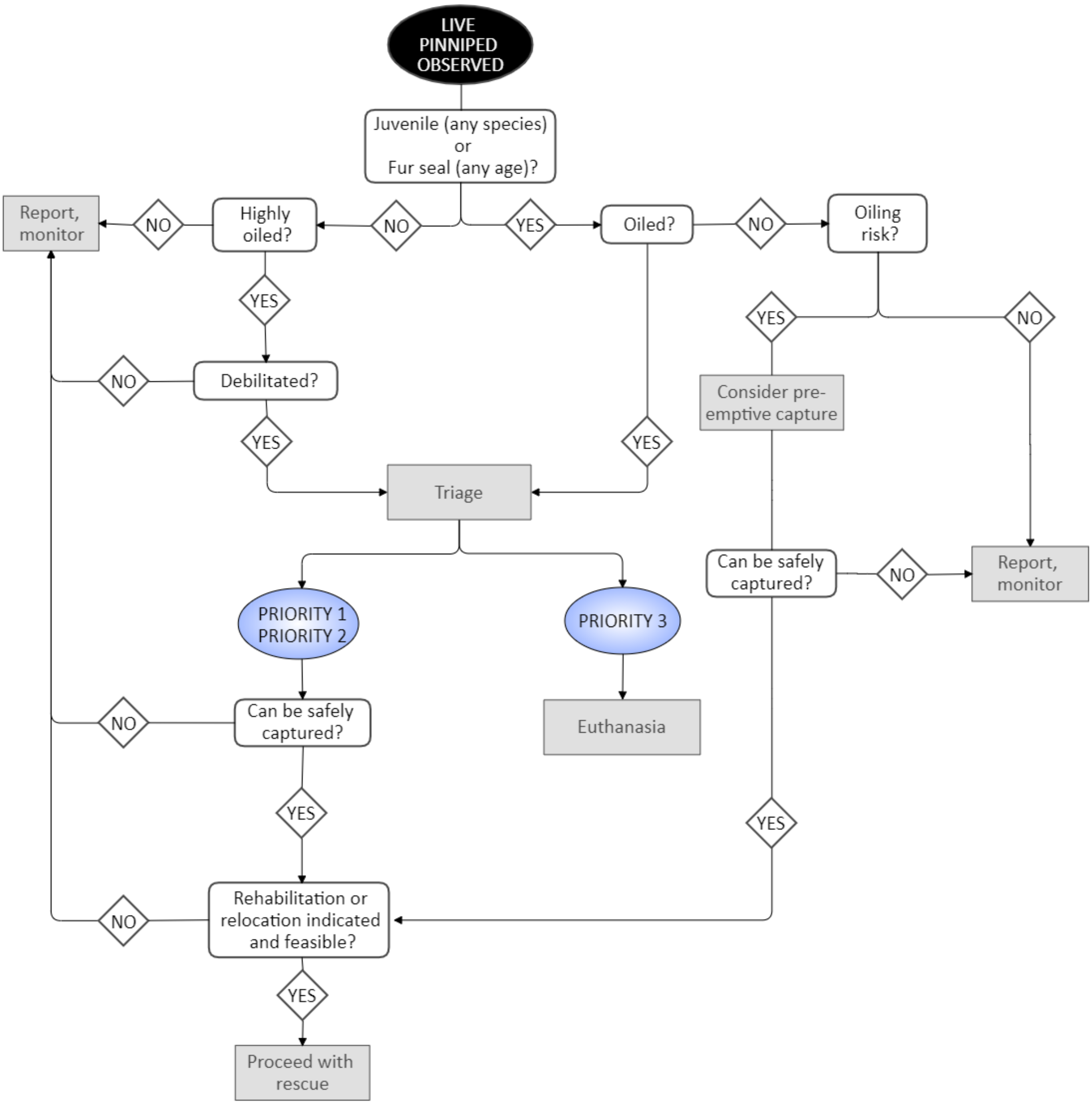


Figure P-3- 2 Intervention flow chart for live pinnipeds during an oil spill (adapted from Ziccardi et al. 2015)

Note: in general, free-swimming or beached pinnipeds in the vicinity of an oil spill will not warrant intervention unless the animal is in obvious distress.

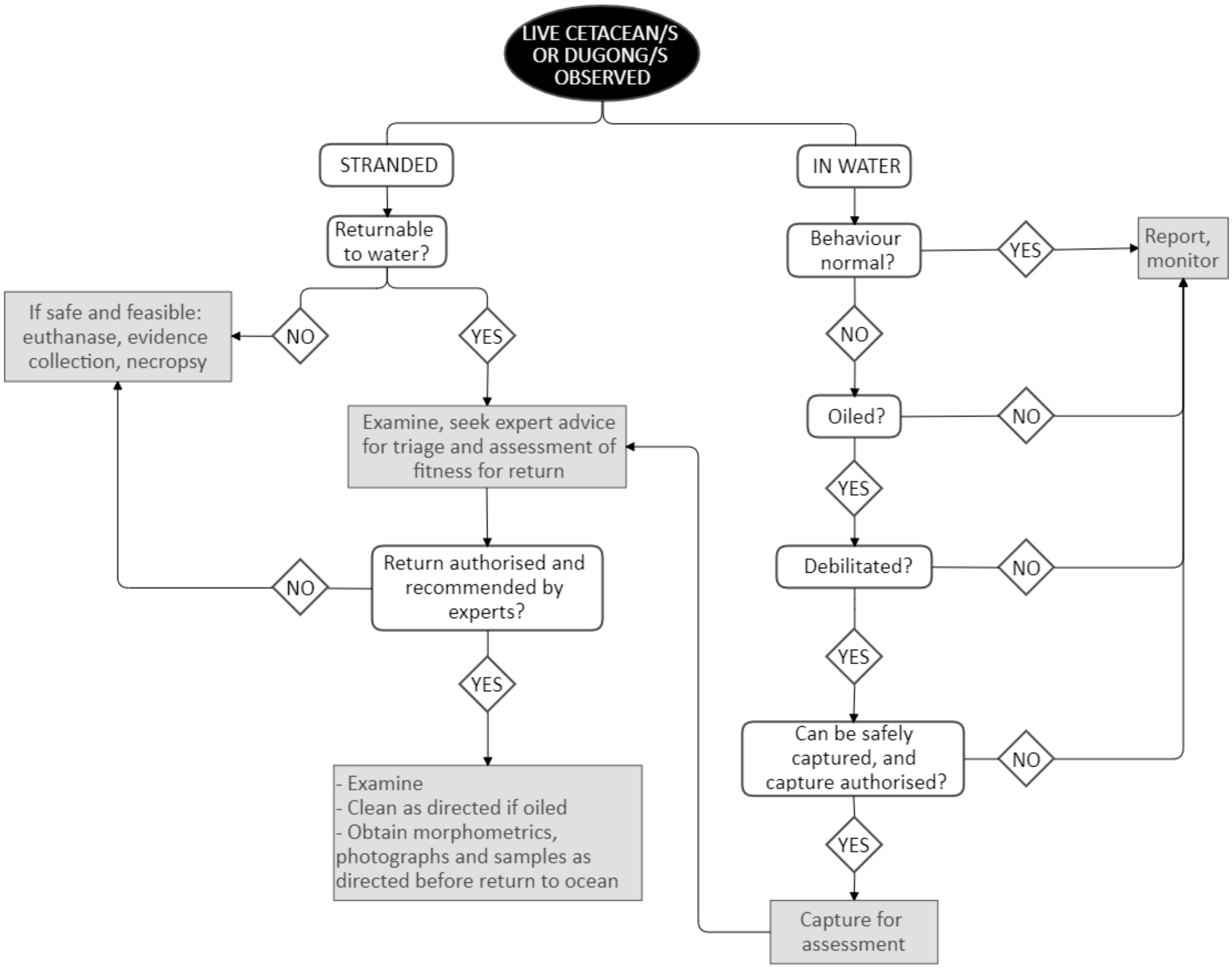


Figure P-3-3 Intervention flow chart for live cetacean and dugongs during an oil spill (adapted from Ziccardi et al. 2015)

P4 OWR PROCEDURE: PHASE 4 WILDLIFE FIELD PROCESSING

Responsible personnel: Rescue team; Field processing team

Recording requirements:

L3-1	Oiled wildlife rescue - collection tag
F4-1	Individual animal chain of custody record
F4-2	Oiled wildlife admission log
F4-3	Oiled wildlife live animal assessment
F4-4	Animal transport log

Individual identification bands (Tab band® or plastic spiral bands)

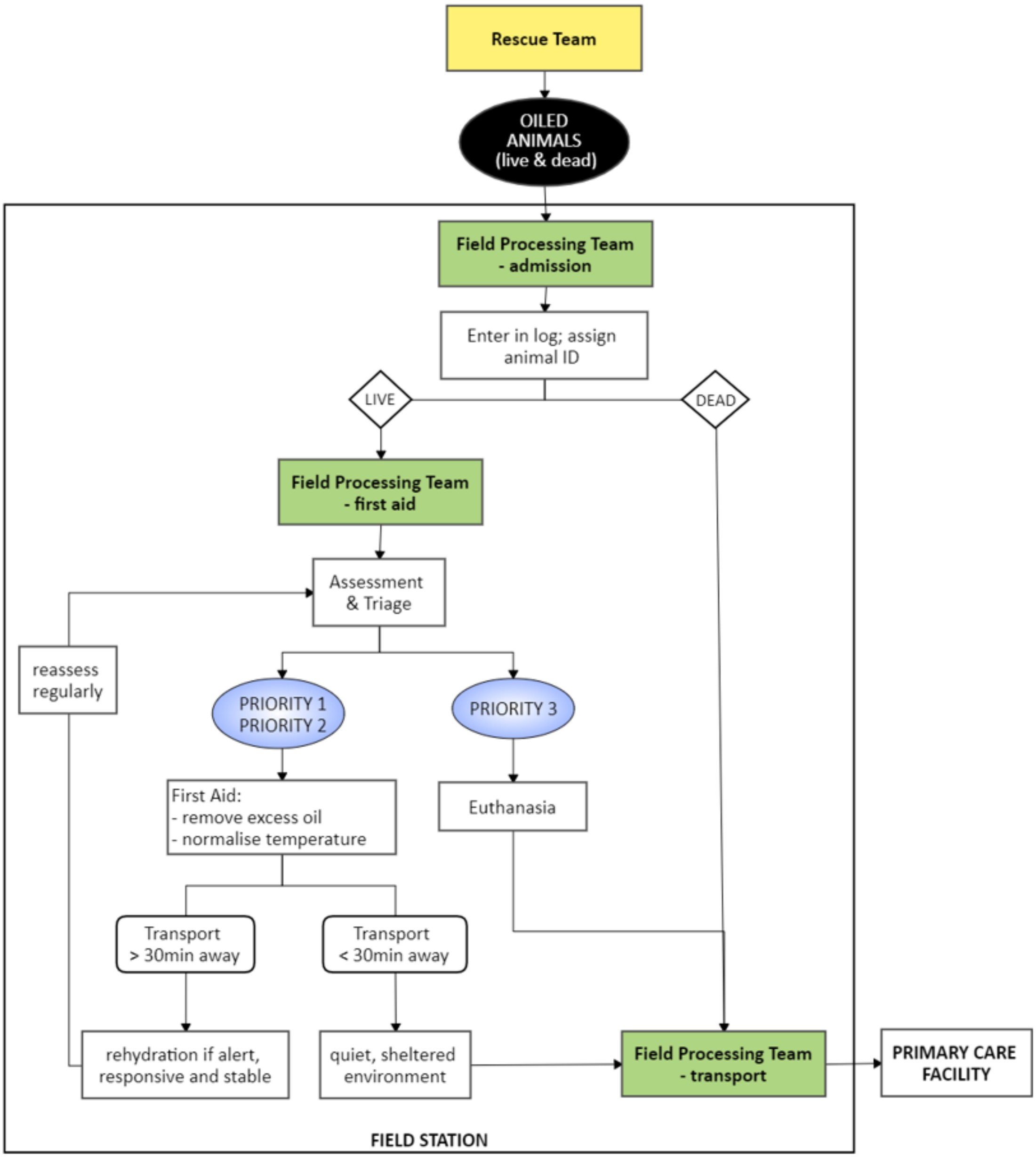


Figure P-4- 1 Work flow: wildlife field processing

1. Purpose and Scope

This procedure describes the establishment and function of an oiled wildlife field station and provides guidance for the activities of the field processing team, including first aid, assessment, triage and treatment, and transport of animals.

2. Human Safety

All Wildlife Unit personnel should be familiar with G-1 *Workplace Health and Safety*, which provides information on job safety analysis and incident reporting processes, and a risk assessment and mitigation matrix for each phase of OWR activity.

The following hazards have been assessed as "high risk" for personnel undertaking wildlife field processing activities:

- exposure to oil pollutants and contaminants
- environmental exposure (dehydration, hypothermia, hyperthermia, sunburn, heat stroke)
- stress, fatigue and burnout
- physical injury – animal bites, scratches and stab wounds

See G-1 *Workplace Health and Safety* for the full risk assessment of field processing activities.

3. Equipment and Facilities

3.1 Facility setup

A field station should be equipped with means of managing ambient temperature, ventilation, shelter, privacy and light. There should be adequate spaces for the following wildlife activities:

- a *reception point* where rescued animals can be brought for admission, logging and transfer of chain of custody;
- a *field first aid area* for animal examination, triage and treatment;
- a *holding area* holding for individuals awaiting transport to the PCF

"Hot", "warm" and "cold" zones should be set up within the field station. The flow of people and wildlife should be carefully planned and managed to reduce oil contamination. Figure P-4-2 demonstrates a notional floor plan for a field station which is servicing Phase 1-4 of the OWR.

3.2 Facilities for a remote area response

Oil pollution of remote areas (e.g. offshore islands, offshore oil and gas constructions, inaccessible coastline) may present significant logistic issues for OWR. Offshore camps, settlements or vessel-based facilities, may be part of the response in such instances. Although the OWR in a remote location may change in response to resource and logistic constraints, the priorities of human safety, animal welfare, evidence collection and documentation remain the same.

In some cases, the location of a spill may mean that the field station is the PCF for the response. Figure P-4-3 shows an example layout of vessel-based or remote field station which is also the PCF. The procedures for the PCF (P-5i, P-5ii, P-6 and P-7 of this Manual) should be adapted to meet the field constraints when the field station is also the PCF.

3.3 Equipment

See Appendix A of the WA Oiled Wildlife Response Plan for equipment checklists. The Field Station is the likely base for the equipment and resources for Phase 1-3 as well as Phase 4 OWR.

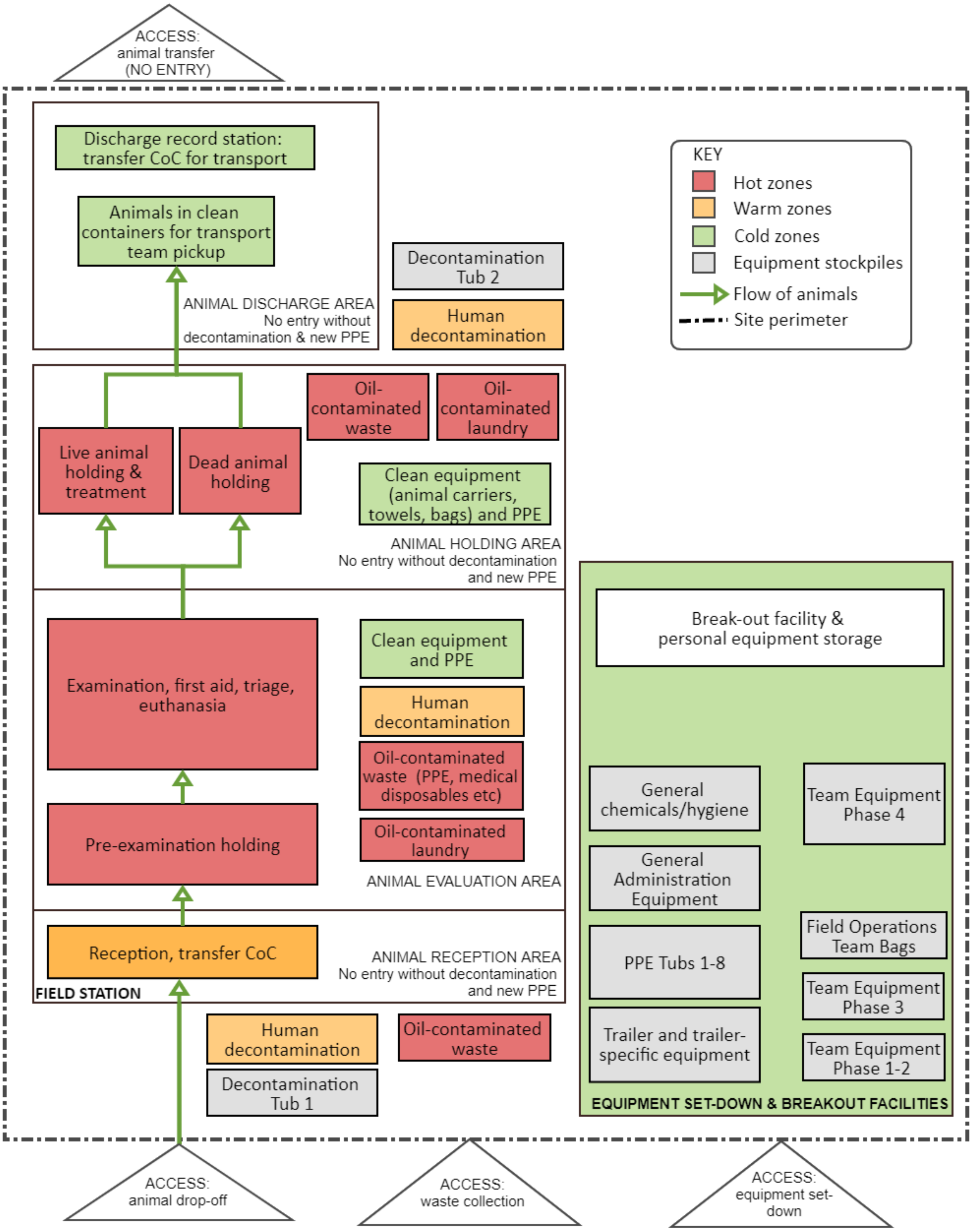


Figure P-4-2 Example floor plan for an OWR Field Station

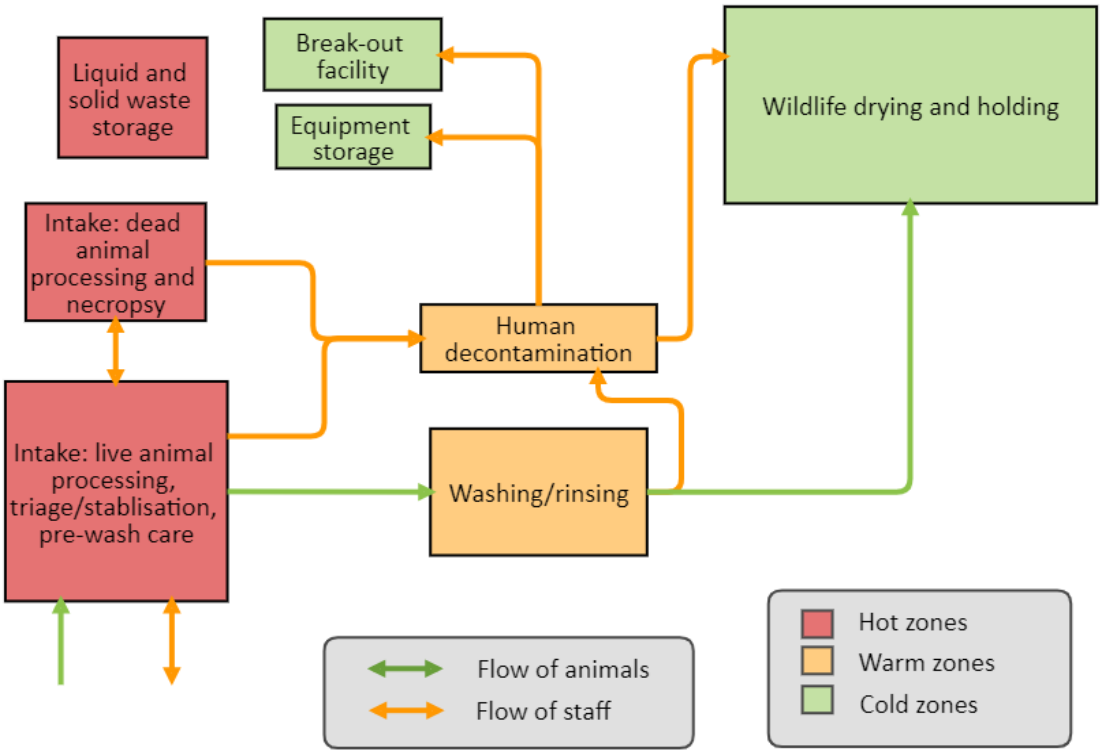


Figure P-4-3 Example layout for a vessel-based or remote area wildlife facility

4. Field processing activities

4.1 Field admissions and identification

All individuals, living and dead, should be presented by the Rescue Team in individual containers labelled with a collection tag (*L3-1 Oiled wildlife rescue – collection tag*).

Each admission (living or dead) requires a F4-1 *Individual animal chain of custody (CoC)* form to ensure that all animals are correctly managed in accordance with the legal requirements for evidence collection. This form should be commenced at handover from the Rescue Team, with a Rescue Team member being the first relinquishing person and a Field Processing team member being the first receiving person.

An admissions log (F4-2) is maintained to record each animal (both live and dead) delivered to the Field Station. Each facility where wildlife is admitted and logged should be assigned a simple 1-2 letter facility code. When an animal is first admitted to any facility, it is given an identification number consisting of the facility code, followed by a three-digit consecutive number. For example, the first animal admitted to Field Station F would have the ID F001, whereas if it were the first animal admitted at Primary Care Facility P, would be P001. The animal identification number is used for the duration of the animal's time in care and ensures no two animals will have the same identification, regardless of where they are admitted.

The admission log at a field station only contains the log of animals for that station. If transferred to another facility (e.g. the PCF), the animal will be entered on the admissions log at the new facility as a transfer, rather than a new admission, and its ID number will be retained (see P-5i of this Manual).

Each individual (live and dead) should be given a visual ID tag. This is usually a paper TAB® band, affixed to the leg or flipper during processing. The animal's ID number is written directly on the band in permanent marker (see Appendix A-8 of this Manual for diagrams). Vary the band colours between individuals so that it is easier to tell individuals apart and use the colour abbreviations shown in A-8 to record the band information on paperwork (e.g. pink band for bird F012 is recorded as F012/P). TAB® bands may not be practical for certain species; other means of marking individuals are outlined in Appendix A-8. Individuals marked in alternative ways should still receive an ID number as described, and their alternate marking should be recorded on the admission log and other paperwork.

4.2 Triage

Triage is the process of prioritising and sorting cases based on their health, welfare, conservation value and resource availability. G-4 *Euthanasia Plan* outlines the process for making decisions on the management of wildlife cases during an oil spill.

Continued and repeated triage is important to good decision-making as rescue risks and resource availability are likely to change over time. Triage occurs whenever an individual is assessed.

Animal assessment and triage designates each animal to one of the following priorities:
Priority 1: good chance of successful rehabilitation – treat first;
Priority 2: reasonable chance of successful rehabilitation – treat after Priority 1 cases;
Priority 3: poor chance of successful rehabilitation – to be euthanased.

4.3 Animal examination

Examination, triage and first aid should be delivered quickly and quietly in the same handling event, minimising the handling time of any individual. Work in teams of one handler, one examiner and one scribe and aim for a 3-5 minute handling. Record findings on F4-3 *Live animal assessment.*

Avoid cross-contamination of oil from one individual to another by not re-using contaminated equipment, holding containers or PPE. Avoid animals contacting plastic products (gloves, containers, plastic bags and instruments) until oil sample evidence has been collected (use of corflute and plastic pet packs for holding live animals is acceptable). Personnel should always use nitrile gloves for personal safety, but where possible, avoid contact of the gloves with oiled animals by using items such as towels, calico bags, and pillowcases as a barrier.

To minimise handling time, the following procedures should be undertaken *before handling:*

- enter animal on admissions log and start chain of custody and live animal assessment forms
- prepare an identification band or other identification as described in Section 4.1;
- examine the animal in the container, confirm its species and age if possible. Observe posture, demeanour and respiratory effort, and record findings;
- warm up oral fluids if gavage is to be undertaken (see Section 4.4)
- ensure a clean pen/box is available to contain the animal as soon as examination is completed.

Remove the animal using a towel to gently confine its movements, then proceed as follows:

- *attach identification*
- *remove gross contaminant oil* from eyes, nostrils, mouth, glottis and turtle shell using cotton buds or gauze soaked in water or saline;
- *take temperature* where possible, and/or *look for signs of hypothermia or hyperthermia;**
- while waiting for the thermometer to register, assess and record *degree of oiling*;

- examine for any *severe or life threatening injuries* which may warrant a Priority 3 triage and immediate euthanasia. If euthanasia is warranted, follow G-4 *Euthanasia Plan*.

*** NOTE:** If the body temperature is severely abnormal (<38°C or >41.5°C for birds; <20°C or >32°C for sea turtles; < 36°C or > 40°C for marine mammals), it must be normalised before undertaking further examination or treatment. If it is not possible to take a temperature, feel the extremities and observe behaviour to evaluate if animals are too cold (shivering, listless, cold flippers) or too hot (panting, open mouth breathing, hot flippers). Unless hypothermia is observed or suspected in pinnipeds, they are best kept damp and cool.

4.4 First aid

The goal of field first aid is to *stabilise the animal to increase likelihood of survival.* This involves normalising body temperature, beginning the rehydration process, addressing immediately life threatening conditions, and providing a low stress environment for awaiting transport.

If the animal is assessed as Priority 1 or 2 and abnormal body temperature has not postponed further examination, proceed with further first aid as follows:

- C*heck eyes* for corneal damage using fluorescein stain if there is a suggestion of eye damage, especially in sea turtles, and flush eyes/apply lubricant if they appear irritated.

- *Manage wounds*: investigate any sources of fresh blood and apply dressing as required (NB: if internal organs or underlying bones are visible, this is likely to be grounds for euthanasia).

- *Address temperature extremes*: **Hypothermia** can be addressed by placing containers in sheltered positions or within heated rooms. Insulating bedding such as towels should be changed regularly if wet or soiled. Direct heating can be applied using hot water bottles or heat packs, but take care to ensure the animal is protected from burns. Electric heat sources (e.g. heat pads, heating lamps) can also be considered. Warm water baths (approx. 28°C) will address hypothermia in sea turtles, but take care to ensure the bath is maintained at an appropriate temperature and is not too hot or cold. **Hyperthermia** can be addressed by placing animals in a shady area with air movement to blow air through the ventilation holes of the container. Cooling may also be initiated by gentle spraying with water, or by placing ice packs on top of, or under, the container.

- *Consider rehydration*: Birds which are alert, responsive, at <u>normal body temperature</u> and will not be transported for at least 30 minutes may be candidates for oral fluid therapy by gavage**. Turtles which are not going to be transported for at least 30 minutes may commence immersion fluid therapy. See G-5 *Fluid therapy & nutritional support* for details on fluid replacement regimes.

** **IMPORTANT NOTES** on specialised therapy activities:

Gavage is a specialist exercise and should only be undertaken by experienced practitioners. In the case of reptiles and mammals, it is unlikely that gavage before transport will be indicated, over and above getting them to specialist care. <u>Do not gavage any animal within 30 minutes of transport</u>.

If experienced veterinary personnel and medical resources are available, other procedures may be possible (e.g. wound management, blood sampling, parenteral fluid administration). However, additional processes should only be undertaken they don't delay transfer to a specialised facility, or if likely to improve the prospects of surviving the transfer to the PCF. Administering therapeutic drugs before stabilisation is not recommended. All medical procedures should align with P-5i of this Manual and G-5 *Fluid therapy & nutritional support.*

4.5 Field processing – dead animals

Dead oiled animals should be banded with a tag displaying their identification number (see Section 4.1), then bagged as follows: cut a length of aluminium foil and place on a surface dull side up. Wearing clean nitrile gloves (new pair for each individual), place the body on the foil, and wrap it securely and completely in the foil. Tape the foil securely using gaffer tape. Use a permanent marker to label the tape with the species, date, time and location of collection (copied from the collection tag). Add your initials written halfway on the tape and halfway on the foil to demonstrate it has not been tampered with.

Place the foil-wrapped body inside a ziplock bag, then double bag to prevent leakage. Paperwork can be placed inside the outer bag to ensure it remains with the body. Where possible, refrigerate or place in an esky with an ice pack pending transport to the PCF or other storage facility.

4.6 Containment and transport

Live animals should be transported in individual containers, labelled with L3-1 *Oiled wildlife rescue-collection tag*. Animals should be individually identified and their transfer entered on the admission log before transport.

A variety of containers may be used to transport wildlife depending on the size and species. Containers must allow *air circulation* (holes on all four sides of enclosed containers); the floor of the container must be *padded* (towels are appropriate for most taxa; suspended knotless netting floors are ideal for seabirds), and the container should not include any material that could be accidentally ingested. Flatpack corflute pet transport boxes will be appropriate for small to medium-sized birds; airline transport boxes provide more robust and secure containment of small to medium-sized mammals and larger birds. Turtles should be placed on a wet towel in a clean open-topped container covered with a clean (non-oiled) towel.

Fresh air flow and temperature control are critical for animals in containers. Containers awaiting transport should be placed in the shade or in a climate-controlled area and monitored regularly to ensure protection from heat and cold. Avoid stacking containers on top of one another for transport and ensure the vehicle cabin is well ventilated. Maintain a minimum distance of 50-100mm between boxes and ensure two sides of each box are exposed to circulating air.

Animals in open crates, pools or slings should be protected from the sun and kept wet at all times. A transportation temperature around 25°C is generally appropriate, but this may need to be modified based on the thermal needs of the species.

Animals in transit must be managed and monitored carefully to minimise stress. Secure all containers during transport such that they do not slide around or tip over. Minimize light, noise, and jostling of the containers to the degree possible. If the journey is longer than two hours, it may be necessary to consider additional fluid support if personnel are trained and appropriately equipped. As a rule, transport stops should be made once an hour to check on the condition of the animals.

Ensure all paperwork (F4-1 *Individual animal chain of custody record*; F4-3 *Live animal assessment)* accompanies each individual. Do not leave animals unattended until chain of custody is transferred, and paperwork has been handed over to the receiving facility.

P5i OWR PROCEDURE: PHASE 5 INTAKE – ADMISSIONS & LIVE ANIMAL PROCESSING

Personnel: Intake team

Recording requirements:

Forms:

F4-1	Individual animal chain of custody record
F4-2	Oiled wildlife admission log
F4-3	Oiled wildlife live animal assessment
F5-1	Oil sample chain of custody form (WA ChemCentre)

Labels:

L3-1	Oiled wildlife Rescue - collection tag
L5-1	Wildlife Intake - oil sample evidence
L5-2	Wildlife Intake - photo evidence live animal
L5-5	Wildlife Intake - memory card evidence

Individual identification TAB® bands

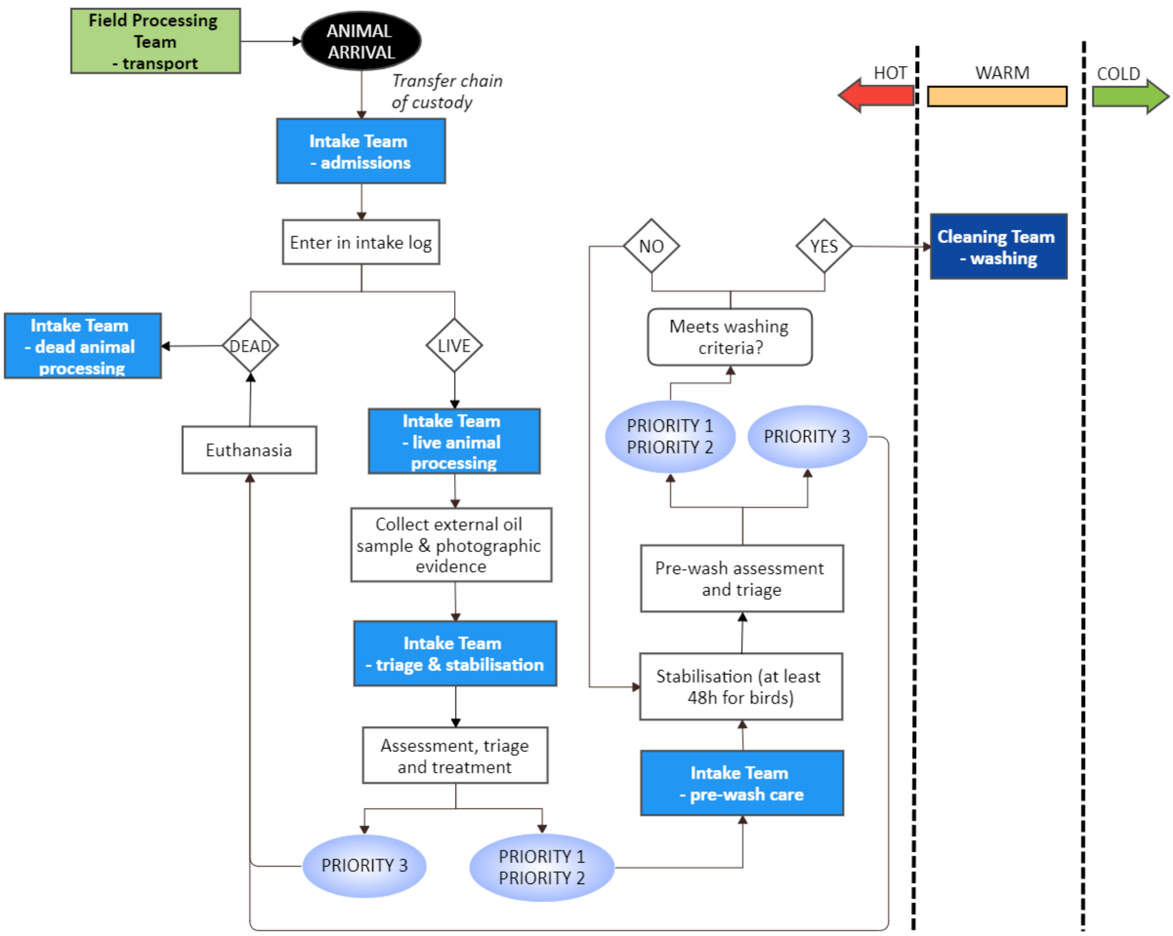


Figure P-5i- 1 *Work flow: wildlife intake*

1. Purpose and Scope

During a marine oil pollution event, it is essential that oiled wildlife is processed in a manner that prioritises human safety, animal welfare and the collection of appropriate evidence.

This procedure provides guidance for (i) the admission and documentation of oiled wildlife (both live and dead) and (ii) the humane and effective processing, assessment and treatment of live wildlife prior to cleaning (Section 4.2 onward). The post-admission processes for dead wildlife are in P-5ii of this Manual.

2. Human Safety

All Wildlife Unit personnel should be familiar with G-1 *Workplace Health and Safety*, which provides information on job safety analysis and incident reporting processes, and a risk assessment and mitigation matrix for each phase of OWR activity.

The following hazards have been assessed as "high risk" for personnel undertaking wildlife intake activities:

- exposure to oil pollutants and contaminants
- stress, fatigue and burnout
- physical injury – animal bites, scratches and stab wounds
- physical injury – needle sticks, lacerations
- exposure to hazardous chemicals

See G-1 *Workplace Health and Safety* for the full risk assessment of wildlife intake activities.

3. Equipment and Facilities

3.1 Facility setup

See G-6 *Setting up a primary care facility* for facility requirements of the intake area. Intake is within the "hot zone" (areas where oiled materials are present) of the PCF.

3.2 Equipment

See Appendix A of the WA Oiled Wildlife Response Plan for equipment checklists.

4. Wildlife Intake Activities

The following processes are adapted from Oiled Wildlife Care Network (2014).

4.1 Admission: Intake Log and Identification

For hygiene purposes and to enable rapid processing of live animals, there should ideally be separate intake teams for live and dead animals. If there is a single team, live animals are given priority.

All individuals, living and dead, should be in individual containers labelled with a collection tag. If initial processing has been undertaken in the field, each individual should also have a numbered identification band, an assessment form and a chain of custody (CoC) record. Before letting the deliverer leave, ensure there is collection information associated with the animal, and that the CoC is signed over. If there is more than one animal in a container, separate them and note which individuals were housed together, in case of cross-contamination. Transfer the information on the collection tag or CoC record to the facility admissions log (F4-2).

If an animal is a new admission, rather than a transfer from a field station, it will need to be given an individual ID and leg band as described in P-4 (Section 4.1). The leg band should be prepared at admission and attached to the animal's paperwork for attachment during processing (Section 4.2.1). The ID will consist of the 1-2 letter facility code for the PCF, followed by a three digit sequential number. Animals which come via a field station should already have been assigned an ID and banded when admitted to the field station.

Ensure that live animals are cushioned by a towel, netted floor or other soft material in the box, and that they are in a large enough container.

Animals which were dead when collected should already be appropriately wrapped to avoid plastic contamination and labelled as evidence as described in P-4 of this Manual. Refer to P-5ii for ongoing processing of dead bodies.

Live animals are arranged for processing in order of urgency as follows:
- deal with endangered or threatened species first;
- prioritise any individual in a critical condition or in distress;
- process all other individual in order of their arrival.

4.2 Live animal processing

The priority of the intake assessment team is to address the welfare needs of the individual as quickly as possible, preferably within a single handling event which is kept as short as possible to minimise stress. For this reason, initial processing is combined with the medical examination.

4.2.1 Records and identification

Ideally, work in teams of one scribe, one animal handler and one examiner whenever handling animals.

Examine the animal in the container, confirm its species, and write this information on F4-3 *Oiled wildlife live animal assessment* and on the admissions log (F4-2). Observe its posture, attitude and respiratory effort before handling, and record findings on F4-3.

Remove the animal from its container and confirm leg band number and colour (or attach a new band if not already banded). Record the band number and colour on F4-3.

Begin the Case Summary record on the back of F4-3 and start F7-1 *Daily progress record*.

4.2.2 Processing: external oil sample evidence

Oil sampling and evidence handling processes are adapted from Stacy et al (2019), Ziccardi et al (2015) and Oiled Wildlife Care Network (2014), in consultation with WA ChemCentre.

Oil samples collected from wildlife must be collected, labelled, documented and stored carefully to prevent cross-contamination and enable their use as evidence in investigation of the pollution event.

Figure P-5i- 2 summarises the sample collection process. If there are separate teams for live animal processing and triage/stabilisation, processing is undertaken first.

Instruments used for sample collection should be cleaned with detergent followed by a 70% alcohol rinse between animals to avoid carry-over of oil from one individual to another. Avoid contact of the sample with plastic products, including nitrile gloves and plastic bags, plastic instruments, or the insides of lids and containers. Personnel involved in oil sampling should always use nitrile gloves for personal safety, but where possible, avoid contact of the gloves with the sample by using towels to handle the animal and scissors, haemostats and other metal instruments to handle the sample.

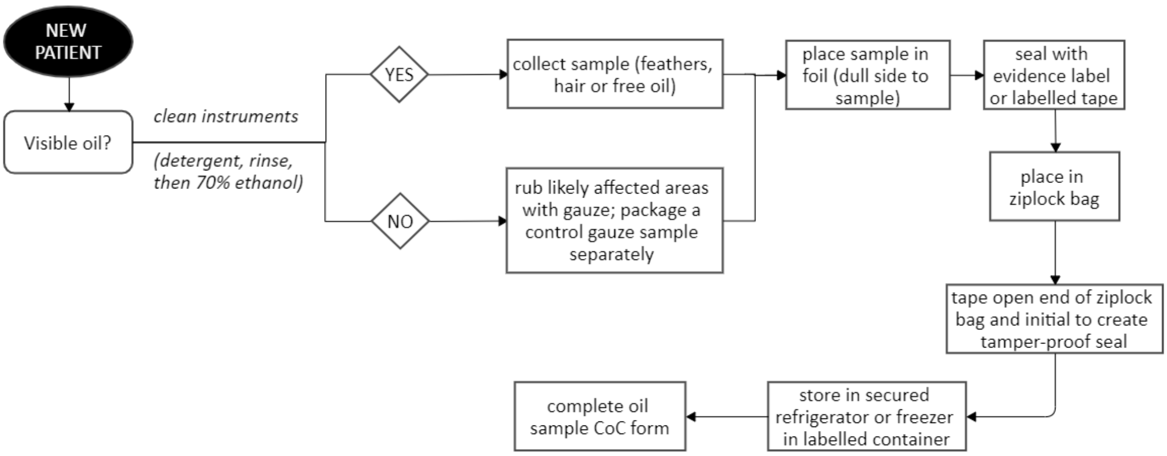


Figure P-5i- 2 Collection of oil samples

If animals are not visibly oiled, rub most likely affected areas (e.g., skin, mouth) with a piece of gauze held in forceps or haemostats. A paired clean sample of the gauze used should be included in a separate container, labelled as a control, for comparative petrochemical analysis.

If animals are visibly oiled, take the following samples:
Birds: Using haemostats, pluck 5 completely oiled body feathers (~100 mg of oil). NB: cut feathers will not grow back until the shaft moults, so plucking encourages more rapid return to function. For obvious reasons, feathers taken from dead birds may be cut. If the feathers are only oiled superficially, collect more feathers – generally enough to equal 5 heavily oiled contour feathers. Feathers should be taken from more than one location, and if possible, above the water line, to minimize waterproofing impacts.

Reptiles and mammals: scrape visible oil from fur/skin with a wooden tongue depressor, or cut oiled fur where this is possible (as long as it will not create thermoregulation problems for the animal).

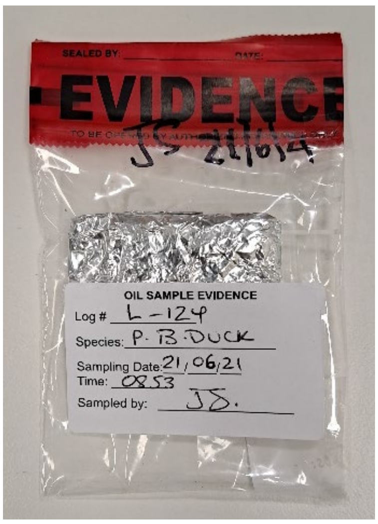


Figure P-5i- 3 Sealed and labelled oil sample evidence

Samples can either be collected in certified contaminant-free glass jars or aluminium foil pouches placed into plastic ziplock bags. The dull side of the foil should be in contact with the sample and the foil is folded and taped to completely cover the tissue and prevent any contact with the plastic bag. Apply a completed L5-1 *Wildlife intake - oil sample evidence* label, or gaffer tape labelled directly with a permanent marker, to fully seal the foil before it is placed in the ziplock bag (Figure P-5i-3). Tape the open end of the ziplock bag and add your initials written halfway on the tape and halfway on the bag to demonstrate it has not been tampered with. Clean and dry surfaces thoroughly before applying tape. Avoid wrinkles and exposed adhesive surfaces.

Refrigerate or freeze samples after collection in a designated container. Containers should be clearly marked as oil samples, along with the animal ID numbers contained within. A chain of custody form for oil sample evidence (F5-1 *Oil sample CoC form*) should accompany samples while in storage and when transferred to a laboratory for analysis. If sealed items are to be frozen, place them in a second bag before

freezing to avoid damage to the tape and accidental loss of the seal after freezing. Use evidence tape that is known to withstand freezing.
Freezers containing evidence should be locked. It is best if three or fewer people are designated key holders and primary evidence custodians for a given facility. An entry log should be maintained for freezers containing evidence. All access should be documented by date, time, individual, and purpose. Any evidence deposited or removed should be clearly noted.

4.2.3 Processing: photographic evidence

Photo-documentation processes are adapted from Stacy et al (2019) and Oiled Wildlife Care Network (2014).

Each intake assessment is carefully photo-documented as follows:
A standard photo backdrop is created which includes the following information in clear writing: Spill Name; Facility Name; Date; Animal ID; Species. A laminated label (L5-2) or a permanently marked white board (Figure P-5i-4) can be used to reduce re-writing. The backdrop is included in the first photograph for an individual, to clearly demarcate the images for each case.

Position the animal so that the oil is visible, the label is clear, and the species can be identified (if possible). Take the photo as close as possible without excluding these vital components. Both dorsal and ventral surfaces of turtles should be photographed. Confirm the photo is acceptable before proceeding.

Figure P-5i- 4 Example of intake assessment photo backdrop (OWCN 2014; used with permission)

Once a picture has been taken it must not be modified in any way (this includes erasing and downloading images from a memory card to a computer). No photograph should be deleted from a memory card.

Have spare memory cards available and label all used memory cards by placing in an envelope labelled with L5-5 *Wildlife intake – photo memory card evidence*. Place the label over the envelope seal to prevent tampering and attach chain of custody documentation. Secure the camera and memory cards in a locked evidence cabinet.

4.3 Live animal intake – triage and clinical assessment

The triage and stabilisation team will ideally include a veterinarian with wildlife expertise. Team members should be experienced in animal handling and at least one member should have good wildlife identification skills.

Each animal should receive a rapid (ideally < 5 minutes) medical examination following processing, to inform the triage process. Work in teams of one examiner, one handler and one scribe and record findings on F4-3 *Live animal assessment.*

The triage process described in P-4 is continued in Phase 5 and repeated at each evaluation. Table P-5i-1 summarises the clinical criteria which inform the triage process. G-4 *Euthanasia Plan* contains further detail about non-clinical triage criteria.

The degree of external oiling is not necessarily a good indicator of prognosis. Heavily oiled animals may still have a relatively good prognosis if they are clinically well; conversely, animals with no visible external oil may be seriously impacted by oil ingestion or inhalation.

Table P-5i - 1 Clinical criteria for triage of oiled wildlife (after IPIECA 2017)

PRIORITY	CLINICAL CRITERIA
Priority 1: good chance of successful rehabilitation – treat and rehabilitate first	systemically bright and alert PCV 30-60%, TP>25g/L (birds) normal body temperature no major wounds or signs of infectious disease
Priority 2: reasonable chance of successful rehabilitation – treat after Priority 1	hypothermia (birds <39°C; pinnipeds <36°C) hyperthermia (birds >41°C pinnipeds >39°C) depressed or debilitated minor wounds or injuries
Priority 3: poor chance of successful rehabilitation – to be euthanased	PCV <30% or >60%, TP<15g/L (birds) unable to maintain body temperature profound hypothermia (birds<37°C; pinnipeds <35°C) or profound hyperthermia (birds>42°C; pinnipeds > 40°C) agonal breathing severe wounds (e.g. large or severe pressure or trauma lesions; fractures) severe weight loss/emaciation presence or suspicion of infectious disease which threatens the health of the population in care and/or wild populations permanently impaired vision long-term waterproofing problems any other sign which threatens likelihood of a timely and complete recovery

The following order of clinical assessment is broadly applicable to all species:

i. *Observe:* observe behaviour and responsiveness within the transport box before restraint;

ii. *Weigh:* remove the animal using a towel and weigh (weigh the towel in advance and tare or subtract this weight);

iii. *Check cloacal/rectal temperature:* if it is severely abnormal (<38°C or >41.5°C for birds; <20°C or >32°C for sea turtles; < 36°C or > 40°C for marine mammals), stabilise temperature before proceeding. If it is not possible to take the core temperature (e.g. conscious adult pinnipeds), feel the extremities and observe behaviour to assess thermal status;

iv. *Check eyes, nares and oral cavity*: note mucous membrane colour and estimate percentage dehydration. If there is a suggestion of corneal damage, apply fluorescein stain, then flush eyes with saline and apply lubricant;

v. *Check heart and respiratory system:* determine strength and pattern of respiratory and heart sounds (rates are not usually necessary);

vi. *Assess body condition*: In birds this involves palpating the muscle mass over the keel;

vii. *Assess musculoskeletal system*: palpate and move limbs, checking for fractures and restriction in mobility; check the wing webs in birds for restrictions and wounds; ensure the skin overlying the keel moves freely and is not adhered by pressure sores or wounds;

viii. *Assess feet:* Check the feet and hocks for injury and swelling, particularly in seabirds, and ensure no burns are present.

ix. *Assess other body systems:* Undertake examination of specific systems as shown on F4-3.

x. *Take a blood sample*. Filling the hub of a 23-25G needle will usually give enough blood to fill two microhematocrit tubes for PCV and TS (Figure P-5i-5). This will generally be all that is required but larger samples may be collected at the direction of a veterinarian. Blood sampling sites for selected taxa are illustrated in Figures P-5i-6 to P-5i-9. The final decision on sampling site rests with the veterinarian, but commonly used sites are:

Birds: medial metatarsal vein (foot veins may be better site for penguin and pelicans) – avoid wing veins due to haematoma risk

Sea turtles: external jugular vein (also known as dorsal cervical plexus/sinus)

Otariid pinnipeds (sea lions and fur seals): interdigital or caudal gluteal veins

4.4 Live animal intake – blood assessment

The two tests which are routinely evaluated for oiled wildlife are packed cell volume (PCV, also known as haematocrit) and total protein (TP, or total solids [TS]). These tests have been shown to be useful indicators of prognosis for oiled wildlife and are fundamental to the triage process.

PCV is a measure of the percentage of red blood cells in a blood sample. It is measured by placing a small amount of blood in a narrow glass haematocrit tube (see Figure P-5i-5) which is spun in a centrifuge. The cells settle to the bottom of the tube, allowing the red cells to be measured as a percentage of the column of blood.

Red blood cells are damaged by exposure to oil, causing a drop in the PCV (anaemia). This reduces tissue oxygenation, leading to lethargy and weakness. Conversely, when an animal is severely dehydrated, there is less water in the blood and the PCV may go up.

TP is a measure of the proteins in the plasma of the blood and is an indicator of nutritional intake, immune response and hydration status.

Interpretation of blood results should be done by experienced veterinary personnel. As a broad guide, a PCV < 30% or > 60%, and/or a TP of <15g/L in an oiled bird is associated with a poor prognosis and these individuals generally require euthanasia.

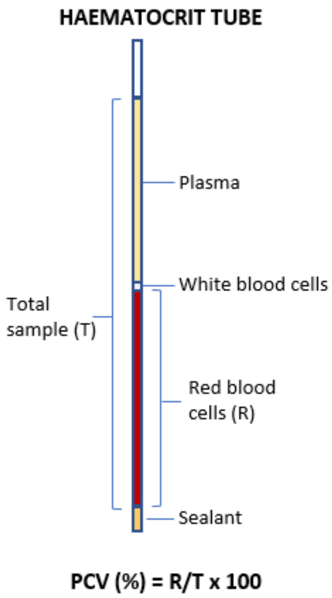


Figure P-5i-5 Determining PCV from a centrifuged blood sample

4.5 Live animal intake – treatments and preventative therapy

After completion of the examination and triage, treat Priority 1 and 2 patients as follows:

i. *Remove excess external oil* using moistened cotton swabs or gauze. Emulsifying agents such as vegetable oils or mayonnaise may assist in clearing oil from the oral cavity and eyes. Where possible, clean the cranial oesophagus of turtles using gauze clamped in a haemostat with a small coating of vegetable oil or mayonnaise;

ii. *Administer fluids*: Check the field records to determine if and when fluids were last administered and continue the fluid plan from that point in consultation with veterinary personnel. See G-5 *Fluid therapy and nutritional support* for information.

iii. *Administer antifungals* to susceptible bird species. Appendix A-3 *Standard preventative care for selected bird taxa* contains guidelines on the requirements of various bird species, but the final decision on the need for antifungals rests with veterinary personnel. See Appendix A-4 *Formulary* for dose rates.

iv. *Turtle gavage*: if internal oiling/ingestion is suspected in turtles, a mixture of 2 to 3 parts mayonnaise and 1 part cod liver oil may be administered by gavage. See A-4 *Formulary* for guidance. Note: gavage is a specialist activity in all species and should not be attempted by inexperienced or untrained personnel - see G-5 for more information.

v. *Apply preventative bandaging*: Padded wraps may be applied to birds with existing pressure injuries, and to species which are prone to developing such injuries (see Appendix A-3 for a list). The need for preventative bandaging should be assessed by veterinary personnel and/or experienced rehabilitators. See Appendix A-7 for preventative bandaging techniques.

vi. *Record all treatments* on F4-3. Confirm that the evidence collection section has been ticked off before advancing to pre-wash care.

4.6 Live animal intake – pre-wash care

Pre-wash care ensures that animals are stable enough to endure the stress and physical demands of the cleaning process. Oiled animals are provided with appropriate nursing (nutrition, fluids, preventative medication) to improve their condition until they are ready to be cleaned.

Specific stabilisation processes commonly undertaken in pre-wash care include:

- stabilising body temperature (hypothermia/hyperthermia) by heating or cooling as required;
- ongoing rehydration by administering fluid therapy
- minimising stress by providing a quiet, well ventilated environment;
- improve body condition and energy by feeding animals with appropriate nutritious food;
- preventing development of pressure injuries with preventative bandaging
- continuing treatment of existing wounds;
- monitoring trends in body weight and re-evaluating progress regularly.

Progress in pre-wash care is documented using F7-1 Oiled w*ildlife rehabilitation – daily progress record*. See G-5 *Fluid therapy and nutritional support* and Appendix A-5 *Dietary information charts* for fluid and nutritional support regimes.

All checks and sampling occur at the first handling of the day. This will include:

- checking of all bands and cage cards, and replacement/update as needed
- removal of preventative wraps on birds before weighing
- weighing and general visual assessment, paying particular attention in birds to pressure areas (keel, hocks, feet, elbows, wrists) for signs of lesions
- reapplication of preventative wraps

A full veterinary assessment should occur at least every two days. Animals that have been in care for the requisite minimum time may be evaluated to see if they meet wash criteria (see P-6 of this Manual). A list of animals ready for cleaning should be generated at the end of each day, and these animals should be serviced first in the morning, so they are able to be cleaned the same day.

If an animal fails a pre-wash examination, it should be carefully re-evaluated to determine the need for extra medical attention, or euthanasia due to poor prognosis.

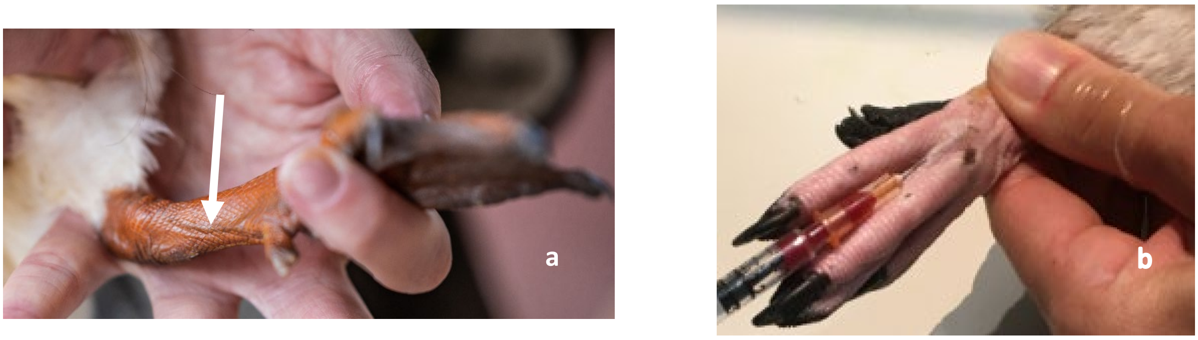


Figure P-5i- 6 *Venepuncture in water birds: a. medial metatarsal vein; b. foot venepuncture in a penguin (Images: WA Seabird Rescue)*

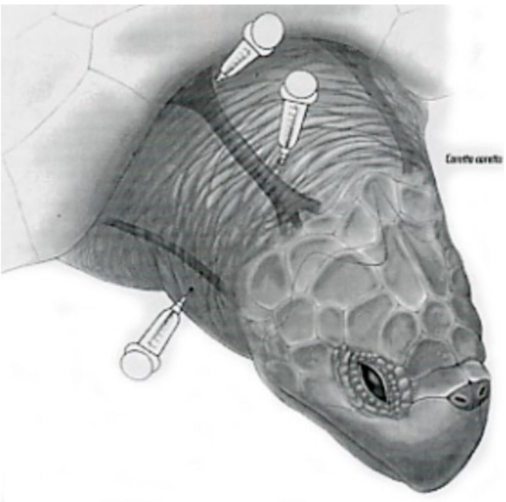


Figure P-5i-7 *Dorsal cervical plexus (also called external jugular vein, dorsal cervical sinus or supravertebral sinus) and lateral jugular venepuncture in sea turtles (Whitaker and Krum 1999)*

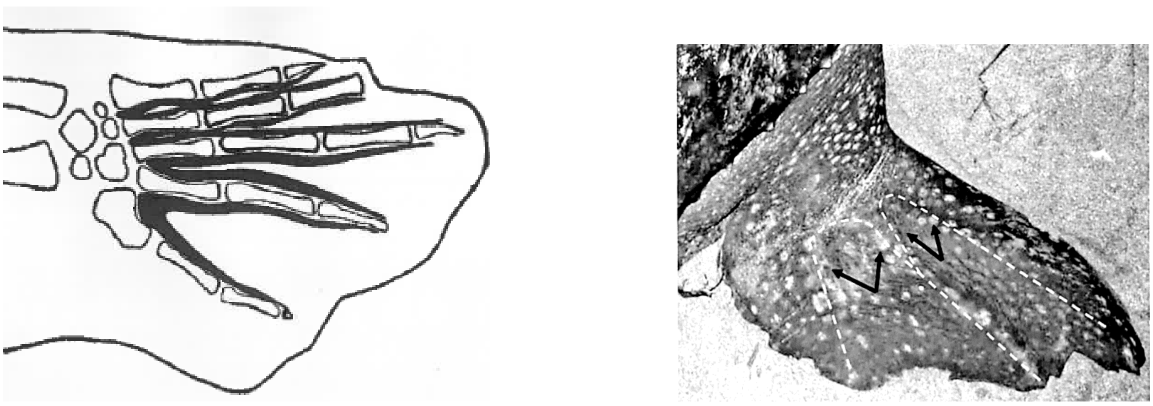
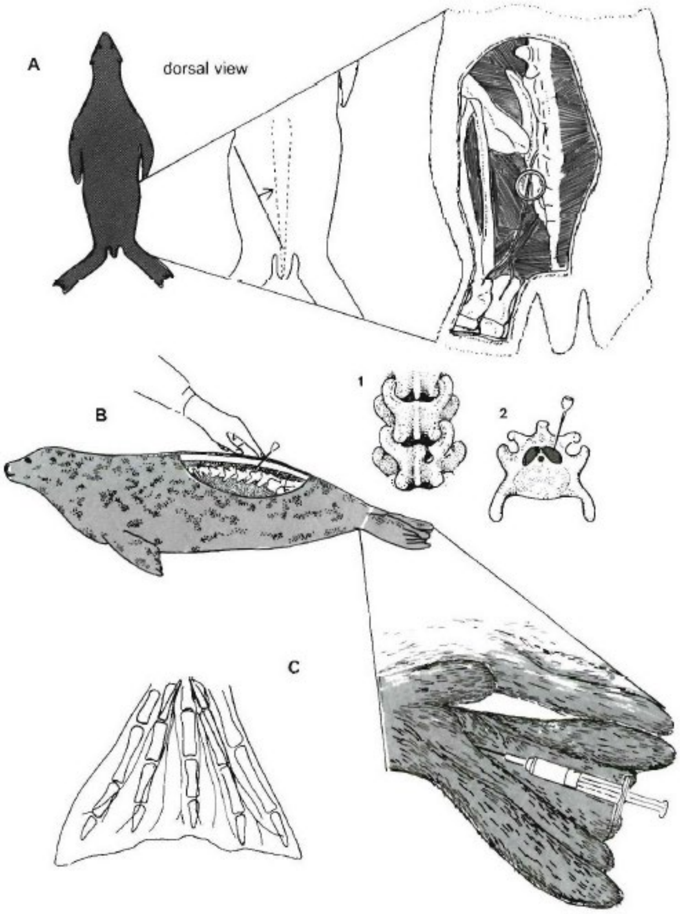


Figure P-5i-8 *Interdigital vessel venepuncture in leatherback turtles. Arrows show needle insertion points (Wallace and George 2007)*

Figure P-5i- 9 Blood collection sites for sea lions and fur seals (Geraci and Lounsbury 2005).

A. caudal gluteal vein – use a 4cm 18-20G needle; B. extradural space – needle is inserted between the dorsal spinous processes of the lumbar vertebrae and into the extradural vein; C. dorsal & ventral hind interdigital veins just medial to the lateral digit or lateral to the medial digit.



P5ii OWR PROCEDURE: PHASE 5 INTAKE– DEAD ANIMAL PROCESSING

Responsible personnel: Intake team

Recording requirements:

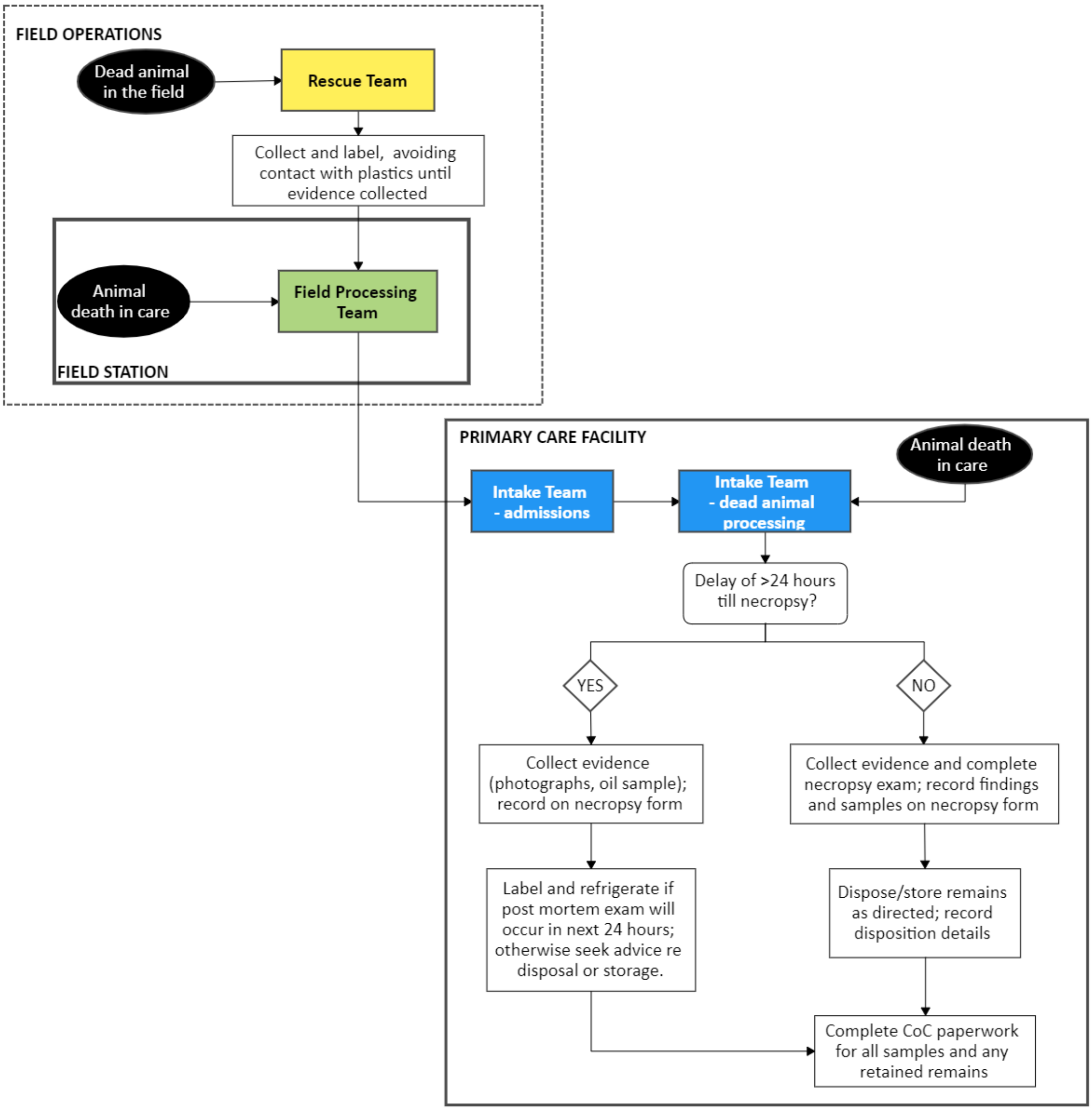
Forms:

F4-2	Oiled wildlife admission log
F5-1	Oil sample Chain of Custody form (WA ChemCentre)
F5-2 a-f	Wildlife intake – necropsy forms for various taxa

Labels:

L5-1	Wildlife intake - oil sample evidence
L5-3	Wildlife intake - photo evidence dead animal
L5-4	Wildlife intake - animal tissue sample
L5-5	Wildlife intake - memory card evidence

Figure P-5ii- 1 Work flow for dead oiled animals



1. Purpose and Scope

During a marine oil pollution event, wildlife may be found dead in polluted areas, or may die in care. It is important for investigation of the oil spill that bodies are recorded, and samples collected as evidence. Post mortem examination (necropsy) of bodies is a valuable tool for understanding the impact of oil spills on populations and species.

This procedure provides instructions on the process of collecting, storing and sampling of dead animals which are encountered during an oil spill event.

2. Human Safety

All Wildlife Unit personnel should be familiar with G-1 *Workplace Health and Safety*, which provides information on job safety analysis and incident reporting processes, and a risk assessment and mitigation matrix for each phase of OWR activity.

The following hazards have been assessed as "high risk" for personnel undertaking wildlife intake activities:

- exposure to oil pollutants and contaminants
- stress, fatigue and burnout
- physical injury – animal bites, scratches and stab wounds
- physical injury – needle sticks, lacerations
- exposure to hazardous chemicals

See G-1 *Workplace Health and Safety* for the full risk assessment of wildlife intake activities.

3. Equipment and Facilities

3.1 Post mortem facility

The post mortem facility is set up within the "hot zone" (areas where oiled materials are present) of the facility. See G-6 *Setting up a primary care facility* for details of facility requirements.

3.2 Equipment

See Appendix A of the WA Oiled Wildlife Response Plan for equipment checklists.

4. Procedures

4.1 Carcass collection and field processing

Avoid contact of the carcass with petrochemical products until after oil samples have been collected. <u>This includes plastics such as plastic bags and gloves</u>. Procedures for collection, storage and documentation of oiled dead bodies are in P-4 of this Manual.

4.2 Intake records: identification and log

All dead bodies brought in from the field should be entered in the admissions log F4-2 by the intake admissions team (see P-5i of this Manual) and where possible have photographic and oil sample evidence collected.

If an animal dies after admission, this should be recorded on the admissions log, and the circumstances of its death should be entered on its clinical record (F4-3).

4.3 Chain of custody (CoC) documentation and evidence security

A strict framework of handling is required to ensure that evidence gathered from wildlife samples are suitable for use in a court of law. A CoC form should always accompany each animal or sample. F4-1 is used for CoC of animals and animal bodies; F5-1 should be used for CoC of oil samples.

4.4 Carcass storage

Necropsy should be conducted as soon as possible after death. If necropsy is not going to commence immediately, the carcass should be chilled, but not frozen, unless there is a delay of more than 24 hours until examination (see Figure P-5ii-1).

If a mortality is very high (hundreds of animals), necropsy should be performed on around 10% of bodies, ensuring representation of recently dead animals and the full range of ages, species and sex.

If a carcass is to be frozen for future evidence collection, it should be wrapped in aluminium foil so that no part of it is visible. The foil-wrapped carcass is then placed in the smallest possible paper bag, sealed securely with evidence tape, and sealed in a ziplock bag. Label L5-4 *Wildlife Intake - animal tissue sample* should be completed and fixed to the paper bag and ziplock bag.

4.5 Processing: photographic evidence (after Stacy et al 2019 and OWCN 2014)

Each dead animal is carefully photo-documented as follows:
A photo label is filled out for each animal (*L5-3 Wildlife Intake – photo evidence dead animal*) for inclusion in the first photograph, to clearly demarcate the photographic series for each case. Position the animal so that the oil is visible, the label is clear (to enable matching up with oil samples later), and the species can be identified (if possible). Take the photo as close as possible without excluding these vital components. Confirm the photo is acceptable before proceeding.

Once a picture has been taken it must remain on the memory card and cannot be modified in any way (this includes erasing and downloading images from the card to a computer). **No photograph should be deleted from a memory card.** Have spare memory cards available and label all used memory cards by placing in an envelope labelled with a *L5-5 Wildlife intake – photo memory card evidence* label. Place the label over the envelope seal to prevent tampering and attach chain of custody documentation. Secure the camera and memory cards in a locked evidence cabinet.

4.6 Processing: oil sample evidence

Oil sampling and evidence handling processes are adapted from Stacy et al (2019), Ziccardi et al (2015) and Oiled Wildlife Care Network (2014), in consultation with WA ChemCentre.

External oil sampling of dead animals is undertaken as described for live animals in P-5i of this Manual. Internal tissue and fluid samples may also be useful for petrochemical analysis but should only be sampled if the animal is freshly dead (<24h). To prevent cross-contamination, ideally use clean instruments and gloves for each tissue or fluid that is collected for petrochemical analysis. Instruments should be thoroughly cleaned with detergent followed by an alcohol rinse between individuals. Contact of the sample with plastic products, including nitrile gloves and plastic bags, instruments, or the insides of lids and containers should be avoided. The minimum tissue sample size for petrochemical analysis is 50g of tissue or 5ml fluids.

Samples can either be collected in certified contaminant-free glass jars or aluminium foil pouches (solid samples only) placed into plastic bags. The procedures for collection, handling, storage and recording of oil sample evidence are detailed in P-5i of this Manual. A checklist for petrochemical analysis sample collection is included on the necropsy forms (F5-2 a-f), which should be used to record the necropsy process and sampling for each dead animal processed.

Note that marine mammals (aside from fur seals) are far less likely to succumb to external oil pollution but may have significant internal exposure (from ingestion or respiration) and associated damage without external signs. A full internal examination may provide the only means to determine whether those animals found dead in the environment were exposed.

4.7 Processing: necropsy

As well as external oil sample collection and photographs, external examination and morphometric information should be undertaken before opening the carcass. Taxon-appropriate morphometric measurement instructions are included on the necropsy template forms F5-2 a-f *Wildlife Intake – necropsy forms*.

Where possible, internal necropsy should be undertaken by experienced veterinary personnel. All findings must be carefully recorded on the necropsy form.

4.8 Carcass disposal

Disposal of the body after examination must be undertaken as directed and may vary depending on the circumstances. Possible modes of disposal include freezing for future analysis, burial, incineration or commercial disposal. <u>Under no circumstances</u> should carcasses be fed to other animals.

The mode of disposal of the carcass after examination should be recorded on the animal's clinical record (F4-3). Animal deaths must also be recorded on the facility's admissions log (F4-2).

P6 OWR PROCEDURE: PHASE 6 WILDLIFE CLEANING

Responsible personnel: Cleaning team

Recording requirements:

Forms:
06-1 Wildlife Cleaning – cleaning room record

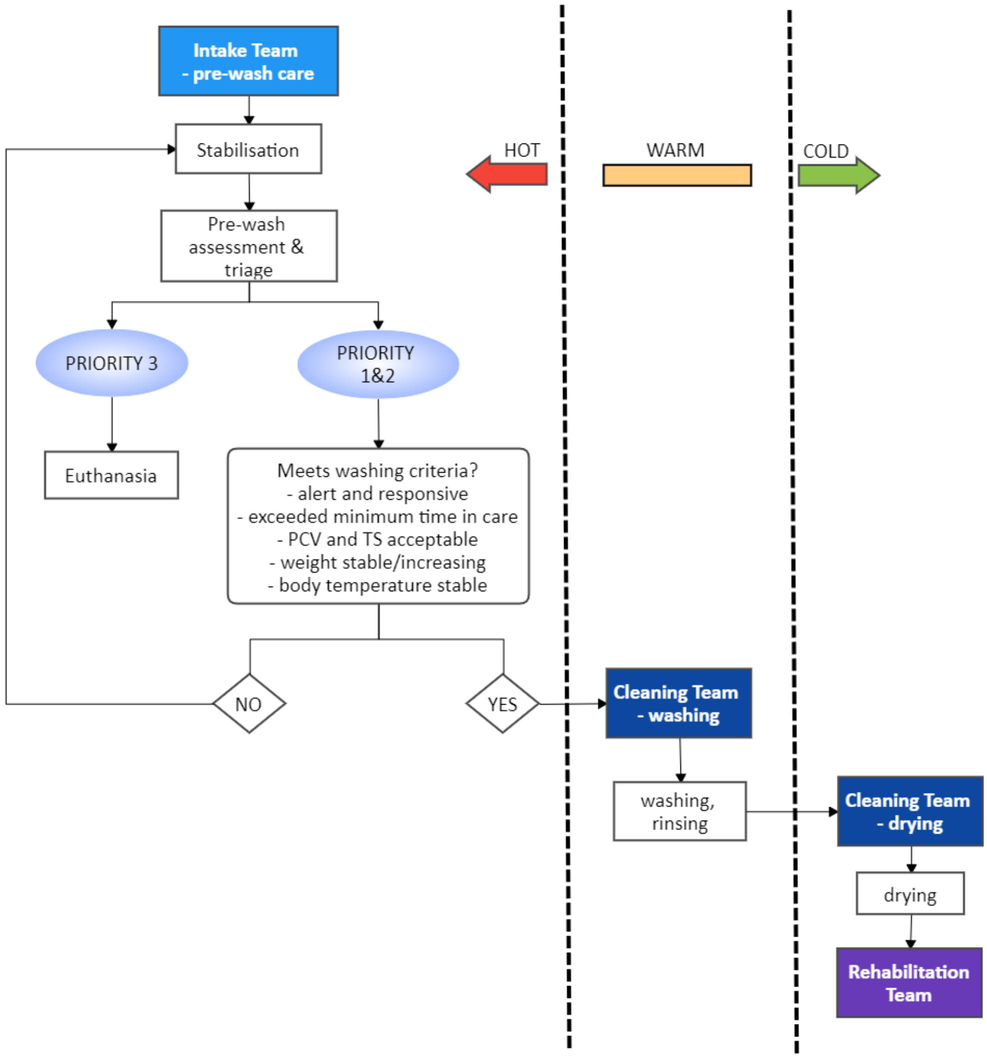


Figure P-6- 1 Work flow: Phase 6 Cleaning

1. Purpose and Scope

Washing animals is required in the wildlife response to an oil pollution event to remove oil from the external surfaces of the affected animal. Washing, rinsing and drying is very stressful and must be carried out in a careful manner to keep stress to a minimum. All animals must undergo pre-wash care and meet pre-wash health criteria to ensure they are able to withstand the washing process.

This procedure assists personnel involved in the cleaning wildlife once they have received initial triage and first aid and have been stabilised.

2. Human Safety

All Wildlife Unit personnel should be familiar with G-1 *Workplace Health and Safety*, which provides information on job safety analysis and incident reporting processes, and a risk assessment and mitigation matrix for each phase of OWR activity.

The following hazards have been assessed as "high risk" for personnel undertaking wildlife cleaning activities:

- exposure to oil pollutants and contaminants
- stress, fatigue and burnout
- physical injury – slips, trips and falls
- physical injury – animal bites, scratches, stab wounds

See G-1 *Workplace Health and Safety* for the full risk assessment of wildlife cleaning activities.

3. Equipment and Facilities

3.1 Facility setup

Washing facilities are designated as a "warm zone" (transitional area where oiled materials are removed). Drying facilities are within the "cold zone" where oil is no longer present.

G-6 *Setting up a primary care facility* outlines infrastructure specifications for the establishment of self-contained mobile oiled wildlife washing units, as well as designs for general washing and drying facilities. The availability of electricity, appropriate water conditions (pressure, volume, temperature and hardness), and pool/pen capacity will determine the number and types of animals which can realistically be cleaned.

Waste water from cleaning will contain oil, dirt and detergent. It must be disposed of according to the incident's waste management plan. Any oil contaminated water, towels or PPE are to be collected and disposed of in accordance with the instructions of the Waste Disposal Unit.

3.2 Equipment

See Appendix A of the WA Oiled Wildlife Response Plan for equipment checklists.

4. Wildlife Cleaning Activities

4.1 Pre-wash evaluation

Animals which have been in pre-wash care for the prerequisite minimum time (48 hours for birds, 24 hours for mammals) are evaluated regularly to determine if they meet wash criteria (Table P-6-1). The pre-wash care team will develop a daily list of animals which are ready for cleaning.

Table P-6- 1 Health criteria which must be met to qualify for cleaning

Criterion	Birds	Mammals	Reptiles
Demeanour	Alert and responsive		
Time in stabilisation	48 hours	24 hours <u>or</u> medically stable enough to withstand anaesthesia for at least 2 hours (unless small enough for manual restraint)	case by case
Body temperature	38-41°C	36-38°C (pinnipeds)	stable
Weight	Stable or increasing; adequate for the species		
Blood parameters	PCV >30% TP > 25g/L	PCV and TP close to the normal range within 24-48h of proposed clean. PCV and TP normal or approaching normal	
Other		Do not feed within 2 hours of washing	

**<u>Note re marine mammals</u>*: With the exceptions of fur seals and pinniped pups of all species, pinnipeds and cetaceans are protected from the hypothermic effects of oiling by their blubber and in fact can become hyperthermic when washed. For washing to be indicated for a marine mammal, the following additional criteria must be met:

- Fur seals and pinniped pups of all species: significant oiling present and/or loss of waterproofing in any area larger than a lemon
- Other pinnipeds: oil is significantly impairing normal function.
- All pinnipeds and cetaceans: appropriate rehabilitation facilities are available to care for them appropriately in a captive environment.
- See P-3 of this Manual for decision-making flow charts for intervention with marine mammals during an oiling event.

<u>Note re venomous and dangerous reptiles</u>: Rescuing oiled crocodiles and venomous snakes (e.g. sea snakes) for cleaning should only occur if expert, authorised personnel are always available for handling, <u>and</u> a facility is available that can house and care for them safely.

4.2 Pre-treatment

In certain circumstances where there is stubborn, very weathered/hardened or tarry oil, pre-treatment using mild emulsifying agents may be required. Agents which have been successfully used for pre-treatment include canola oil, methyl soyate, methyl oleate, olive oil and mayonnaise (the latter is not recommended for birds). The warmed (35°C) agent is applied to the affected area, working it into the feathers/fur/skin, then leaving in place for up to 30 minutes or until the tar loosens and can be wiped off with an absorptive pad or towel.

Pre-treatment agents are contaminants which will have to be removed in the cleaning process; therefore <u>they should only be applied when absolutely necessary, using only the minimum amount necessary</u>. The animal's body temperature should be monitored carefully during the pre-treatment phase to avoid hypo- or hyperthermia, and stress minimised as much as possible by keeping the animal in a quiet, dark environment while the emulsifier is acting.

Clipping away tar patches in pinnipeds is not recommended unless moult is imminent, or the patches are small, due to the risk that the bald patch will negatively impact thermoregulation. This is especially important for fur seals, and for juvenile pinnipeds of any species.

4.3 Washing

4.3.1 General Principles

Although there are some species specificities in water requirements for cleaning different taxa (Table P-6-2), the following general principles apply to washing all species:

- water should be within the high end of normal body temperature range for maximum cleaning efficiency and to prevent hypothermia;
- handling techniques should reflect the size, strength, fragility, and ability to inflict injury to humans of each species;
- if sedation or anaesthesia is required, this must be undertaken and monitored by veterinary personnel. Inhalational anaesthesia is not recommended in mammals covered in fresh oil, due to the risk of recently sequestered hydrocarbons becoming re-mobilised. Injectable anaesthetic agents should only be given as a single dose and not used for supplementary anaesthesia;
- clipping of fur or feathers is not recommended as it will interfere with waterproofing and thermoregulation, and delay release;

- **prolonged washing time decreases survival rate**. The washing process should be long enough to completely remove contaminants but as short as possible to limit stress. Stress should be monitored carefully, and cleaning should be suspended if signs of stress are seen. These may include gasping, excessive heavy breathing, or a sudden change in demeanour (sudden panic, sudden lethargy);
- use a systematic approach to ensure no body area is missed or not completely cleaned. Any retained oil will impair waterproofing and thermoregulation;
- if using washing tubs, immerse the entire body (except head and neck) to maximise cleaning efficiency and maintain warmth. Transfer to a clean tub when the water becomes oily or the detergent loses efficiency;
- to reduce stress, keep the animal in a normal posture and work quietly;
- for safety and stress minimisation, only required personnel should be present.

Dishwashing detergent is used as the cleaning agent for oiled wildlife. Many detergent products have been trialled; the most effective to date is original Blue Dawn Ultra® (Procter & Gamble). This product is not generally available in Australia (available Dawn® products are not as effective) but an Australian supply has been established specifically for OWR through a nationally-coordinated initiative and the product is now part of the DBCA stockpile. Other products which have been used with less success but are readily available in Australia are Fairy® and Palmolive Ultra®. The concentration of detergent required varies with taxon as shown in Table P-6-2.

Table P-6- 2 Summary of requirements for washing different taxa

Criterion	Birds	Mammals	Reptiles
Temperature	39-40°C	37°C	27-29 (within 2°C of body temperature)
Hardness	30-50mg/L $CaCO^3$ (35-85ppm)		
Pressure	280-420KPA (40-60psi)		
Detergent %*	1-2%	At least 4% At least 5% for fur seals	1-2%
* increased concentrations may be needed for certain types of oil and harder water			

4.3.2 Washing preparation and documentation

All necessary equipment and supplies, including detergent and tubs, should be prepared prior to beginning a wash. Have three to four tubs ready and filled with water at the appropriate temperature and the appropriate concentration of detergent beforehand. The water temperature should be monitored throughout, and never allowed to fall below the required temperature.

Records of washing should be documented using F6-1 *Oiled wildlife cleaning room record.*

4.3.3 Washing birds

Cleaning a bird generally requires two people: a handler and a washer. Washing a bird typically takes 10-30 minutes depending on the extent and type of oil, species of bird and proficiency of the wash team, but may take as long as 60 minutes in some cases.

Immerse the bird, except for its head which should be kept with the bill pointing downwards slightly, to keep water from running into the nares. Wherever possible, the handler should keep the eyes shielded to reduce visual stimulation and exposure to detergent. If detergent gets into the bird's eyes during cleaning, they should be washed, and artificial tears applied.

When transferring between tubs, the handler should maintain a firm hold on the head while the washer moves the body.

The art of washing is achieving the right balance between aggressive feather cleaning and gentle feather handling. Use a slightly cupped hand with fingers spread to agitate the detergent solution through the feathers. The goal is to maximize the exposure of the feathers to detergent solution. In general, avoid scrubbing the feathers as this can damage their delicate microscopic structure. The large primary, secondary, and tail feathers are cleaned by running the fingers along the length of the feather in the direction of growth to separate the feathers and allow contact with the solution.

A standard process should be followed to ensure that all areas are washed:

- use cotton buds to remove oil in the nostrils and inside the bill;
- clean the head gently, flooding the feathers with solution then using a soft toothbrush or foam swab to lift and separate the feathers. Repeat until the head is clean;
- check interior of the mouth for oil and clean with gauze or a cotton swab if necessary;
- roll the bird to one side and then the other to clean the wing and flank on each side, paying special attention to the axillary and inguinal areas;
- lift the bird up to wash the areas from its breast down to the underside of its tail feathers.

When the water becomes oily, excess water is gently squeezed out of the feathers, over the rump, before the bird is moved to a new tub. Large, heavily oiled birds may require 8-10 tubs of water.

Once all oil has been removed (the wash water is no longer becoming discoloured, no oily residue is left on the water and the bird appears to be clean) the bird is ready for rinsing.

4.3.4 Washing mammals

Washing duration will depend on the extent and type of oil, the strength and species of the animal and the proficiency of the staff. Large or aggressive mammals, and those for which washing is labour-intensive (e.g. fur seals) will require sedation or anaesthesia for washing.

Avoid feeding mammals for 2-4 hours prior to the wash to minimise the chance of regurgitation due to stress or the effects of chemical restraint. Apply ophthalmic ointment to the eyes before washing to protect them from both oil and detergent.

Pinnipeds of all species can be susceptible to hyperthermia during washing and body temperature should be monitored carefully during washing. If hyperthermia occurs, switch to cooler water for washing and rinsing. Fur seals have a much denser fur coverage and cleaning is more labour-intensive in these species than in other pinnipeds.

As a rule for mammals, detergent at the appropriate concentration (at least 4%, but much higher concentrations may be required for certain oil types, densely furred species or for heavy oiling) is applied and rubbed on the fur until the oil is visibly removed, then rinsed off. Wash and rinse cycles are alternated until there is no indication of oil in the rinse water and no petroleum odour on the fur. Fur seals will require moderate pressure rinsing (30-40psi) due to the density of their fur. Washing will take 10-30 minutes for most mammals and 40-60 minutes for fur seals.

If the oil is not coming off despite using higher concentrations of detergent, use a pre-treatment agent to encourage removal (Section 4.2).

4.3.5 Washing reptiles

Depending on the size and strength of the reptile, a handler and a washer may be required to wash each individual. Soft scrub brushes, toothbrushes, cotton swabs and gauze are all helpful for removing oil from reptile skin folds and turtle shells.

Pay attention to the eyes and mouth when cleaning. Use cloth dampened with organic fats such as mayonnaise or vegetable oil to remove oil from the eyes and mouth. Check the animal's treatment record as this should already have been done during initial triage and treatment.

Turtles can be cleaned using a sponge held in long haemostats, pushed into the spaces between the shell and the head, legs and tail, and twisted and moved around as required, followed by irrigation with detergent solution using a water jet. Scrubbing with the sponge and irrigation with solution are repeated, as necessary.

4.4 Rinsing

4.4.1 General principles

Thorough rinsing is essential to remove detergent from the animal and to enable regaining of waterproofing. General principles for rinsing for all species are as follows:

- **prolonged rinsing decreases survival rate.** The rinsing process should be long enough to completely remove all detergent but short enough to limit stress. Rinsing birds generally takes 15-40 minutes.
- water temperature should not exceed the high end of normal body temperature range. Water pressure should be as high as possible (max 3.5 bar or 50psi) while minimising damage to feathers, fur and skin. Use decreased pressure for the head and vent areas. Water hardness of approximately 50ppm is ideal; water that is too soft may not wash detergent off adequately.
- do not spray water directly into orifices such as eyes, oral cavity or rectum/cloaca.
- keep the animal in a normal posture and work quietly.
- use a systematic process of rinsing and visual checks to ensure no areas of the body are missed. Start at the head and work down the neck, back, wings/forelegs, breast, abdomen and tail to keep pushing detergent off the animal in one direction.
- working surfaces, and the hands and clothes of the holder and washer must be free of detergent.

4.4.2 Additional species-specific guidelines

The rinsing process in birds may be started by placing the bird in a tub of clean water, and ladling clean water over it, moving it between tubs until no detergent residue is seen in the water before rinsing with a pressurised shower head. The nozzle should be held close to the body to flush the detergent outwards from the base of the feather. Rinse flight feathers in the direction of growth and contour feathers against the direction of growth. After a thorough rinsing, water should bead up and roll off the flight feathers, and the down feathers should fluff up and appear dry.

Fur seals require an additional 40-60 minutes of rinsing after washing, using a moderate pressure spray (30-40psi) until no oil is visible in rinse water and no petroleum odour is detectable on the fur. Rinsing of other pinnipeds can be started with the animal under restraint, but finished with the animal unrestrained in a pen, using a pressure nozzle. This reduces stress associated with handling. Rinsing should continue until no oil or detergent is visible in the rinse water coming off the animal. All pinnipeds have the potential to become hyperthermic with warm water rinsing and may require a reduction in water temperature if hyperthermia is observed.

4.5 Drying

Animals should be dried in a designated drying area in the "cold zone" following washing and thorough rinsing. Appropriate clean housing pens should be available, suitable to the size and species. Drying pens should be solid-bottomed and covered with clean absorbent material such as towels. A layer of netting should be considered as substrate for birds prone to foot pressure injuries.

Drying pens can be heated with heat lamps or hot air driers. Pens should be covered with sheets or towels to minimise visual disturbance.

The following principles should be observed:

- the drying area should be attended by experienced staff at all times, with frequent monitoring (every 15-30 minutes) to ensure hypothermia, hyperthermia and burns do not occur.

- the drying area should be well ventilated to reduce humidity and promote drying.

- temperature of the pens should be monitored at all times and should be appropriate for maintaining normal body temperatures and encouraging normal preening/grooming behaviours. A temperature of 32-35°C will be appropriate for promoting preening and movement in most birds.

- drying can be passive (left to dry over time) or active (towel drying, use of electrical driers or heating lamps). In most cases, drying will begin with some initial manual towel drying. *Reptiles* generally will not require any further drying. Most *pinnipeds* can also be placed directly in their outdoor pens to dry, although fur seals and unweaned pups, which depend on their coat for thermoregulation, may need active indoor drying using <u>cool</u> air blowers. *Birds* are generally best dried actively unless the weather is very still and warm.

- driers and heat lamps should be placed at sufficient distance to avoid animal contact and should have space for the animal to move away if it is overheating.

- drying time is highly variable. Small birds can dry in as little as 30 minutes, but larger birds which are not preening may take several hours to dry.

- animals should remain in drying pens until they are completely dry.

P7 OWR PROCEDURE: PHASE 7 REHABILITATION

Responsible personnel: Rehabilitation Team

Recording requirements:

Forms:

F7-1	Wildlife Rehabilitation – daily progress record
F7-2	Wildlife Rehabilitation – pool observation record
F7-3	Wildlife Rehabilitation – waterproofing record
F7-4	Wildlife Rehabilitation – daily rounds and laboratory record

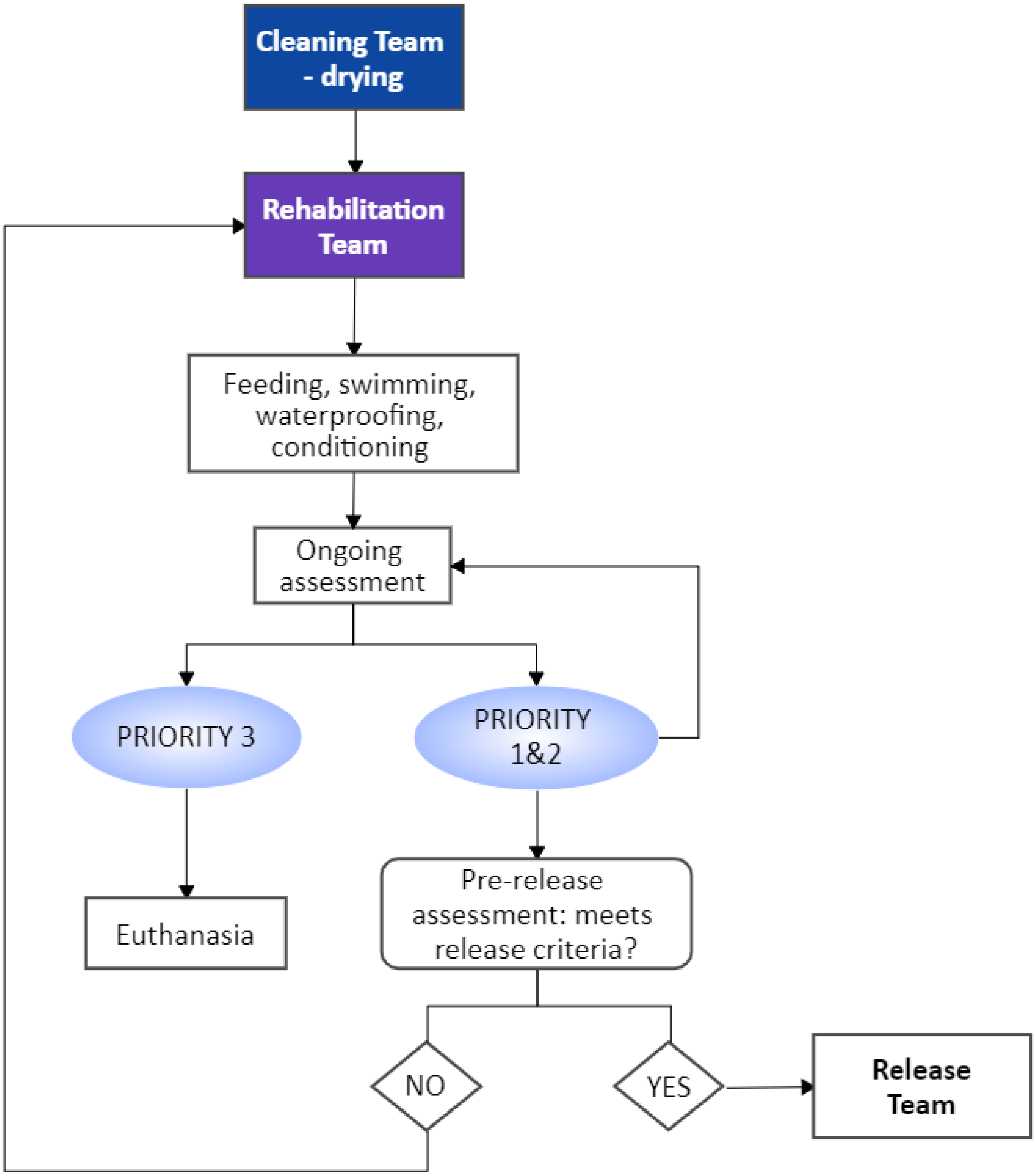


Figure P-7- 1: Wildlife Rehabilitation

1. Purpose and Scope

Rehabilitation of wildlife which has been cleaned or pre-emptively brought into captivity after a marine oil pollution event is a highly specialised task. The many variables involved cannot be covered in a single procedure, but this section provides references, broad guidelines and principles, and highlights rehabilitation issues specific to OWR.

At all times, decisions on the housing, feeding, husbandry and captive management of wildlife should be guided by experts in wildlife rehabilitation and wildlife veterinary practices.

2. Human Safety

All Wildlife Unit personnel should be familiar with G-1 *Workplace Health and Safety*, which provides information on job safety analysis and incident reporting processes, and a risk assessment and mitigation matrix for each phase of OWR activity.

The following hazards have been assessed as "high risk" for personnel undertaking wildlife rehabilitation activities:

- stress, fatigue and burnout
- physical injury – slips, trips and falls
- physical injury – animal bites, scratches, stab wounds
- physical injury – needle sticks, lacerations

See G-1 *Workplace Health and Safety* for the full risk assessment of wildlife rehabilitation activities.

3. Equipment and Facilities

Rehabilitation facilities will consist of pools, indoor housing and outdoor housing. The specifics will be highly dependent on the species being cared for and the location and circumstances of the spill. Further detail and references are in G-6 *Setting up a primary care facility*.

See Appendix A of the WA Oiled Wildlife Response Plan for equipment checklists.

4. Wildlife Rehabilitation Activities

4.1 Hygiene and cleaning

High levels of hygiene and biosecurity, as well as appropriate use of PPE, are cornerstones of good rehabilitation management. See G-2 *Biosecurity in an oiled wildlife response* and Appendix A-6 *Cleaning and disinfection* for further details.

Remember the rehabilitation area is free of oil contamination ("cold"). Keep all materials used in rehabilitation separate from "hot" and "warm" oiled areas.

4.2 Feeding

All animals should receive high quality, species-appropriate food which is presented in the appropriate manner. Guidelines G-5 *Fluid therapy and nutritional support* and Appendix A-5 *Rehabilitation diets for selected species* give guidance, but participants should defer to the experience of rehabilitators with local knowledge of species, products and supply chains.

4.3 Housing

G-6 *Setting up a primary care facility for oiled wildlife* contains preliminary information on space and building requirements for housing, but the advice of local rehabilitation experts is essential. For more detailed information, see the following texts:

Birds: Fiorello et al (2014). OWCN Protocols for the Care of Oil-affected Birds, 3rd Edition.
https://owcnblog.wordpress.com/2014/05/28/owcn-avian-care-protocols-available/

Turtles: Bluvias and Eckert (2010) Marine turtle trauma response procedures: a husbandry manual.
https://www.widecast.org/Resources/Docs/Bluvias_and_Eckert_Sea_Turtle_Husbandry_Manual_2010.pdf

Marine mammals: Ziccardi M et al. 2015. Pinniped and Cetacean Oil Spill Response Guidelines.
https://www.fisheries.noaa.gov/resource/document/pinniped-and-cetacean-oil-spill-response-guidelines

4.4 Waterproofing

The waterproofing status of seabirds in rehabilitation must be assessed regularly. Form F7-3 *Waterproofing record* can be used for recording waterproofing observations.

Birds are placed in a clean swimming pool of water that tests at 30-50 mg of calcium carbonate per litre (water softeners may need to be installed on taps to achieve this) and observed/examined closely for signs that water is reaching the skin.

Birds may not be fully waterproof if:

- they sit lower in the water than normal (*but see Note);
- they droop their tail into the water;
- they repeatedly attempt to leave the water;
- they appear wet (*but see Note);
- they shiver;
- they show excessive preening;
- water does not 'bead' off the feathers;
- down feathers are wet.

* Note: unlike other diving birds, cormorants and darters have feathers which are partially "wettable", which is why they stand with wings spread after diving to dry their feathers. The outer area of the feather is the part that becomes waterlogged, so surface wetness cannot be used as an indicator of waterproofing. They also normally sit very low in the water. In these species a recommended indication of waterproofing is to ensure there are no areas where the bird is "wet to the skin", as the central core of the feather should be very resistant to water penetration.

Birds that are waterproof may be moved to outside housing. Birds that are not waterproof need re-evaluation or must be housed on warm water pools. It can take up to 10 days for washed birds such as pelicans to regain their waterproofing.

4.5 Salting

Salt glands are present in many marine species which drink sea water, to assist them in excreting excess salt safely. Salt glands are present in all Procellariformes ("pelagic") bird species (albatrosses, petrels, shearwaters, fulmars, jaegars, skuas), as well as penguins, pelicans, cormorants and sea turtles. These species are best housed in salt water, although pelicans and cormorants adjust readily to fresh water without salt supplementation, as do penguins for a limited time (<2 weeks). Pelagic species which have been maintained on fresh water for more than ten days will require the re-establishment of salt gland function by adding salt to their diet for at least 2 weeks prior to release. Some sandpiper species which inhabit hypersaline lakes may also benefit from salt supplementation.

Salt may be supplied to self-feeding birds by dosing food with salt tablets (see Appendix A-4 *Formulary*). If gavage feeding is being used, a 1% salt solution may be added at maintenance fluid rates to the formula, increasing over several days to 3% prior to release. See Appendix A-3 *Standard preventative care for selected bird taxa* for a guide to taxon-specific salt requirements.

Sea turtles should be housed in salt water for rehabilitation (after initial rehydration in fresh water – see G-5 *Fluid therapy and nutritional support*), and do not generally receive dietary salt. Once hydrated, a gradual conversion to salt water should occur (25% transition per day over 4 days).

4.6 Veterinary and rehabilitator assessment

Animals' progress should be monitored through observation, regular weighing and physical examination. Examination frequency should balance the benefits of evaluation against the stress of handling; generally every 2-4 days will be appropriate for birds once they have been cleaned.

A handling event should combine as many processes as possible to reduce the requirement for repeated handling. For example, if gavage feeding, it may be appropriate to weigh and collect blood before feeding. Check for injuries, pressure sores to feet/keels, hydration status, attitude and regurgitation at all handling events.

Form F7-1 *Daily progress record* is used to record all aspects of gavage feeding, medication and assessment. Refer to the back page of the individual's clinical record (F4-3) for details of its medical prescriptions. To prevent transcription errors, the daily progress record only records that the medication was given, rather than the full prescription.

For ease of undertaking daily "rounds", it may be more efficient to use Form F7-4 *Daily rounds and laboratory record* to record information on all animals examined during the round, and then transfer this information to individual F7-1 sheets later.

Form F7-2 *Pool observation record* is used to record observations of animals in communal pools. This information is transferred to the daily progress record for each individual as required.

Blood testing and other biometrics will determine when individuals are ready for release. Blood sampling must be documented carefully to ensure there is no confusion of samples. Use F7-4 *Daily exam and bleed record* to document as samples are taken. Samples should be processed promptly so results can be incorporated into the individual's assessment as soon as possible. PCV and TP are assessed every 2-3 days.

The triage and clinical assessment process outlined in P-5i of this Manual should be used when assessing the progress, priority and likelihood of recovery of animals in rehabilitation.

4.7 Medications

Very few pharmaceuticals are routinely used during OWR rehabilitation. The most common is the use of antifungals for birds susceptible to aspergillosis. Appendix A-3 *Standard preventative care for selected bird taxa* lists the species most likely to require preventative antifungal therapy.

Appendix A-4 *Formulary* lists doses for commonly used medications. Other therapeutics not in the formulary may be prescribed by veterinarians. All medication should be under veterinary supervision. Prescription and administration on are recorded on 07-1 *Wildlife rehabilitation – daily progress record.*

4.8 Progressing to release

Daily briefings between the cleaning, rehabilitation and release teams are necessary to communicate flow of patients and ensure animals are released as soon as they are fit. P-8 of this Manual outlines the criteria for fitness for release, and considerations for a successful release.

P8 OWR PROCEDURE: PHASE 8 RELEASE

Responsible personnel: Release Team

Recording requirements:

Forms:

F4-2	Oiled wildlife admission log
F4-3	Oiled wildlife live animal assessment
F7-1	Daily progress record

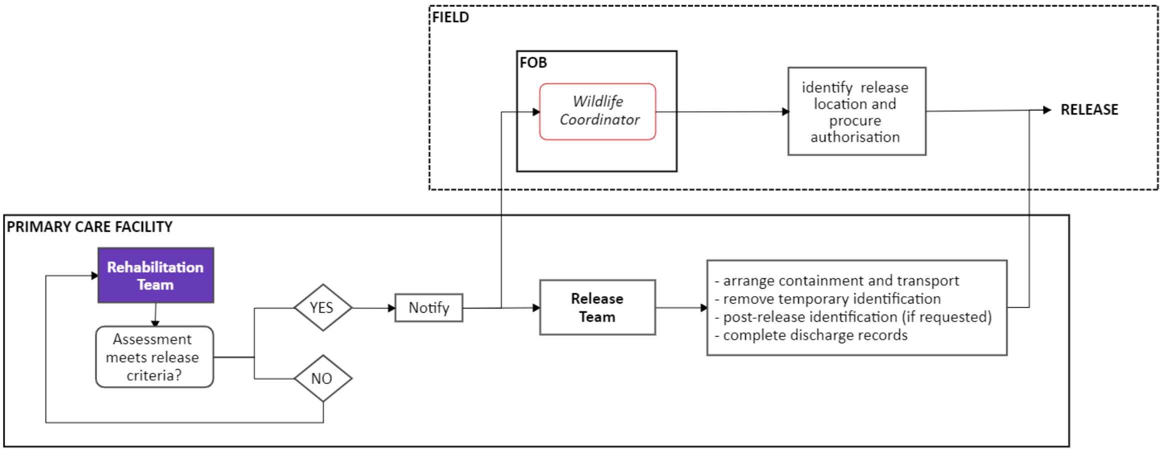


Figure P-8- 1 Work flow: wildlife release

1. Purpose and Scope

An objective of the OWR is to release fully fit, rehabilitated animals back to a safe, clean natural environment. Release must occur in coordination with the overall incident response, with appropriate planning and authorisation. This procedure outlines the considerations and processes for the release of oiled wildlife after cleaning and rehabilitation.

2. Human Safety

All Wildlife Unit personnel should be familiar with G-1 *Workplace Health and Safety*, which provides information on job safety analysis and incident reporting processes, and a risk assessment and mitigation matrix for each phase of OWR activity.

No hazards have been assessed as “high risk” for personnel undertaking wildlife release activities. The following hazards have been assessed as “moderate risk”:

- environmental exposure (dehydration, hypo/hyperthermia, sunburn, heat exhaustion)
- physical injury – slips, trips and falls
- physical injury – vehicle strike or mishap (including drowning)
- physical injury – animal bites, scratches, stab wounds
- venomous animal bites and stings

See G-1 *Workplace Health and Safety* for the full risk assessment.

3. Criteria for release of wildlife

To be assessed as fit for release, an animal must meet the following criteria (adapted from OWCN 2014; Stacy et al 2019; Shigenaka et al 2010):

- demonstrates normal, species appropriate **behaviour** (feeding, swimming, diving, flying, grooming, interacting with others);
- **weight is close to normal** for a wild individual of its species (with consideration for age, sex, life stage and time of year). As a rule of thumb, the animal's weight should be at least within 10% of the lower range of normal;
- where monitored, **blood values** are compatible with good health and stable clinical status (See Table P-5i-1 for more information);
- has a stable core **body temperature** (birds and mammals); birds not in a stage of moult which will interfere with thermoregulation;
- specific **clinically diagnosed problems have resolved** (e.g. wounds sufficiently healed)
- has been **off all medication** (other than nutritional supplements) for the minimum period stipulated by veterinarians;
- any specifically requested **diagnostic testing or disease screening** has been undertaken, with acceptable results as judged by a veterinarian;
- if dependent on feathers or fur for insulation demonstrates complete **waterproofing;**
- if a sea turtle or pelagic bird: proper function of **salt glands** has been confirmed;
- if a moulting species: sufficiently **completed moult;**
- is fully **acclimatised** to outdoor temperatures and to the weather conditions it will experience on release.

Team leaders should further refine these criteria to establish specific release requirements for the species in their care. Animals which do not meet the criteria must NOT be released and should be managed according to the triage process and G-4 *Euthanasia Plan.* Refer also to DBCA *Wildlife Rehabilitation Guidelines: making decisions on the fate of rehabilitated fauna*.

4. Pre-release assessment

All animals thought to be ready for release require a full pre-release assessment examination, preferably by a veterinarian. The examiner should ensure the lungs are clear, that all wounds and burns have healed sufficiently, and (if relevant to the species) that moulting is not interfering with the animal's ability to thermoregulate or flee from predators.

Species that depend on their feathers or fur for insulation must also be confirmed to have fully regained waterproofing ability. A pelagic bird species should be able to demonstrate complete waterproofing after a minimum of 24 hours in an unheated, hard-water pool without a haulout, to be considered fit for release. Diving birds must remain waterproof after extended time in a deep pool where they can demonstrate the ability to remain waterproof when under water.

Birds with salt glands that have been housed in fresh water may need to be placed in salt supplemented water, or dosed with salt water or salt tablets, for two weeks prior to release to re-establish their salt tolerance (see Appendix A-3 *Standard preventative care for selected bird taxa* for susceptible species and A-4 *Formulary* for supplementation doses). Any increase in exposure to salt should occur gradually over several days, and birds must be monitored to ensure no signs of salt toxicity are seen. Salt gland function is demonstrated by the presence of nasal salt gland secretions running down the bill below the nares or tubes. In birds with internal nares, the secretion runs down the inside of the bill from the roof of the mouth and these birds can be observed shaking their heads to excrete the salt solution. This tends to occur about 30 minutes after feeding.

Although sea turtles are typically housed in salt water for rehabilitation, salt gland function may be impaired by oil exposure, ill health or chronic dehydration. Pre-release assessment of sea turtles include eye examination to ensure normal watery eye secretion and normal corneal health. Blood electrolyte levels may also assist in confirming normal salt gland function in these species.

5. Planning considerations

5.1 Authorisation

No release should be undertaken without the knowledge and endorsement of the IMT, as it is essential to formally confirm the safety and pollution status of the proposed release environment. The Wildlife Coordinator will communicate the readiness of wildlife for release to the IMT.

Under the *Biodiversity Conservation Act* 2016, a person must not release fauna in any part of WA unless they have lawful authority to do so. This authorisation must be obtained prior to release.

5.2 Biosecurity

Screening for diseases of local or regional concern may be recommended by veterinarians prior to release to prevent the introduction or spread of diseases to wild populations. This consideration should be incorporated into pre-release criteria specific to the incident.

5.3 Timing

Ideally, animals should be released as soon as they are deemed fit. However, it is essential that environmental conditions are amenable to successful release (see below). Delaying release until acceptable environmental recovery must be balanced against the risk of secondary problems developing if animals are retained in care for too long.

The time of day for release will depend on the normal habits of the species, the weather conditions and the tides. Release time should give the animals a chance to orient themselves, forage and find safety before their normal resting period. The timing of release will be finalised by the Wildlife Coordinator, in consultation with the IMT, veterinary staff and rehabilitation experts, using a risk management approach.

Where it does not compromise the success of the venture, releases should be coordinated to enable coverage by media. This generates positive exposure of the OWR effort and enables acknowledgement of all participants in the response.

5.4 Environmental requirements

In consultation with DBCA, the IMT will determine the most appropriate release sites. Selected release sites should be:
- free of ongoing oil contamination;
- close to the site of rescue, if appropriate and available;
- chosen with consideration to resident and migratory species needs;
- within a reasonable transport distance;
- within the normal geographic or physical distribution range of the species;
- capable of providing appropriate habitat and readily available food;
- protected from undue disturbance and predator access.

6. Pre-release identification and marking

The marking of free-ranging wildlife is a scientific monitoring process. Marking must only be undertaken as part of an approved research project and under the appropriate licence. Examples of marking which may be undertaken include:

Temporary identification: methods such as paint, stencil, colour coding and hair clipping can be useful for monitoring animals close to where they were found and may be more visible than some permanent methods. However, it is important to consider the effects they may have on normal behaviour, socialisation, and on thermoregulation (in the case of hair removal).

Auxiliary markers such as plastic colour bands or plastic flipper tags can be used for identifying animals remaining close to land which do not migrate. This is not usually cost effective or practical for large-scale follow-up but may provide valuable information for species such as shore birds.

Permanent markers such as metal bands, rings and tags are relatively simple and low cost, but yield a low return because they cannot be monitored remotely. Likewise, transponder tags (microchips) are generally only useful if animals are likely to be found and scanned later. This may have utility for certain situations, such as female sea turtles which have a high nesting site fidelity.

Telemetry devices such as VHF, GPS and satellite tags offer a relatively high cost option but enable remote collection of data for variable periods of time – up to months or years in some cases.

7. Records

The release team should ensure completion of the following records:

F4-2 *Admission log*: complete final columns on release using the information on F4-3
F4-3 *Live animal assessment*: complete disposition details and enter final prescription dates
F7-1 *Daily progress record*: finalise any outstanding information

Any temporary banding or identification devices used during the response should be removed before release. Details of identification applied prior to release should be entered on the Disposition section of F4-3 *Live animal assessment.*

8. Transport

Once the release arrangements are finalised, transportation and access to the site must be undertaken in consultation with the IMT if the MEE response is ongoing, or with DBCA otherwise. Section 4.6 of P-4 of this Manual should be followed for transport of animals to the release site.

9. Release Techniques

Different species will have differing requirements for their site of release; for example, some seabird species can be released from a beach while others require release from seaside cliffs which provide an updraft. Some species are best released in groups, while others do well when released individually. Rehabilitation experts should be consulted on these particulars in planning the exact siting and process for release. The release should occur with minimal human disturbance and noise, and with the minimum of handling, preferably under the direction of rehabilitators with experience in the release of that species.

WA OWR MANUAL

SECTION 2: GUIDELINES

G-1: WORKPLACE HEALTH & SAFETY

1. Purpose and scope

Working with wildlife in an oil-polluted environment carries human safety risks. All personnel must understand the health and safety risks of OWR and use the appropriate control measures.

This document outlines the framework of safety management within the overall response, details the risks to wildlife responders and summarises the risk mitigation processes to be undertaken. The risk management process is aligned with the DBCA Standard Operating Procedure *Risk Management, Job Safety Analyses and Pre-start Checks.*

2. Safety in the IMT

Human safety within the DoT IMT framework is managed by the Safety Officer. A Safety Coordinator is appointed for oversight and implementation of workplace health and safety requirements across all operations. The Safety Coordinator will request a nomination from the Wildlife Unit to act as a safety representative for the wildlife response.

Safe working protocols are developed for each working area or task through adherence to standard operating procedures, and by undertaking job safety analysis for non-standard tasks.

Personnel will be made aware of safe working practices and SOPs during induction, including:

- compliance with workplace safety legislation
- understanding and interpreting Material Safety Data Sheets
- safe and appropriate use of PPE
- understanding the specific hazards of the task at hand
- how to report hazardous incidents
- where medical assistance can be obtained.

3. OWR hazard summary

This section provides details on the hazards identified for risk management in undertaking the eight phases of oiled wildlife response.

3.1 Oil exposure hazards

Personnel working with oiled wildlife are at risk of exposure to oil pollutants. Be aware of the possibility of exposure via contact, inhalation or ingestion. Wear appropriate PPE at all times, as directed. Remove all oil-contaminated PPE in designated areas and undertake decontamination before eating, drinking or smoking. Maintain adequate ventilation in areas where oiled wildlife is located (including transport vehicles).

3.2 Environmental exposure risks

Personnel can be affected by dehydration, sunburn, hyperthermia and hypothermia during a response. Taking breaks, drinking water regularly, and using protective clothing and sunscreen are all necessary to remaining safe from these risks. All personnel should self-monitor for symptoms of excessive exposure to heat or cold.

3.3 Stress, fatigue and burnout

Involvement in an OWR is physically and mentally stressful, and emotionally draining. Working with large numbers of sick and injured animals can be very distressing. It is essential that staff take regular breaks to avoid burnout and that they seek support through a safety representative if suffering from mental or emotional stress. All workers should be alert for signs of fatigue and stress in themselves and in other workers, and act to address these or seek support promptly.

3.4 Physical injury hazards

3.4.1 Slips, trips and falls

Maintain an awareness of field conditions and hazards (terrain, climate etc.) to prevent slips, trips and falls. This includes the awareness of the additional risks of working at night. Avoid relying on unstable terrain to support body weight and wear footwear appropriate to the conditions. Use appropriate safety gear when climbing or working at heights.

3.4.2 Vehicle strikes or mishaps (including drowning)

The wildlife response may involve working in and around a range of air, sea and land vehicles. Be aware of traffic around you, including parked and off-road vehicles. Wear seat belts at all times. Personnel working on boats and aircraft will be briefed on the relevant safety and emergency procedures and must comply with the use of additional personal safety equipment as required.

3.4.3 Manual handling

Be aware of manual handling risks that may arise when handling or moving animals, particularly heavy animals such as adult sea turtles and marine mammals. Use the appropriate number of people and lifting aids as instructed.

3.4.4 Animal bites, scratches, stab wounds

Be aware of the ability of wildlife to inflict injury via bites, scratches and stab injuries from sharp beaks. Handling should be undertaken by experienced personnel (or under the direction of such personnel where appropriate) and appropriate PPE should be worn. All inflicted injuries (even superficial ones) should be appropriately treated as soon as possible to prevent infection and promote healing, and advice should be sought on zoonotic risks (see also G-2 *Biosecurity in OWR*).

3.4.5 Dangerous animals

Large animals are potentially dangerous due to their size, weight and strength. Take particular care when working around marine mammals (both in the ocean and on land) and follow the instructions of the team leader when approaching or handling these animals. Inexperienced or unauthorised personnel should not approach large marine mammals or other dangerous animals such as saltwater crocodiles. See G-3 *OWR strategies by fauna group* for further information.

3.4.6 Needle sticks, lacerations

Veterinary activities during an OWR carry the risk of injury from medical equipment, such as needle sticks and scalpel lacerations. Food preparation activities in a rehabilitation or primary care facility may present hazards from blender and knife use. Use all medical equipment with care. Dispose of all sharps immediately after use in designated medical sharps containers. Handle food preparation knives with care and use all cutting equipment as instructed. All inflicted injuries (even superficial ones) should be appropriately treated as soon as possible to prevent infection and promote healing, and advice should be sought on zoonotic risks (see also G-2 *Biosecurity in OWR*).

3.5 Zoonoses

Diseases that can be spread from animals to humans are called *zoonoses*. Depending on the zoonosis, transmission to humans may occur through inhalation, ingestion, direct contact with the skin and mucous membranes, or through bites and scratches. Most zoonoses likely to be encountered in OWR are spread when organisms on the hands are ingested or spread to a wound or mucous membranes. Hand washing is the single most effective tool in breaking zoonotic transmission cycles. Ensure appropriate hand washing facilities are available before handling wildlife and always practise excellent standards of personal hygiene. Wear appropriate PPE as directed and seek medical attention for all wounds.

Pregnant, ill and immunocompromised people will be more susceptible to zoonotic diseases and it is recommended that they do not work directly with oiled wildlife.

G-2 *Biosecurity in OWR* provides more information about zoonotic diseases likely to be encountered in an OWR and outlines the control measures required to mitigate these risks. G-2 also provides information on sapronotic diseases (where the infectious agent is contracted from contaminated soil and water) and infectious diseases associated with animal food preparation.

3.6 Hazardous chemicals

Hazardous products used during the OWR include oil dispersant chemicals, sample preservation agents such as ethanol and formalin, and disinfectants such as bleach. Personnel should follow all handling advice, safety procedures and PPE requirements outlined in the Material Safety Data Sheets (MSDS) specific to the hazardous chemical(s) being used.

3.7 Electric shock, fires

Water and electricity are always in close association during an OWR. Risks include lighting around pools, water body heaters, filters, and electrical devices in the washing area. Proper handling and grounding methods should be used by personnel working on or around electrical hazards. All electrical equipment should be tagged and installed by qualified electricians. Extension cords and/or surge strips must not be “daisy chained” or strung through walls or windows. Any electrical faults or malfunctions must be immediately reported, and the faulty equipment taken out of use.

3.8 Venomous animal bites and stings

There is some risk of encountering venomous animals during an OWR. Most sea snakes are venomous, but they are generally docile in nature, and venom injection is rare when bites do occur. Terrestrial snakes may become oiled during predation activities on oiled shorelines or may be encountered incidentally during field search and rescue activities. Other venomous marine fauna may be incidentally encountered, including, but not limited to, jellyfish (some of which are highly venomous e.g., Irukandji), sea urchins and stone fish. Wear appropriate footwear where there is a risk of encountering terrestrial venomous snakes. The handling of venomous snakes by unqualified personnel is strictly prohibited. In the event of a venomous snake bite or other animal bite or sting, apply first aid principles and seek immediate medical attention.

3.9 Restricted drugs (Schedule 4 and Schedule 8)

Veterinary S4 and S8 pharmaceuticals are prescribed by veterinarians and should be used and handled strictly in accordance with prescribed instructions. The use and storage of S4 and S8 drugs, (which include all anaesthetics, euthanasia solutions and antibiotics) must be strictly controlled and documented by the responsible veterinary personnel and these products must only be used by authorised, registered personnel.

4. Risk evaluations

This risk assessment was developed using the risk matrix in Table G-1-1. Table G-1-2 summarises the hazards, risk evaluations and control measures for each phase of the OWR. These risk evaluations are cross-referenced in the Procedures documents P-1 to P-8 in this Manual.

G-1

Table G-1- 1: Risk assessment matrix

The risk of a hazard for each phase is calculated as:

L (Likelihood) x C (Consequence) = RR (Risk Rating)

L = Likelihood: 5 = very likely; 4 = likely; 3 = possible; 2 = unlikely; 1 = highly unlikely

C = Consequence: 1 = insignificant; 2 = minor; 3 = moderate; 4 = major; 5 = severe

RR = Risk Rating: Extreme High Medium Low Not applicable

				CONSEQUENCE				
				1	2	3	4	5
				INSIGNIFICANT	MINOR	MODERATE	MAJOR	SEVERE
				Near misses; no first aid required	Requiring first aid only	Requiring professional medical attention	Serious long-term injury or health effects	Fatality or permanent health/physical disability
LIKELIHOD	5	HIGHLY LIKELY	> once per year	5	10	15	20	25
	4	LIKELY	At least once per year	4	8	12	16	20
	3	POSSIBLE	At least once in 3 years	3	6	9	12	15
	2	UNLIKELY	At least once in 5 years	2	4	6	8	10
	1	HIGHLY UNLIKELY	< once in 5 years	1	2	3	4	5

Table G-1- 2: Risk evaluations and controls for Phase 1-8 of OWR

		1. Reconnaissance			2.Preventative Actions			3. Rescue			4. Field Processing			5.Intake			6.Cleaning			7. Rehabilitation			8. Release			CONTROL MEASURES
NO.	**HAZARD**	**L**	**C**	**RR**	**L**	**C**	**RR**	**L**	**C**	**RR**	**L**	**C**	**RR**	**L**	**C**	**RR**	**L**	**C**	**RR**	**L**	**C**	**RR**	**L**	**C**	**RR**	
3.1																										
3.1	Exposure to oil spill pollutants and contaminants	4	3	**12**	4	3	**12**	5	3	**15**	5	3	**15**	4	3	**12**	4	3	**12**	2	3	**6**	1	3	**3**	Wear PPE (gloves, overalls, goggles, masks, face shields, footwear and aprons) as directed. Remove all oil-contaminated gear in designated areas. Wash hands before eating, drinking or smoking. Maintain adequate ventilation in areas where oiled wildlife are located (including transport vehicles).
3.2	Environmental exposure: dehydration, hypothermia, hyperthermia, sunburn, heat exhaustion	5	3	**15**	5	3	**15**	5	3	**15**	4	3	**12**	3	3	**9**	3	3	**9**	3	3	**9**	3	3	**9**	Take appropriate rest breaks, self-monitor for heat stress, especially when wearing PPE. Drink water regularly. If immersed in water or working on boats, be aware of hypothermia risks. Wear appropriate protective clothing to protect from sun, wind and rain (wet weather clothing, hats, sunglasses etc.). Use sunscreen regularly.
3.3	Stress, fatigue and burnout	3	3	**9**	3	3	**9**	4	3	**12**	5	3	**15**	5	3	**15**	5	3	**15**	5	3	**15**	1	3	**3**	Take rest breaks to remain mentally alert. Be alert for signs of fatigue and stress in yourself and others, and address these or seek support promptly.
3.4.1	Physical injury – slips, trips and falls	3	5	**15**	3	5	**15**	3	4	**12**	3	3	**9**	3	3	**9**	4	3	**12**	4	3	**12**	3	2	**6**	Avoid relying on unstable terrain to support body weight. Wear appropriate footwear and use climbing aids as required if working at heights. Use traction mats in high slip risk areas.
3.4.2	Physical injury – vehicle strike or mishap (including drowning)	2	5	**10**	2	5	**10**	2	5	**10**	1	5	**5**	1	3	**3**	1	2	**2**	1	2	**2**	2	4	**8**	Be aware of traffic around you, including parked and off-road vehicles. Wear seat belts when in land vehicles. Duties requiring working in and around boats or aircraft will require use of personal safety equipment and briefing on special safety and emergency procedures.
3.4.3	Physical injury – manual handling			**na**	2	3	**6**	3	3	**9**	3	3	**9**	2	3	**6**	2	2	**4**	3	3	**9**	2	2	**4**	Proper handling techniques to be used. Loads to be broken down whenever possible. Lifting/carrying aids to be used as needed, such as specialised slings and stretchers for lifting heavy animals.
3.4.4	Physical injury – animal bites, scratches, stab wounds			**na**	2	3	**6**	4	3	**12**	4	3	**12**	4	3	**12**	4	3	**12**	4	3	**12**	2	3	**6**	Only experienced personnel, or those under direct supervision of experienced staff, should handle wildlife. PPE to be worn commensurate to the risk (e.g. safety goggles when handling birds with the potential to cause penetrating eye injuries - see G-3). Two people minimum required for cleaning - one handler, one cleaner.

KEY: L = Likelihood; C = Consequence; RR = Risk Rating; na = not applicable

Table G-1-2 (Continued)

		1. Reconnaissance			2. Preventative Actions			3. Rescue			4. Field Processing			5. Intake			6. Cleaning			7. Rehabilitation			8. Release			**CONTROL MEASURES**
NO.	**HAZARD**	**L**	**C**	**RR**	**L**	**C**	**RR**	**L**	**C**	**RR**	**L**	**C**	**RR**	**L**	**C**	**RR**	**L**	**C**	**RR**	**L**	**C**	**RR**	**L**	**C**	**RR**	
3.4.5	Physical injury – dangerous animals	1	5	**5**	1	5	**5**	2	5	**10**	2	4	**8**	2	3	**6**	2	3	**6**	2	3	**6**	2	2	**4**	Only experienced & authorised personnel to approach large/dangerous animals. Designated restraint equipment and PPE to be used as directed.
3.4.6	Physical injury – needle sticks, lacerations			**na**			**na**			**na**	3	3	**9**	4	3	**12**			**na**	4	3	**12**			**na**	Use all medical and food preparation equipment with care and according to instructions. Immediately dispose of all sharps in designated medical sharps containers. Seek medical attention for all lacerations.
3.5	Exposure to zoonoses	1	3	**3**	1	3	**3**	3	3	**9**	3	3	**9**	3	3	**9**	3	3	**9**	3	3	**9**	1	3	**3**	Practise excellent personal hygiene. Wear appropriate PPE as directed. Cover all wounds with waterproof dressings. Seek medical attention for all wounds. Pregnant, ill and immunocompromised persons should discuss the need for additional preventative measures.
3.6	Exposure to hazardous chemicals	3	3	**9**	3	3	**9**	3	3	**9**	3	3	**9**	4	3	**12**	3	3	**9**	3	3	**9**	1	3	**3**	Follow handling advice, safety procedures and PPE requirements outlined in the Material Safety Data Sheet for each hazardous chemical
3.7	Electric shock, fire	1	5	**5**	1	5	**5**	1	3	**3**	1	3	**3**	1	3	**3**	3	3	**9**	3	3	**9**	1	3	**3**	Extension cords must not be "daisy chained" or strung through walls/windows. Electrical equipment must be tagged & installed by qualified electricians. Report electrical faults immediately & remove faulty equipment.
3.8	Venomous animal bites and stings	1	5	**5**	1	5	**5**	1	5	**5**	1	5	**5**	1	5	**5**	1	5	**5**	1	5	**5**	1	5	**5**	Risks include sea snakes, terrestrial snakes, venomous jellyfish, sea urchins and stone fish. Handling of venomous snakes by unqualified personnel is strictly prohibited. Apply first aid principles and seek immediate medical attention if venomous bite or sting suspected. Wear appropriate footwear where there is a risk of encountering terrestrial venomous snakes.
3.9	Exposure to restricted drugs			**na**			**na**	2	2	**4**	3	3	**9**	3	3	**9**	2	2	**4**	2	2	**4**			**na**	Only authorised personnel to handle, prescribe, store and dispense restricted drugs. Follow prescribed instructions at all times.

KEY: L = Likelihood; C = Consequence; RR = Risk Rating; na = not applicable

G-2: BIOSECURITY IN OILED WILDLIFE RESPONSE

1. Purpose and scope

Good biosecurity practice helps to keep wildlife, people and domestic animals safe and healthy by minimising the impacts of infectious disease on individual animals and wildlife populations. Good wildlife biosecurity includes an understanding and a management of disease risk.

The practices of good biosecurity will:

- reduce the risk of introduction of infectious disease and contaminants
- minimise the spread of disease from infected to uninfected areas, and from infected to uninfected individuals
- minimise the risk of zoonotic disease occurrence

These guidelines document the practices and principles for maintaining an acceptable level of biosecurity during all phases of an OWR. The document is based on the 2018 *National Wildlife Biosecurity Guidelines* (NWBG) and should be read in conjunction with the NWBG, available at: https://wildlifehealthaustralia.com.au/Portals/0/Documents/ProgramProjects/National_Wildlife_Biosecurity_Guidelines.PDF
These guidelines are aligned with DBCA SOP *Managing Disease Risk in Wildlife Management.*

2. Basic biosecurity practices (NWBG Section 5.1)

The following basic practices should be observed by all personnel working with wildlife:

2.1 Equipment hygiene (NWBG Section 5.3.4)

All equipment should be maintained hygienically. Organic materials are removed by washing with detergent after use (NWBG Section 5.3.1) and chemical disinfection is undertaken after cleaning. Appendix A-6 of this Manual contains disinfection protocols and product information.

Equipment used for wildlife is dedicated to that purpose and is not utilised for other purposes.

2.2 Hand hygiene (NWBG Section 5.3.2)

Appropriate hand hygiene practice as outlined in section 5.3.2 of the NWBG is undertaken:
- before eating, drinking and smoking
- before preparing and handling animal or human food
- after cleaning equipment, surfaces or the work environment.
- after handling animals and/or their products.

Disposable gloves are available for use if desired for cleaning and food preparation but must be used in addition to good hand hygiene practice, not as a substitute for hand hygiene. Cuts, abrasions and other wounds on the hands must be covered by a waterproof dressing or disposable gloves to restrict entry of pathogens.

No eating, drinking or smoking is undertaken while interacting with wildlife. Visitors coming into wildlife areas are directed to undertake the same hand hygiene processes as Wildlife Unit personnel.

2.3 Personal protective equipment (NWBG Section 5.4)

The PPE requirements for working in an oil-polluted environment are appropriate for biosecurity. These include overalls, boots, gloves, face masks and face shields. The procedure of doffing (removing) PPE when moving from a high to low risk biosecurity zone (see Section 3) is the same as the procedures for removing oiled PPE when moving from a hot zone into a cold zone.

2.4 Movements of animals and personnel; barrier management

It is likely that all wildlife admitted during an OWR will be considered equivalent to one another in terms of biosecurity risk, because they have originated from a common place at a similar time. However, the biosecurity implications of moving animals from one location to another within a facility should be considered at all times. Releasing animals back to the wild brings a risk of transporting pathogens into the wild. These risks should be managed through effective preventative care, pre-release assessment and disease screening (see P-7 and P-8 of this Manual).

Antiseptic footbaths (see Appendix A-6 *Cleaning and disinfection*), dedicated footwear or shoe covers should be positioned at entry points and doorways of buildings where wildlife are held. These areas should be restricted to authorised personnel only and should display appropriate signage to that effect. Separate and dedicated clothing, gum boots, gloves and other personal protective equipment should also be available. Care must be taken to ensure that pool areas are not contaminated with antiseptic solution if footbaths are utilised.

3. Recognising higher biosecurity risk situations (NWBG Section 6.1)

If veterinary staff identify emerging health issues or biosecurity risks in wildlife under rehabilitation, there may be a need for additional risk mitigation processes. Examples include barrier management of pens to contain outbreaks of disease, a requirement to wear additional PPE (e.g. face masks) in the high risk zone, or the use of dedicated tools on animals which demonstrate signs of disease.

4. Zoonotic and sapronotic disease risk management (NWBG Section 7)

Some infectious diseases of wildlife are *zoonotic* (can be transmitted from animals to humans). Depending on the disease, humans can be exposed to zoonoses by inhalation, ingestion, direct contact with the skin or mucous membranes, or through bites and scratches. The most commonly encountered zoonoses are spread when organisms on the hands are ingested or spread to a wound or mucous membranes. *Hand washing is the single most effective tool in breaking zoonosis transmission cycles.* Wear appropriate PPE as directed and seek medical attention for all wounds.

Pregnant, ill and immunocompromised people are potentially more susceptible to zoonotic diseases, and it is recommended that they do not work directly with oiled wildlife.

Infectious organisms which are encountered by contact with water or soil, rather than via a living animal, are called *sapronoses.* The organism which causes tetanus is a common sapronosis, and a tetanus booster is recommended for any penetrating wound or animal bite that is sustained during OWR. The marine environment poses additional risks of infection from other sapronotic bacteria. Though these infections are uncommon, any break to the skin in a marine environment may expose people to these bacteria. Wildlife Unit personnel may become exposed via handling of fish, or from contact with sea water or marine wildlife. Care should be taken with all open wounds in an ocean environment. Clean wounds promptly and cover skin breaks (including cuts and abrasions) with a water-resistant dressing, or wear disposable gloves to protect the wound from exposure to sea water. Obtain medical advice for serious wounds (e.g. a deep puncture wounds, embedded fish spines or major wounds), infected wounds, and wounds in a worker with a health condition that increases their susceptibility to infection.

Any worker who suspects they may have a zoonotic or sapronotic disease should report it immediately to their team leader.

5. Record keeping, animal identification, staff training

See P-4 and P-5i of this Manual for procedures relating to record keeping and animal identification during OWR. Written records are kept of key information relating to daily assessment and behaviour. All staff undergo an induction, which includes biosecurity training, before beginning work within the unit.

6. Animal food preparation and storage areas

Facilities for staff food preparation, storage and meals are separate to those used for wildlife. Wash bays used for the cleaning of wildlife equipment should be separate from the wash bays used for personal hygiene. Procedures should be established by experienced rehabilitation personnel for the appropriate quality assessment, storage, thawing and handling of food used for oiled wildlife.

7. Risk of pests, feral and domestic animals

Indirect or direct contact between wildlife and domestic/feral/pest animals should be minimised as far as possible. Domestic animals should not be permitted in wildlife facilities. Food storage should be protected from contamination by rodent and invertebrate pests, and pest control should be instigated as required.

Wildlife in facilities should be protected from disturbance by birds of prey and feral predators using barrier fencing and visual barriers as required.

8. Biological samples, carcasses and waste

Safe handling, storage and disposal of biological samples and carcasses is outlined in P-5i and P-5ii of this Manual. All personnel should be aware of the correct disposal practices for biological materials and follow the waste management plan for the incident.

Table G-2- 1: Zoonotic and sapronotic diseases which may be encountered during an oiled wildlife response

Zoonotic Disease	**Commonly affected species**	**Likely transmission route to humans in an OWR**	**Risk mitigation measures***	**Comments**
Gastrointestinal bacteria – Salmonella, Campylobacter, E.Coli	Birds, reptiles, mammals	Faecal-oral ingestion; ingestion of contaminated water or food	1 2 3	
Aspergillus fungi	Birds (especially seabirds)	Inhalation of spores	2 4	Ensure good ventilation in all bird holding areas
Atypical tuberculosis (atypical TB bacteria e.g. *Mycobacterium.avium, M. marinum*)	Birds, reptiles	Direct contact; wound contamination. Organisms are common in soil and water.	1 2 3 5	Mainly cause disease in immunocompromised people; may cause skin infections if wounds are contaminated.
Tetanus (*Clostridium tetani*)	Sapronosis	Wound contamination. Widespread in the environment, including manure and saliva	1 3 5	Vaccination recommended for penetrating wound injuries and animal bites
Tuberculosis (Mycobacterium TB complex bacteria e.g. *M. tuberculosis, M.pinnipedii)*	Seals and sealions	Inhalation of infected discharges (live animal respiratory discharge; dead animal infected body fluids; discharges or body fluids aerosolised by hosing)	2 3 4	Good ventilation required; avoid hosing activities that could aerosolise organisms
Ectoparasites – lice, mites, fleas, ticks	Terrestrial mammals; birds	Direct contact with animals; indirect contact with infected bedding	1 2 3	
Avian chlamydia (*Chlamydia psittaci*)	Birds	Inhalation of airborne particles of bird droppings and other discharges; direct contact	1 2 4	Ensure good ventilation in all bird holding areas; avoid hosing activities that could aerosolise organisms.
Giardia and other protozoal endoparasites	Mammals, birds and reptiles	Faecal-oral ingestion; ingestion of contaminated water or food	1 2 3	
Toxoplasmosis (*Toxoplasma gondii*)	Mammals	Handling infected meat products during food preparation	1 2 3	Mostly a risk to pregnant or immunocompromised workers.
Erysipelas (*Erysipelothrix rhusiopathiae*)	Widespread in the marine environment and persists in the cutaneous slime of fish	Contact with contaminated products, especially if breaks in skin are present	1 2	contaminated fish are the most likely source – care with hygiene during handling of fish for food preparation
Sapronotic marine bacteria e.g. *Streptococcus iniae* and *Vibrio vulnificus*	Normal marine bacteria; health risk to humans through contamination of open wounds or abrasions.	Wound contamination	1 2 3	Cover all wounds and seek prompt treatment for skin wounds.

***Risk Mitigation Measures - Key:**

1 Wash hands with hot water and soap after handling animals, animal food, bedding or equipment, and prior to eating, drinking and smoking. No eating, drinking or smoking in animal areas.
2 Use disinfectants and appropriate cleaning techniques as instructed. Maintain clean and hygienic animal facilities.
3 Wear appropriate protective clothing and gloves to reduce exposure to animal waste or body fluids
4 Wear an appropriate respirator face mask (N95 or N99 grade) as directed to reduce the risk of inhalation of infectious material
5 Use of appropriate animal handling techniques, remote capture equipment and protective restraint gloves

G-3: OWR STRATEGIES BY FAUNA GROUP

These tables provide guidance on the broad OWR considerations for selected WA fauna. They are a guide only and information should be sought from experienced sources of local expertise at the time of a marine oil pollution event.

Table G-3- 1 OWR strategies for turtle species

Sea turtles do not appear to display avoidance behaviour on encountering oil. Oiling risks via ingestion, inhalation and contact. Even light hydrocarbons cause burns even though oiling may not be apparent. Prioritise protection of adults, but rescue/pre-emptive capture of immatures is not precluded. Do not pick up live turtles by the flippers; grab both sides of the carapace. Avoid putting hands near the mouth.

Species	Life cycle	Risk period	OWR Considerations
Green Turtle	Foraging	Year round	Feed on seagrass and algae habitats. *Rescue & Rehabilitation*: Adults are large and powerful; in-water capture generally only viable if compromised or in expanses of shallow water, using walley nets or large hoop nets. Capture of adult females on shore can be done by hand and using turtle stretchers for transport. Juveniles 40cm+ appear in coastal waters and could possibly be captured with long handled nets. Any captures need to be removed from the area for the duration of oiling, noting that they may return even if relocated 50km away.
	Mating	Aug-Dec	Distinct aggregation areas preferred in mating season and are priority areas for oiling protection.
	Nesting	Peak Nov-Feb	Nest on deep sandy beaches usually on exposed coasts. Adult females primarily at risk while milling in shallows, and during beach egress from oil that has landed on beaches. Where a nesting beach is threatened, consider pre-emptive capture for the duration of oiling - see Manual P-2 and P-3. A proportion of animals should be tracked to gather data on strategy efficiency if pre-emptive capture occurs. *Rescue & Rehabilitation*: Females can be captured on shore using standard tagging techniques. Oiled turtles should be captured immediately to prevent contamination of beach and sand layers. Nesting females should not be disturbed unnecessarily (see intervention decision flow chart in Manual P-3).
	Nests	Peak Nov-Jan	Nests usually located above the high tide mark but extreme weather events can cause oiling of nest areas. Fresh oil pollution can suffocate eggs/hatchlings, impede emergence and impact survivorship; however, oil that has naturally weathered for a few weeks prior to impact to shorelines may have little effect on nest or eggs. Preventative actions to protect nests from OWR activity outlined in Manual P-3. *Rescue & Rehabilitation*: Nesting females and egg nests should not be disturbed unnecessarily (see intervention decision flow chart in Manual P-3). Remove surface oiling manually from nests where it occurs.
	Hatchlings	Peak Jan-Mar	Hatchlings are at high risk of oiling as they spend more time near the surface, being stuck in heavier or weathered oils. Tend to be found in tidal current convergence zones. Hatchlings are suspected to quickly move offshore. Funnel fencing and pit traps techniques could be used for pre-emptive capture of emerging hatchlings providing nesting females did not compromise trapping or were placed at risk of entanglement. If females are still nesting, could attempt hand capture of hatchlings: station personnel every 100-200m, patrolling through the evening and early morning. It is essential that hatchlings are transported to a suitable site and released within 12h.
Flatback Turtle	Foraging, Mating	Year round	Distinct aggregation areas should be identified and prioritised for search and preventative action efforts. *Rescue & Rehabilitation*: Adults are a moderately sized but relatively aggressive. In water capture possible with hoop nets, may be possible to capture some females resting on beaches. Management of nests and hatchlings as per Green Turtles.
	Nesting	Pilbara & W.Kimberley Oct-Feb; E.Kimberley Jun-Oct	Nest on medium to shallow sandy protected beaches during mid to high tides. Otherwise as per nesting Green Turtles.
	Hatchlings		Hatchlings are large and vigorous and are suspected to quickly move offshore to inter-island or coastal habitats.
Hawksbill Turtle	All		Found around reefs coastal areas and lagoons. Very high protection priority as is endangered in an international context. Hatchlings are quite small compared to Green and Flatback Turtles. *Rescue & Rehabilitation*: as for Green Turtles
Loggerhead	All		Found on shallow continental shelf and coastal bays. A high protection priority. *Rescue & Rehabilitation*: as for Green Turtles
Leatherback Turtle	Foraging		Pelagic ocean species. *Rescue & Rehabilitation*: massive size of adults makes capture in water extremely difficult. Captive care not recommended due to need for unobstructed swimming and specialised jellyfish diet. Do not bring into care unless specialised expertise and facilities available.

Table G-3-2 OWR strategies for aquatic birds

Species	Life cycle	Risk period	OWR Considerations
ALL SPECIES: Dusk and dawn are often the optimal search time for seabirds that hunt at sea visually. For shorebirds, searches at high tide are optimal as birds are concentrated in roost locations. Many long-necked waterbirds, but especially gannets, cormorants, darters and herons, will strike at the eyes. Eye protection, long sleeves and sturdy gloves should be worn when handling. Never tape or hold a bird's bill closed, especially in species with small nostrils which must breathe through their mouth (e.g. pelicans, cormorants, albatross, petrels).			
Migratory and resident shorebirds	Foraging, roosting	Migratory spp: Sept-Mar. Resident spp: year round.	Migratory shorebirds do not nest in Australia, but some juveniles may remain year-round. Forage on intertidal flats during mid to low tides, roosting at high tide. Feeding response to MOP unknown. Birds oiled during feeding on intertidal flats may become trapped when tide rises so aquatic patrols of feeding areas & shorelines for capture should be considered. Hazing could be attempted for small areas of shoreline pollution. Pre-emptive capture largely impractical as individuals disperse to feed. *Rescue & Rehabilitation:* capture using hand nets & transport in calico bags (short term) or pet packs. Noose mats & cannon nets may be used to capture unoiled birds but is likely to be difficult & rapid capture of all birds is unlikely.
Resident shorebirds	Nesting	Peak nesting Aug-Feb	Nest on coastal beaches, wetland fringes & islands, above the high water mark. Nestlings & eggs can be oiled by contact from adults. Hatchlings can forage by themselves after hatching but stay in family groups for some time. Surveys needed to determine nest locations near impacted shorelines. Nest building birds can be hazed from oil impact zones. *Rescue & Rehabilitation*: Capture using hand nets. Prioritise adult birds.
Seabirds - Sea foragers that utilise islands and coasts: terns, gulls, boobies, gannets, noddies, shearwaters	Foraging, roosting Nesting	Year-round Sept-Mar	Will dive through surface oil if prey visible. Numbers highly variable seasonally & annually; pre-oiling surveys critical to ascertain status. Can forage long distances from nesting & roosting sites. Birds oiled during feeding may be unable to fly back to shore so aquatic patrols of feeding areas & shorelines should be considered. Show a preference for roosting on sandy points, spits & low rocky bars near the ocean. Birds lightly oiled or coated with light oils may be able to fly back to roosts, up to 50km from oiling. Searches & monitoring should include roosting sites. Nest on islands or the mainland either on the surface, in crevices, in vegetation or in burrows. Nestlings & eggs at risk of oiling from contact with adults. Pre-emptive capture of chicks should be considered for high conservation value species. *Rescue & Rehabilitation*: Large species require a run up & winds > 20km/h to take off, so capture on land & water is relatively easy using long-handled nets or towels. When attempting land capture, ensure someone is standing between the bird & the water to prevent entry. Gannets have very sharp & serrated bill edges & a strong neck that can cause severe injuries to humans. These species may regurgitate stomach oil as a defence mechanism. Highly susceptible to foot pressure injuries - use rubber tube matting or suspended netting for all flooring, including transport containers & holding pens.
Seabirds - Cormorants and darters all species	All	Year-round	Predisposed to oiling as will readily swim through heavy oils. May travel large distances from roosting sites but feed close to shore. Cormorants saturate their feathers to hunt & will look wet after foraging when drying wings for flight (may be confused with light oiling). Cormorants prefer to roost on elevated coastal headlands or trees to assist take off. Nest on elevated coastal headlands or in vegetation in freshwater swamps. *Rescue & Rehab*: Can be captured on land or in water. Strong birds will dive to escape capture. Nestlings should be monitored & only captured if abandoned or parent birds are oiled. Note: feathers are partially "wettable" so assessment of waterproofing needs a different approach - see P-7 of Manual.
Herons, egrets, pelicans	All	Year-round	Found in freshwater brackish & coastal habitats. Herons & egrets common in suitable coastal & offshore island & mangrove habitats. Forage amongst mangroves & intertidal flats or in shallow pools near roosting sites & nest sparsely in coastal vegetation. Pelicans nest in colonies on inland lakes & coastal islands. Prefer shallow protected waters for feeding & can travel very large distances from roost or breeding sites to forage areas. *Rescue & Rehabilitation:* Oiled birds may still be able to fly. Long-handled nets & towels useful for capture. Bills & legs are fragile, beware fracture risk.
Penguins	All	Year-round	Colonies on islands between Carnac Is. & Twilight Cove on south WA coast. Moult all feathers at the same time over 2 wks in Nov-Feb (may moult any time in this period & don't all moult at the same time). During moulting birds do not go swimming to forage, although they may enter the water to cool down & to drink. Breeding: Apr-Dec. Egg laying Apr-Nov. *Rescue & Rehabilitation:* A robust species, copes well in rehabilitation. Restrain head & wear sturdy gloves as bills are very sharp. Highly susceptible to foot pressure injuries - use rubber matting or suspended netting for all flooring, including transport containers.
Marine birds of prey	All	Year-round	Elevated roosting perches with view of ocean preferred. Nests commonly located on tall structures (trees, mangrove, man-made) or rocky headlands. Monitoring should focus on known nest sites/perches. *Rescue & Rehabilitation*: For safety, only experienced personnel should capture or handle raptors.

Table G-3- 3 OWR strategies for marine mammals

See P-3 of this Manual for intervention decision flow charts for marine mammals.

SIRENIANS & CETACEANS Aerial surveillance followed by herding and hazing by vessels or aircraft may be viable, particularly if dugongs are at threat of oiling. The use of towed arrays of seismic survey equipment using soft start procedures may be effective if cetaceans are observed in spill areas. Stranded cetaceans should be supported upright, holes dug for the pectoral fins, and the skin kept moist using wet towels or blankets and misting. Stranded cetaceans and sirenians should not be pushed out to sea without a proper evaluation by experienced assessors. Rehabilitation is unlikely to be a viable option as there are no established facilities in WA.			
Species	**Life cycle**	**Risk period**	**OWR Considerations**
Dugong	Foraging swimming	Year around from Shark Bay MP northward	Population data limited. Pre-emptive capture and transport is not considered viable. Hazing/herding away from oil slicks is a possible strategy but may only be viable in spills of small to moderate size. Aerial spotting, and herding using vessels, could be attempted.
Humpback whales	Migrating	May - Aug: north to calving grounds (Ningaloo MP to the Kimberley); Sept - Nov: south to Antarctic feeding grounds	Northern and southern migration follows a predictable progression of age and sex classes. Northern migration generally 150-350m depth contours averaging 50km offshore. Sub adults with lactating females lead migration, mature males and females following, with near term pregnant females at the rear. Southward migration closer to shore (35km offshore) due to accompanying calves. *Rescue & Rehabilitation:* see Large Cetaceans below
Humpback whales	Calving & resting	Pods with calves late July to Sept in the SW Pilbara	Calving has been observed from NW cape northward but primarily occurs in Kimberley waters between Broome and the Camden sound (CWR 2011). Important resting areas during migration: Lacepede Islands, Pender Bay, Eighty Mile Beach MP, Nickol Bay, Exmouth Gulf, Shark Bay MP, Ngari Capes MP.
Other large cetaceans			*Rescue & Rehabilitation*: there are no viable rescue strategies for oiled large cetaceans. Any indications of oiling should be documented and any dead or ill animals should be sampled for hydrocarbons (see Manual P-5i and P-5ii).
Dolphins	all	Year round	Found widely from inshore coastal to offshore areas throughout WA. Bottlenose and Indo Pacific Humpback dolphins are commonly seen inshore. Snubfin dolphins inhabit rivers and estuaries north of Exmouth Gulf.
PINNIPEDS Capture and handling requires experienced personnel and specialised equipment. Capture generally should only be considered for individuals on beaches, spits, tide flats or other relatively flat surfaces, using herding boards and nets (long-handled dip nets, floating bag nets, or net guns). Aquatic captures may utilise tangle nets, float nets, or Wilson traps. Chemical restraint requires highly trained personnel; typically, if a large pinniped is healthy enough to require anaesthesia for capture, the subsequent care will be too great a risk to personnel after recovery.			
Species	**Life cycle**	**Risk period**	**OWR Considerations**
Fur seals: Long-nosed fur seal; Subantarctic fur seal			Long-nosed fur seals breed late Nov to mid-Jan, with most pups born in Dec. Breeding colonies on islands along south coast and north to Bunker Bay; non-breeding haul-out populations found further north to Rottnest Island & islands in Jurien Bay. Subantarctic fur seals do not colonise WA but young animals are sometimes carried further north to WA's coastline by strong ocean currents.
Sea Lions: Australian sea lion		year round	Breeds and rests on sandy beaches on offshore islands from Houtman Abrolhos Islands, southward and eastward as far as Kangaroo Island in South Australia. Perth populations are all males and breed on islands near Jurien (where the females and juveniles stay all year).
Seals: Leopard seal, crabeater seal, elephant seal			Vagrant individuals only - no seal species colonise WA coastline or offshore islands. *Rescue & Rehabilitation:* the biosecurity risk of releasing rehabilitated seals which may take novel pathogens to Antarctic waters must be carefully considered.

Table G-3- 4 OWR strategies for other marine and terrestrial fauna

OTHER MARINE FAUNA			
Species	**Life cycle**	**Risk period**	**OWR Considerations**
Whale Sharks	Migrating & feeding	Mar-Jul	Occur seasonally along the Ningaloo Reef and aggregations of large numbers are found at Black Rock near Pt Cloates in May and the Yardie Creek to Tantabiddi area in June. Oil avoidance behaviour unknown. At risk of ingesting or becoming coated in floating oil, oil emulsions and dispersant while surface feeding. Animals found in an oil spill area should be monitored and tagged if possible. There are no viable rescue/rehabilitation strategies for this species.
Manta Rays	Migrating & Feeding	Year round	Feed at all levels of the water. Believed to avoid water laden with small coelenterates and may similarly avoid oiled areas. At risk of ingesting or becoming coated in floating oil, oil emulsions and dispersant when on the surface. Animals found in an oil spill area should be monitored and tagged if possible; capture and cleaning unlikely to be viable options.
Sea snakes		Year round	Sea snakes come to the surface to breathe and bask and will be susceptible to oiling. *Rescue & Rehabilitation*: Most species are venomous, but they are generally docile in nature, and venom injection is rare when bites do occur. The handling of venomous snakes by unqualified personnel is strictly prohibited. Capture and cleaning of oiled animals is possible - see Manual P-6.
Estuarine crocodile		Year round	*Rescue & Rehabilitation*: Extremely dangerous. Capture and cleaning will only be undertaken by experienced handlers if human safety risks can be satisfactorily mitigated. Refer to local DBCA crocodile response plans for intervention or translocation of crocodiles at risk or affected by oil pollution.
TERRESTRIAL SPECIES: Most terrestrial species will be amenable to rescue and rehabilitation using established trapping and rehabilitation techniques for the species.			
Species	**Life cycle**	**Risk period**	**OWR Considerations**
Quolls		Year round	May visit shorelines to predate on turtle hatchlings during turtle nesting season. Monitor beaches for tracks indicating presence.
Macropods (Kangaroos, Euros, Hare-wallabies, bettongs)		Year round	Kangaroos, wallabies and bettongs occasionally visit shorelines to forage; bettongs may predate on turtle eggs or hatchlings. Euros are often sighted on beaches within their range. *Rescue & Rehabilitation:* Small macropods can be captured using normal trapping techniques on oiled beaches and adjacent habitats. Hand capture and nets may also be used by experienced persons in some circumstances. Large species will need to be darted with anaesthetic drugs. Risk of exertion myopathy with persistent chasing and activity; consider these risks before attempting capture.
Brush-tailed Possum		Year round	Regular movement along beaches of some offshore islands, particularly in summer.
Bandicoots		Year round	Bandicoots predate on turtle eggs, hatchlings and ghost crabs in intertidal areas of beaches
Water Rat		Year round	May be widespread along coastal beaches, mangroves, and headlands within its range.
Other native rats, mice and dasyurids		Year round	Rare visitors to beaches; low risk of oiling
Perentie		Nov-Mar	Common beach visitors; predators of turtle eggs and hatchlings. *Rescue & Rehabilitation:* hand capture possible using pole nooses or refuge traps.
Land snakes		Year round	Land snakes are known to predate turtle hatchlings and eggs on turtle nesting beaches. *Rescue & Rehabilitation:* Capture and cleaning of oiled animals is possible - see Manual P-6. The handling of venomous snakes by unqualified personnel is strictly prohibited.
Ghost crabs		Year round	Capture and cleaning are feasible. Use techniques in Manual P-6 for turtle shells.
Emus		Year round	Occasionally swim in lagoon waters. Deterrence activities should be considered. Difficult to catch and stressed by restraint. Capture for cleaning unlikely to be feasible.

G-4: OWR EUTHANASIA PLAN

1. Purpose and scope

An important part of the oiled wildlife response is to promote the welfare and to minimise the suffering of fauna displaced or polluted by the oil. This reflects both the role of DBCA as the lead agency for OWR in WA State Waters, and the public expectation that environmental damage caused by oil spills be repaired as completely as possible.

Euthanasia is the act of inducing death in a humane manner and is an important part of the triage process for oiled wildlife. It is used to end the suffering of animals that cannot be saved due to their condition/injuries, or that should not be saved due to issues concerning their quality of life in captivity or their capacity to survive in the wild. Euthanasia should also be considered when too many animals are recovered and there are insufficient facilities and personnel to deal efficiently with the incident, thus putting animals that are more likely to survive at risk.

Although euthanasia is an important animal welfare tool for minimising the suffering of oil-affected animals, it should not be undertaken lightly. Whether the rehabilitation process is in the best interest of the oil-affected animal is a decision which must be made by qualified experts, based on reliable scientific evidence.

These guidelines are based on IPIECA (2017) *Key Principles for the Protection, Care and Rehabilitation of Oiled Wildlife* and outline the decision-making process for euthanasia of oil-affected wildlife under the WAOWRP. The guidelines apply to all OWR activities undertaken by, or on behalf of, DBCA and are consistent with the DBCA *Code of Practice for Wildlife Rehabilitation in Western Australia* and DBCA SOP *Euthanasia of animals under field conditions.*

2. Criteria for euthanasia of wildlife

Triage is the process of prioritising and sorting animals for treatment based on their health, welfare, conservation value and resource availability. Triage is performed regularly and repeatedly throughout the OWR, as demands on resources will change and the intensiveness of care which can be provided for each individual changes accordingly.
During an OWR, triaged animals will be designated to one of the following priorities:

Priority 1: good chance of successful rehabilitation – treat and rehabilitate first;
Priority 2: reasonable chance of successful rehabilitation – treat after Priority 1 cases;
Priority 3: poor chance of successful rehabilitation – to be euthanased.

Figure G-4-1 summarises the triage process during OWR. These criteria are based on the promotion of the highest standards of animal welfare, human safety and conservation of biodiversity.

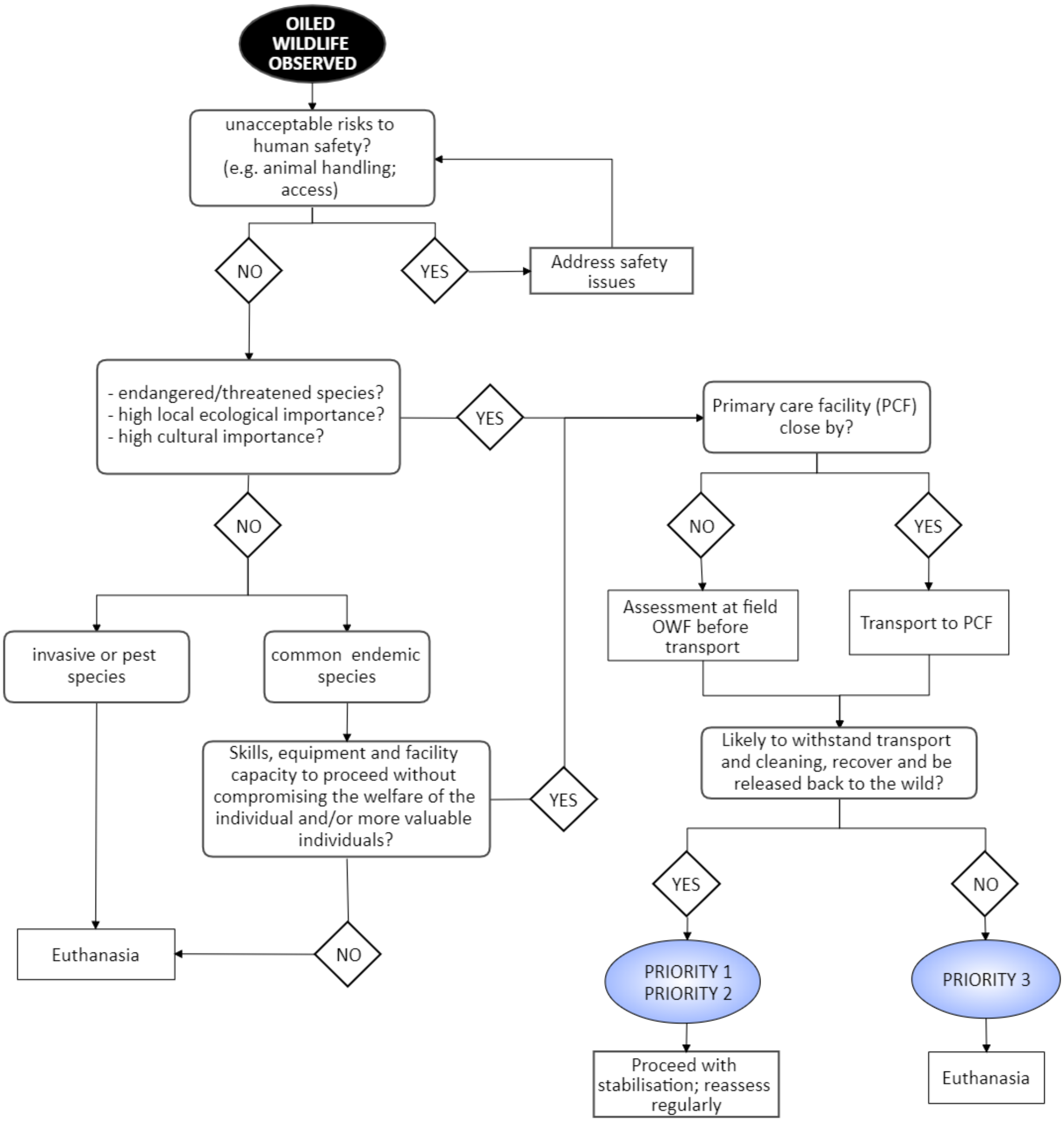


Figure G-4- 1: Triage process for oiled wildlife field processing

2.1 Species and/or conservation status

Advice on the conservation status and ecological importance of species likely to be impacted by a spill will be made available through the Planning section of the IMT. Priority of treatment and resourcing should be given to endangered and threatened species, or those with high local or cultural significance. This does not preclude the rehabilitation of common species if it is possible to provide effective rehabilitation to them without compromising the care of priority species.

The *Code of Practice for Wildlife Rehabilitation in Western Australia* strongly recommends that invasive and pest species be euthanased rather than rehabilitated. This principle should also apply during an OWR.

2.2 Health status

If evaluation of the health status of the animal by a suitably qualified person (preferably a veterinarian) indicates that the animal is **unlikely to be able to recover and to be released successfully to the wild**, it should be euthanased. Specific health conditions which may support a decision to euthanase are detailed in P-5i of this Manual and include severe injury, disease other than oiling, and permanent functional impairment.

2.3 Type of oil exposure

The amount of oil present on an animal is not a significant criterion in terms of the potential for successful return to the wild. However, the length of time for which the casualty has been oiled and exposed to absorption of toxins does affect outcome. The type of oil involved may also have an impact on prognosis (e.g. lighter grade oils are less persistent but more toxic).

2.4 Location of animal rescue in relation to OWR facilities

Much of the coastline of WA is remote and difficult to access. In the event of shoreline oil contamination in these areas, OWR may be constrained by accessibility challenges. Remote field stations may be the only possible primary care facility, which could restrict the options for treatment and rehabilitation. Alternatively, animals may need to be transported several hours to a primary care facility, a process which is highly stressful for wildlife. These factors combine to mean that animals which come to shore in remote areas are less likely to survive than those which are collected closer to established infrastructure. If the animal's welfare needs cannot be met within a reasonable time to prevent unnecessary suffering, euthanasia should be considered.

2.5 Availability of resources and facilities

During a large spill, availability of skilled personnel may be limited. If an individual casualty requires an excessive additional amount of skilled time, this may compromise the welfare and survival of other, less-severely affected individuals which could otherwise have received the less complicated care they required. Limitations on facilities may put animals at risk of overcrowding which reduce the chances of survival. Even if it is decided that it will be possible to treat all individuals, it will be necessary to triage and decide which individuals are to be treated first. Where such constraints exist, it may be necessary to lower the euthanasia threshold in the interests of achieving the best balance of individual welfare.

3. Euthanasia techniques

The goal of euthanasia is to produce a painless, rapid death while avoiding undue stress in the animal. The technique used should be as reliable, simple, safe and effective as possible, should only be performed by competent personnel, and should not compromise human safety or cause unacceptable levels stress to human observers or operators.

The most widely used and effective method of euthanasia in in OWR is the intravenous injection of barbiturates. This technique must be undertaken by authorised or appropriately qualified personnel under the supervision of a veterinarian.

Other methods which may be considered for euthanasia in field situations include:

- shooting via firearm
- captive bolt device
- blunt force trauma

- cervical dislocation
- implosion (large cetaceans under certain specific circumstances, by authorised and trained DBCA personnel – see Coughran et al 2012)

The euthanasia method/s used in individual oil pollution events must be approved by the Wildlife Coordinator, in consultation with veterinarians and other advisors. Methodology must be in accordance with the following DBCA documents:

DBCA SOP *Euthanasia of animals under field conditions*
DBCA SOP *Use of captive bolt devices (CBDs) for euthanasia of fauna*
DBCA SOP *Euthanasia of small stranded cetaceans using firearms*
DBCA Corporate Policy Statement 20 *Departmental use of firearms*
DBCA Corporate Guideline No. 42 *Departmental Use of Firearms 2020* and associated SOPs

4. Confirmation of death

After euthanasia, it is essential to establish that the animal is dead. Methods should be appropriate to the species being euthanased, and all animals should be monitored over at least 5 minutes to ensure death has occurred. If there is any doubt about confirmation of death, a secondary euthanasia method must be used to ensure the animal is dead.

Death should be confirmed by experienced personnel, preferably with veterinary training.

<u>At least</u> three of the criteria below should be used to establish that death has occurred:

- absence of a visible, palpable and/or audible (if stethoscope used) heartbeat on two separate checks by a competent examiner at least five minutes apart;
- lack of palpable pulse (femoral or jugular) on two separate checks by an experienced examiner at least five minutes apart;
- absence of respiratory movement when monitored continuously for a minimum of one minute;
- no blink response or eye-protection reflex (corneal reflex) elicited when the corner of the eye is touched gently;
- mammals only: pupils fixed and dilated and do not constrict when a light is shone on them;
- loss of response to noxious stimulus (e.g., no limb withdrawal in response to a firm toe pinch);
- change of mucous membrane colour (white or grey/blue rather than rosy pink) in non-pigmented areas;
- absence of capillary refill in gums: press firmly with a finger on the gum until it goes white, then watch to make sure it does not return to its previous colour. This demonstrates absence of capillary blood flow (a normal healthy animal has a capillary refill of 1-3 seconds)
- rigor mortis (onset after several hours).

5. Post mortem management

All dead bodies from oiled wildlife events should be processed, examined and disposed in accordance with P-5ii of this Manual.

G-5: FLUID THERAPY and NUTRITIONAL SUPPORT

1. Purpose and scope

Animals which have been oiled are highly likely to be dehydrated and underweight due to the toxic effects of oil which lead to debilitation and inappetence. Providing fluids restores hydration and assists in treating shock; oral fluids flush toxic ingested oil from the digestive tract. Providing nutrition via formulated diets supports metabolism and weight gain until animals can transition to self-feeding on unprocessed food items.

This document provides guidance on fluid and nutritional supplementation products and processes. The focus is mostly on birds, as the body of knowledge on effective fluid and nutritional therapy for oiled birds is far more extensive than other taxa, which are generally affected and treated in smaller numbers during an OWR. Where no specific guidelines are provided for other taxa, the advice of rehabilitators and veterinary personnel with experience in caring for that taxon should be followed.

2. Equipment

Lists of equipment required for fluid therapy and nutritional formula administration are in Appendix A of the WAOWRP.

3. Fluid therapy

3.1 Route of administration

3.1.1 Oral fluid administration and gavage

The oral route is the preferred route of fluid administration for oiled animals, because it enables the treatment of large numbers of animals under field conditions. In birds, fluid therapy is generally administered via *gavage* (passing a tube down the oesophagus towards the stomach via the mouth), until animals are eating and drinking for themselves. Gavage is a highly stressful and specialised process for large turtles and should be considered a last resort option. Gavage is unlikely to be practical in mammals except for juvenile pinnipeds, and there is a high risk of eliciting vomiting or regurgitation in pinnipeds, so any decision to undertake gavage must be taken only after careful consideration of the risks by experts.

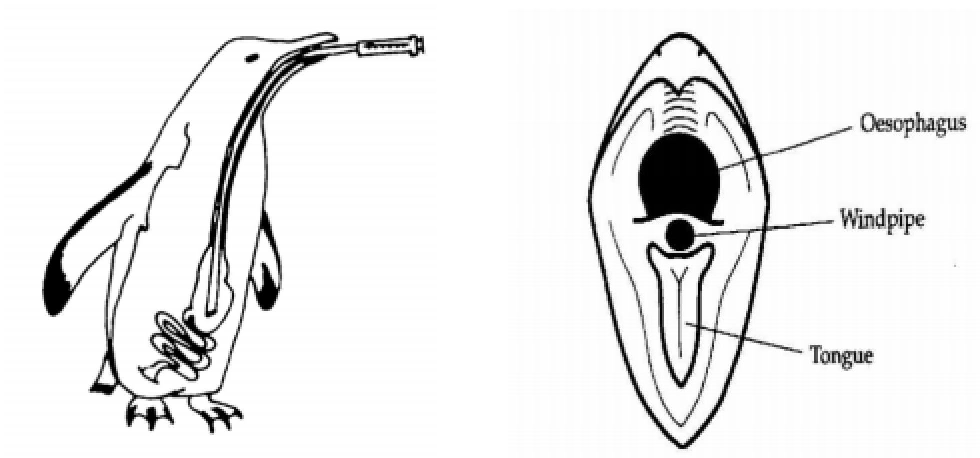
WARNING: Gavage is a specialist activity and should not be attempted by inexperienced or untrained personnel. The information below is provided only for orientation.

At least two people are required to gavage a bird or a small reptile safely: one to hold the animal in the appropriate position, and one to pass the tube or crop needle and administer the fluid or formula. Larger individuals, and most mammals, are likely to require more people.

Before gavage, ensure the patient is warm, alert and able to sit up. This will help reduce the chance of regurgitation. The tube (or crop needle) is passed over the glottis (opening to the windpipe) to the back of the throat and then down the oesophagus (Figure G-5-1). In sea turtles, most mammals and some birds, it will be necessary to use a mouth gag or chock to avoid the animal clamping down on or biting the tube or needle.

Tubes and crop needles should be lubricated with gel lubricant or water. Fluids should always be administered gradually.

In birds such as pelicans, where the volume to be delivered is large, an alternative to use of a gavage tube or needle is to place fluids in a plastic 120ml bottle and empty it by hand deep into the oesophagus. Like all gavage, this is a specialist activity that should be done by experienced rehabilitators only.



A B

Figure G-5-1 Gavage tube insertion. A. positioning of gavage tube in the stomach of a penguin and B. position of the oesophagus opening relative to the windpipe and the tongue (after Hall 2008)

3.1.2 Parenteral fluid administration

Administration routes other than the oral route are known as *parenteral* routes, and include subcutaneous (SC), intramuscular (IM) and intravenous (IV) routes. These are unlikely to have a major role in a large OWR, especially if most of the patients are birds. However, if appropriate expertise and equipment are available, other fluid administration routes may be considered with the advice of veterinary personnel. The SC route is not recommended unless there is no other option (e.g. pinnipeds or sea turtles which are too large or dangerous for conscious oral fluid administration and cannot be rehydrated through voluntary feeding or other administration routes).

3.1.3 Immersion rehydration (reptiles)

Bathing sea turtles in fresh water is the simplest form of rehydration, so providing access to water at the appropriate temperature (generally 25-30°C depending on size and health status) should be prioritised. The water should be unsalted for the first 24 hours to promote rehydration, then salinity should be gradually increased by 25% per day over several days thereafter as instructed by experienced personnel.

3.2 Fluid therapy products

3.2.1 Oral fluid products

Veterinary oral electrolyte products are generally used for oral rehydration. Appropriate products which are readily available in Australia include Spark Electrovet® (Vetafarm), Lectade® (Jurox) and Vytrate® (Jurox). As a first aid process, warmed tap water or Hartmann's solution are also commonly used for oral administration during OWR.

All oral fluids should be warmed prior to administration (40°C for birds; 38°C for mammals; reptiles should be warmed to 28-30°C before administration of fluids warmed to a similar temperature).

3.2.2 Parenteral fluid products

The most common SC/IV fluid product used in OWR is Hartmann's solution (also known as Lactated Ringer's solution). Other fluid choices may include products containing glucose, which will provide energy to lethargic individuals. A veterinarian should advise on SC and IV fluid selection.

If parenteral routes are used for bolus injections, a veterinarian should advise on the route, quantity and frequency of administration.

3.3 Amount and frequency of oral fluid therapy

3.3.1 Birds

Fluids should not be administered orally unless the bird is alert, responsive, has a normal body temperature, and is not due for transport for at least 30 minutes.

The first fluid administration for a bird is 25ml/kg body weight, then subsequently 25-50ml/kg every 3 hours during the day, aiming for 4 doses in the first 12-18 hours. Nutritional formula should not be introduced until the animal is well hydrated, usually at least 24 hours. The charts in Appendix A-1 *Weight chart for Australian birds* can be used to estimate body weight if the bird is not weighed.

Oiled birds which are not self-feeding are gavaged 4-5 times a day following their initial hydration. A ballpark figure for total daily formula volume is 10% of the bird's body weight. Regular medications and supplements are delivered orally with the gavage feeds, although salt and vitamin supplementation may be delayed until after cleaning.

3.3.2 Mammals

Assume at least 5% dehydration and calculate total fluid requirement as the hydration deficit (deficit in ml = % dehydration x body weight in kg), plus 40ml/kg body weight/day daily maintenance. This amount should be administered within the first 24 hours if possible.

Approximate dose rate for oral fluids is 10-20ml/kg per feed (2-4 feeds per day).

3.3.3 Reptiles

The gavage of sea turtles should be reserved for animals that will not or are physically unable to rehydrate in a pool and drink on their own. Gavage should not be attempted more than once per day and should only be undertaken by experienced and/or trained personnel. For detailed procedures on gavage technique for turtles, see Bluvias and Eckert (2010).

4. Nutritional support

Formulated nutritional support diets can be administered via gavage or offered in dishes for self-feeding. Avoid rushing into assist-feeding oiled animals (either by gavage or by hand feeding) as this can discourage self-feeding as well as creating stress and other health problems. Always address rehydration and feeding response before commencing formula feeding.

4.1 Formula feeding by gavage – general guidelines

The precautions for the use of gavage for fluid administration (Section 3.1) also apply to formula feeding by gavage. The frequency and volume of gavage feeding should be determined by experienced rehabilitators or veterinary personnel and will depend on the animal's size, physiology and tolerance. Handling for gavage feeding can be combined with examination and medication to reduce handling frequency; if this occurs, the feeding should be done last to reduce the chances of regurgitation.

All species should be encouraged to feed themselves as soon as possible. Food should always be provided to encourage self-feeding, particularly overnight. The frequency of gavage feeding should gradually be reduced as self-feeding begins and animals gain weight.

Like fluids, formula should be carefully prepared and monitored so that it is administered at body temperature (but beware overheating).

4.1.1 Birds

The following products have been successfully used and are widely available in Australia:

Hills® A/D diet: a domestic pet high protein supplement which can be diluted with water to make it more easily administered by gavage. This product is a common choice as a gavage product for piscivorous and carnivorous birds. It is diluted for gavage using an oral electrolyte solution (see Section 3.2.1) or water.

Vetafarm® Neocare: a hand rearing formulation which can be used as a supportive gavage feed for herbivorous and granivorous birds.

Vetafarm® Crittacare Avian: a powdered food for dilution in water which can be used for parrots and passerine birds not feeding voluntarily.

A *home-made slurry* for piscivores can be made by blending fish very finely with a small amount of 0.9% saline until smooth, and straining to produce a custard consistency. Fish slurry should not be introduced until the bird has been shown to tolerate electrolytes and finer formula.

A seabird can generally accommodate a maximum of 50ml/kg BWt in a single gavage feed. Start at half this volume and increase slowly.

4.1.2 Pinnipeds

The rehabilitation and nutrition of pinnipeds should be undertaken under the close supervision of rehabilitators with pinniped experience. Pinnipeds that are inadequately hydrated prior to receiving formula or in which inadequate fluid maintenance has been provided are at risk of developing stomach impactions. It is extremely important to maintain adequate hydration, introduce complex dietary formulas slowly (only after adequate hydration has been provided), and increase the volume of formulas in small increments.

For detailed procedures on the feeding of oiled pinnipeds, see Ziccardi et al (2015), Ziccardi (2006), Oiled Wildlife Care Network (2003) and Gage (2002).

4.1.3 Sea Turtles

The appropriate formula for sea turtles will depend on their natural diet. Note that unlike mammals and birds, reptiles can go days, weeks and (in the case of large sea turtles) even months without eating, and it may deter their natural feeding processes if they are stressed by gavage feeding. Decisions on if and when to begin supplementation of nutrition for sea turtles should be made by experienced rehabilitator and/or veterinary personnel.

4.2 Other feeding techniques

Most fish-eating bird species are reluctant to accept artificial diets and should be fed a variety of whole fish species once self-feeding. Species which may be fed include whitebait, whiting, mulies, pilchards and herring. Many seabirds and pinnipeds will require assist-feeding at first as they will not eat dead fish initially. Assist-feeding of whole fish is potentially stressful; the techniques require skill and practice and should be undertaken only by experienced, trained personnel.

Turtles can be coaxed to feed by holding food in front of their mouth using tongs. Once the turtle takes the food, immediately remove the tongs. If the turtle does not eat after attempting for several minutes, try again later. Varying the time of day and the food item(s) offered may also help encourage feeding.

4.3 Rehabilitation diets for self-feeding animals

Food should always be offered, even to animals receiving gavage feeds, and especially overnight.

It is beyond the scope of the Manual to provide detailed advice on the feeding of animals in rehabilitation. Participation of experienced rehabilitators and veterinary personnel is essential to provide the best diets and feeding protocols for animals in rehabilitation. Consult A-5 *Dietary recommendations for selected species* for broad guidelines and seek advice from rehabilitators experienced with the species.

When possible, it should be recorded if animals are self-feeding, either at the individual level or group level. This information should be recorded on F7-2 *Pool observation record* and/or F7-1 *Daily progress record*.

G-6: SETTING UP A PRIMARY CARE FACILITY

1. Purpose and scope

This document provides guidelines for setting up a primary care facility (PCF) for the oiled wildlife response to a marine pollution event.

This information is adapted from the NSW Department of Primary Industries Procedure: *Oil Chemical Spill Wildlife Response Set up and Use of Wildlife Treatment Facilities, 6 MARCH 2012 Reference: INT12/29111.*

2. Identifying the need for a PCF

In consultation with the DBCA Oiled Wildlife Advisor, the Wildlife Coordinator is responsible for identifying and advising the IMT of the need for a PCF. It is then the responsibility of the Logistics Section to source suitable existing facilities or to arrange the establishment of temporary facilities. This may require additional discussion with other Functional Areas.

Establishment of a PCF will be the responsibility of the Logistics section of the IMT. They will be assisted by operational support from the Wildlife Unit, as directed by the Operations function of the IMT, to achieve the functional establishment of the facilities.

3. Establishing a PCF – general requirements

3.1 Location

Facilities should be located as close as possible to the field of operations, preferably within one hour of travelling time, and should be available for an extended period (possibly months, depending on the scale of the operation). Options may include use of temporary facilities set up in existing buildings (preferably by prior arrangement), or mobile units/tents erected in an appropriate area.

Ideally, facilities for the collection, holding and isolation of affected animals should be established within 24 hours of the spill; this will generally occur through the establishment of an oiled wildlife field station. The PCF enables the more effective care of wildlife and provides the necessary infrastructure for cleaning and rehabilitation facilities. Ideally this facility should be operational within 72 hours.

3.2 Infrastructure

The following infrastructure will be required for a fully functional PCF (Figure G-6-2):

- Parking and laydown area: adequate and easy access for unloading animals, placing equipment and facilitating waste disposal;
- Water - access to an unlimited supply of heated fresh water. A water flow capacity reaching 60,000 L/day will be required for a centre dealing with 100 to 500 wildlife casualties at any one time. It takes approximately 600L of water to clean a heavily oiled seabird, and additional water is required for pools, general cleaning, showers, food preparation etc.;
- Ventilation - facilities must be adequately ventilated for the health and safety of humans and wildlife. Indoor animal holding areas must achieve a minimum of 10-15 air exchanges per hour to minimise petroleum fume effects and reduce risk of airborne diseases (especially aspergillosis);
- Heating/cooling – animal holding facilities and pools must be able to be heated/cooled as required;
- Communication – good mobile phone coverage and wireless communications systems are essential;

- Services – gas (preferably gas instantaneous hot water situated away from combustible fume areas) and electricity services must be accessible - preferably a mains supply, however large generators may be the only alternative in isolated locations. An electrical load of at least 800A (220V/ 3 phase) will be required for a centre dealing with 100 to 500 wildlife casualties;
- Security – it must be possible to secure facilities from both people and animals (e.g. dogs, cats, foxes, raptors and vermin);
- Accommodation and service providers – the PCF must be located within a reasonable distance of accommodation and other ancillary services required to support personnel.

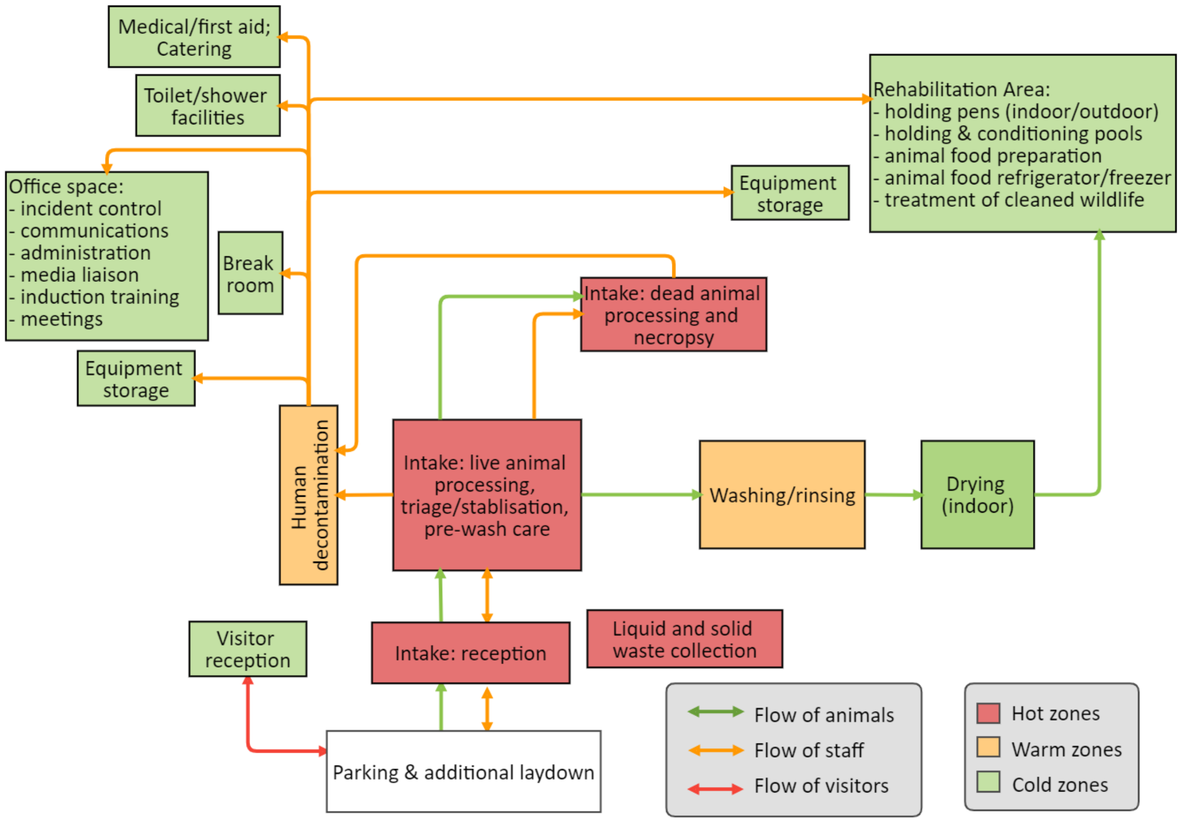


Figure G-6-1: Simplified work flow for a fully functional PCF

3.3 Functional design

A fully operational PCF has several diverse functional areas which address personnel safety, wildlife security, biohazard containment, waste management, animal husbandry and welfare. It is also likely to be a hub for public and media interest which will need to be managed in the facility design.

The functionality of the PCF will develop over several days or weeks. The initial emphasis is to rapidly provide for the intake, short-term holding and feeding of oiled wildlife, and general support for staff. Subsequent emphasis will be on cleaning areas (with associated water and electrical needs) and pools and pens for long-term animal holding.

A simplified work flow for the established PCF is illustrated in Figure G-6-1. The facility is divided into “hot”, “warm” and “cold” zones: hot zones are areas where oiled animals/material is present, and includes reception, intake processing, pre-wash care, washing and necropsy. Cold zones are areas where oil is not present and includes drying areas, post wash care, rehabilitation areas and rest areas for personnel. “Warm” zones are areas where there is a transition from hot to cold zones, such as personnel decontamination areas and cleaning containers.

An indicative layout for a PCF is shown in Figure G-6-2. This diagram illustrates the necessary provision of essential services and infrastructure to the various parts of the PCF.

3.4 Space requirements

Space requirements will depend on the numbers and species of animals affected. As a rough guide, if all the required facilities were to be co-located, the following space would be needed for an incident involving 500 oiled wildlife casualties:

3,000 m^2 of indoor space to accommodate:

- wildlife holding rooms for 500 wildlife casualties (approx 900m^2). This will be dependent on the animals involved – see Table G-6-1 for suggested minimums)
- wildlife cleaning (approx 240m^2)
- wildlife food preparation and storage (approx 180m^2)
- wildlife intake, live animal processing and dead animal processing
- personnel facilities (ablution, dining, first aid) and administration (IT, meetings, communications, training)

2,000 m^2 of outdoor space to accommodate:

- 6 pools (@5x3m)
- miscellaneous holding enclosures
- wash down area
- space for parking vehicles/equipment
- waste storage (see below)

3.5 Waste management

The cleaning process for oil or chemical affected wildlife produces large amounts of contaminated waste which requires disposal. This includes but is not limited to:

- contaminated water from washing and rinsing animals
- pool water (pools will require continuous skimming)
- contaminated towels, rags, paper, transport boxes etc.
- used syringes, gloves, coveralls
- medical waste (sharps, biological material)
- carcasses
- plastics, food scraps and other wastes from human activities.

Temporary storage will be required on-site for the different waste products. Ongoing close liaison with the Waste Management Unit is required to ensure appropriate management and collection of wastes.

Dead wildlife poses a contamination and health risk to other wildlife and to humans. Immediate refrigeration is recommended. Following post mortem examination, carcass storage or disposal may be undertaken – see P-5ii of this Manual. Consultation should be undertaken with local councils and relevant waste management authorities to ensure proper disposal of carcasses.

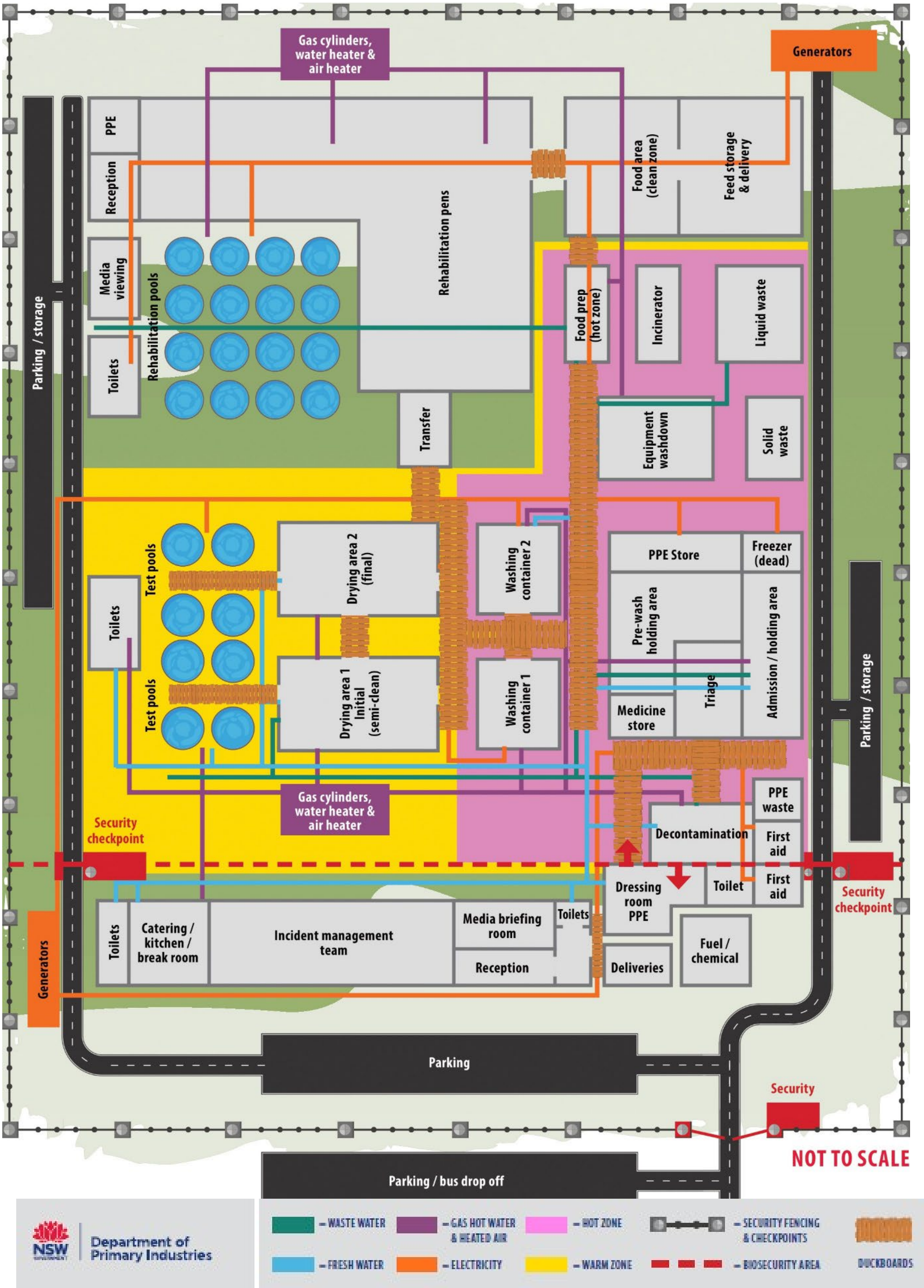


Figure G-6-2: Floor plan and servicing for a fully functional PCF (courtesy NSW Department of Primary Industry and the Environment; reproduced with permission)

3.6 Biosecurity

When animals are confined in close proximity to each other there is an increased risk of the spread of disease from animal to animal or to/from humans. The PCF infrastructure needs to support excellent hygiene principles for humans and animal care as outlined in G-2 *Biosecurity in oiled wildlife response*.

4. Requirements of specific areas

4.1 Wildlife admissions/reception

The admissions area needs to be readily accessible to the car park. It should be large enough to accommodate desks for several people and have space to accommodate numbers of boxes and crates. The temperature should be maintained at around 25 °C.

4.2 Intake – live and dead animal processing

If possible, live and dead animal processing should be in separate areas, away from the main activity and noise. Live animal triage should ideally be located between the admissions areas and the rehabilitation area. The post mortem facility should be separate from areas where live animals are held and processed, and separate from human rest areas. Live and dead animal processing will generate large amounts of waste and should have ready access for waste disposal collection.
If built facilities are not available, large marquees (at least 4m x 4m) should be erected.

In addition to holding space for animals, the live animal intake area will require:

- enough working space for up to 5 first-aid teams for a large incident (e.g. involving more than 50 pelican-sized animals); each team consisting of a veterinarian plus a vet nurse or an experienced wildlife rehabilitator. Each team needs a treatment table and there must be a common storage area for drugs and equipment (NOTE: restricted drugs such as euthanasia solution will require storage in lockable cupboards accessible only to veterinary personnel);
- individual holding pens for animals awaiting treatment; separate pens for animals in pre-wash care or requiring intensive care.
- access to refrigerators and freezers for storage of oil sample evidence and blood samples (NOTE: cold storage used for evidence samples and restricted drugs must be lockable);
- a small bench space to be used as a laboratory for blood sample processing.

The dead animal processing area will require:

- access to refrigerators and freezers for storage of carcasses and samples (NOTE: cold storage used for evidence and restricted drugs must be lockable).
- tarpaulins for containing waste runoff (or if indoors, good drainage)
- hoses for cleaning
- hot and cold running water

4.3 Cleaning Facilities

Washing and drying facilities should be located adjacent to one another. The cleaning facility should be indoors or under cover (tent, shed, etc.), however if the weather is warm and fine, animals can be washed outside during the day providing there is shade or shelter (and under lights at night).

Self-contained mobile oiled wildlife washing units (*DWYERtech Response Ltd*) are maintained by AMSA, AMOSC and DoT for deployment in the event of a large OWR. These are equipped with water heaters, a water softener, a pressurization pump, ventilation plant and electrical distribution board, plus a large working area with water outlets, ducted air extraction, lighting and floor drainage. A unit can run up to three cleaning stations and has sufficient water capacity to run four more wash stations in an adjacent facility. While these units are an excellent and very effective mobile option for cleaning wildlife, they require considerable infrastructure (external power and water sources; waste storage or disposal capacity) to be functional. The technical specifications of the *DWYERtech Response Ltd* units are as follows:

Weight:	Max Gross - 4500kg	Tare - 2185kg	Net - 2315kg
Dimensions:	Length - 19ft	Width – 8ft	Height – 8ft
Power type:	15 Amp power via mains or generator (generator needs to be at least 3.5kVa)		

In the absence of a mobile unit, washing facilities should be large enough to accommodate several large sinks or tubs positioned at waist height, several large washing tables and several rinsing stations with sufficient working space at each one to allow at least 2 people per animal. Suitable containers are required near the cleaning facility to store contaminated waste water and used towels, pending appropriate disposal.

The drying facility for wildlife should be indoors or in a closable tent or space that can be heated to about 28°C. The facility needs to be large enough to accommodate drying pens which, in combination with warm air blowers, provide a suitable environment for most birds. P-6 of this Manual contains further details of cleaning and drying techniques.

4.4 Rehabilitation housing

The specifics of rehabilitation housing will be highly dependent on the species being cared for. Broadly speaking, it will consist of pools, indoor facilities and outdoor facilities. All facilities must be escape-proof, maximise safety for the species being held and minimise visual and auditory distress. They should be located away from areas of human activity. They need to be able to be divided so that different species and animals in different states of health and condition can be kept separate from one another. Holding pens must be well-ventilated. If not temperature-controlled, heat lamps and cooling devices must be used to enable the regulation of temperature suitable to the species.

In all cases, expert advice should be sought from rehabilitators and veterinary staff to address the housing needs of wildlife, but guidelines are provided below and in Table G-6-1.

4.4.1 Pools

Most aquatic animals will need access to water within their enclosure. Pools should be large enough for animals to express natural behaviour and facilitate observation, but small enough to facilitate cleaning and animal capture. Pools must also be secured with netting or similar materials to prevent escape and deter predators.

Children's swimming pools can be used for smaller species like ducks, gulls and terns. Larger pools are required for birds such as gannets, albatrosses and swans; these can be constructed from plywood with heavy duty plastic as a lining, or above-ground swimming pools may be used. Access ramps in and out of the water should be provided to prevent the risk of waterlogged birds drowning. Pools for aquatic birds should be deeper than 50cm.

For an anticipated patient load of 100 birds, it will be necessary to have one or two large pools for testing of waterproofing. Each pool should be approximately 10m in diameter.

Water quality monitoring, filtering and treatment will be a necessary part of maintenance. The decision on whether to use salt or fresh water will depend on the species being rehabilitated (see P-7 of this Manual for more information). Expert advice should be sought from rehabilitators and veterinary staff familiar with the needs of aquatic wildlife.

Table G-6-1 A guide for minimum enclosure sizes for aquatic birds (adapted from Code of Practice for Wildlife Rehabilitation in Western Australia, *March 2020, which also contains standards for terrestrial avian species, mammals and reptiles)*

Species	**Intensive or high needs care (WxLxH)**	**Pre-release care (WxLxH)**	**Pool surface area (sqm)**	Pool minimum depth (cm)	**No. of birds**	**Codes**
Duck, Moorhens, Coots, Grebe	40x40x40cm	2x4x1.75m Alternative: 4.3m round gazebo style	1	50	2	AP AW FP H ON PT
Darter, Cormorant	42x67x48cm	2x2x1.75m	1	50	1	
Stilt, Egret, Heron, Spoonbill	42X67x48cm	2x2x1.75m	1	50; graduated	1	AG AW ST
Oystercatchers, Dotterel, Plover	32x32x32cm	1.5x1.5x1.75m	1	25; graduated	1 small or 2 large	AW
Swan	70x70x70cm	2x2x2m	2.4	60	2	AP PT
Pelican	1.2x1.2x1.2m	3x3m Alternative:3x9m round gazebo style	3	70	1 small or 2–3 large	AP PT SO ST
Little penguin	40x40x40cm	3x3m	2.4	30	3	AG AP H SO
Small seabirds (e.g. terns and seagulls)	40x40x40cm	2x2x1.75m	1	30	2	N PP PT
Albatross Giant petrel	70x70x70cm	2.5x2.5m	2.7m x 3.3m	**70;** walls 60cm above depth of pool	1	AG N PP PT SO

Key:

AG	Can be extremely aggressive, even with conspecifics. Use caution and observe the birds' interactions when introduced, before housing together and leaving unattended.
AP	Require aviaries that contain pools to swim in and suitable standing/perching surfaces.
AW	Require aviaries that contain shallow wading pools and a variety of perches, including some high perches.
FP	Provide as much wading area (in addition to a 'swimming' pool) as possible to help prevent foot injuries \
H	Provide natural vegetative material or human-devised areas for cover.
N	Should be housed on tightly stretched, suspended netting as a substrate whenever bird is not in water.
ON	When in intensive care and/or not standing, house on suspended net/shade cloth to protect feathers and keel. If it can stand normally and the keel is not extremely pronounced, housing substrate can be a towel or matting.
PP	Only require pool space during pre-release conditioning. Prior to release individuals must be able to stay in a pool full-time without a haul-out area, for a minimum of 48 hours without compromise to their waterproofing.
PT	Should be allowed pool time for as long and as often as their medical condition allows.
SO	A surface overflow of the pool is required to maintain water quality.
ST	Have stiff tail feathers. Provide with a stump or stump-like perch to avoid feather breakage and soiling.

4.4.2 Indoor housing for birds

Table G-6-1 provides a guide to indoor housing enclosure dimensions for aquatic birds. Gregarious species should be exposed to members of the same species or family and a pen measuring 2.5 x 2.5 metres can hold up to 10 medium-sized gregarious birds. The temperature should be maintained at around 25-28°C. As birds become stronger, temperatures can be matched to outside temperatures in preparation for moving them to outdoor housing.

Indoor enclosures can be constructed of cloth or canvas/ tarpaulin-covered wire, plywood or fibreglass. Hessian and jute materials should NOT be used. Netting or shade cloth can be used to cover the top of the pen. Uncovered bird wire can cause damage to wild birds and should be used with caution.

Indoor bird enclosures can be constructed in all shapes and sizes but must:
- be large enough to allow birds to stand up and stretch wings and neck freely;
- have no sharp protrusions inside or out;
- protect the animal from rain, draughts and predators;
- allow for adequate ventilation and light;
- contain appropriate food and water;
- be able to be cleaned easily to prevent disease;
- have suitable flooring that will not damage the birds' feet.

4.4.3 Outdoor housing for birds

Outdoor facilities are required for birds that need to build up condition and muscle tone and regain waterproofing. These facilities need to be larger than the indoor facilities and should consist of an appropriate number of enclosures/cages with water access.

Housing should be large enough to allow birds to stretch and flap their wings (except for birds such as albatrosses, gannets or boobies which are unlikely to fly in captivity), but not so large that regular capture and cleaning are difficult. The design must be escape-proof and protected from predator access. Suitable sizes and suggested holding capacity are outlined in Table G-6-1.

Depending on species, the following should be provided:
- high perches for species such as sea-eagles, bitterns and herons
- submerged logs and perching branches for ducks, cormorants and darters
- artificial burrows on land for penguins
- emerging rocks for smaller waders and some ducks.

4.4.4 Housing for pinnipeds (seals and sea lions)

Generally marine mammals do not require indoor housing. For individual animals considered to need indoor housing (sick or emaciated individuals), ensure good security, access passageways and 1m wide gates to enable safe access for handling of the animals.
Outdoor housing requirements will vary depending on the species and age but as a guide, pinnipeds would require:
- a large secure pen (3.4 x 2.1m) consisting of a pool and haul-out areas;
- a pool area of at least 16m^2 surface area and a depth of at least 0.5m;
- visual barriers to minimise stress;
- floor covered with a pallet of smooth moulded plastic slats or non-slip rubber;
- adequate shade/shelter from weather.
- all surfaces able to be cleaned with a pressure hose;
- localised heat source (e.g. infra-red lamp) should be available if required.

4.4.5 Housing for turtles

Turtles that can swim must be held in a pool that allows plenty of room to swim and dive, but also contains rafting platforms. Marine turtles can cope well with exposure to freshwater (at the right temperatures) for up to 6 days, but where possible, a gradual conversion to salt water should occur (see P-7 of this Manual). Chlorine can be added at less than 1ppm to reduce bacterial and algal growth, but higher levels will irritate the eyes. Water temperature must be maintained between 25-29.5°C for rehabilitation.

Overcrowding can lead to biting among Loggerhead, hawksbill and flatback, so separation is required. Green turtles are not usually aggressive to other turtles.

4.5 Food Preparation Area

Provision needs to be made for feeding wildlife during rehabilitation and this will require:

- storage facilities for several days' worth of food, unless daily supplies can be guaranteed;
- refrigerators, freezers and airtight containers (some animals will need fresh food);
- tables for food preparation;
- sinks with cold and hot running water;
- shelves to store buckets, medications, food dishes, knives and serving utensils;
- garbage bins.

4.6 Laundry Facilities

Towels and cloths used for cleaning and drying animals or lining small cages need to be washed between uses. It is more convenient if this can be done on site, especially during a large-scale response, and will require access to commercial washers and dryers. Separate facilities will be required for washing personnel clothing. If it is not feasible to set up laundry facilities, access will be required to a commercial laundry company nearby.

WA OWR MANUAL

SECTION 3: TEMPLATE FORMS AND LABELS

Department of Biodiversity, Conservation and Attractions

GOVERNMENT OF WESTERN AUSTRALIA

F1-1 OILED WILDLIFE RECONNAISSANCE: OBSERVATION RECORD

Incident name:	**Page __________ of __________ for this location and date**
Division:	**Date:**
Location Name:	**Time Start:** **Time End:**
Sector: **Segment:**	**Observer/s:**
GPS Start: **GPS End:**	**Survey method (circle)** foot land vehicle sea vessel aircraft

1. FAUNA OBSERVATIONS Complete a line entry per individual animal or groups of the same species in the same location.

Species Common Name (if known) or taxon key [A]	No. of Animals			No. oiled (or % if large numbers)	Behaviour [B]	GPS Coord. Lat/Long	Fine scale Location [C]	Animal status (e.g. sex, age, size) and Other Comments
	Live	Dead	Total					
								CONTINUED OVERLEAF

[A] **B=bird (BS = seabird; BSh = shorebird; BW = wading bird; BO= other); M = mammal (MC= cetacean; MP= pinniped [seal or sealion]; MO= other); R = reptile (RT = turtle; RO = other); O = other**

[B] **Behaviour Key (use as many as required): F** = foraging/feeding; **FL** = flying; **M** = mating; **N** = nesting; **R** = resting/roosting; **S** = swimming; **W** = wading; **WK** = walking

[C] **e.g. shoreline, surf zone, dunes, concealed in vegetation**

F1-1 OILED WILDLIFE RECONNAISSANCE: OBSERVATION RECORD (cont.)

2. FLORA, NESTS AND OTHER HABITAT OBSERVATIONS

Record observations of nests, other signs of fauna habitation, flora or habitat threats or considerations relevant to clean-up operations, either due to presence of oiling or need for care during clean-up.

Observation of (Tick which applies)					
Nest (insert species if known)	**Flora (insert species if known)**	**Habitat**	**Oiled (Y/N)**	**GPS Coord. Lat/Long**	**Observation/comment**

[A] **B=bird (BS = seabird; BSh = shorebird; BW = wading bird; BO= other); M = mammal (MC= cetacean; MP= pinniped [seal or sealion]; MO= other); R = reptile (RT = turtle; RO = other); O = other**

[B] **Behaviour Key (use as many as required): F =** foraging/feeding; **FL** = flying; **M** = mating; **N =** nesting; **R** = resting/roosting; **S** = swimming; **W** = wading; **WK** = walking

[C] **e.g. shoreline, surf zone, dunes, concealed in vegetation**

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F2-1 OILED WILDLIFE PREVENTATIVE ACTIONS: OBSERVATION RECORD

Incident name:	**Page __________ of __________ for this location and date**
Division:	**Date:**
Location Name:	**Time Start:** **Time End:**
Sector: **Segment:**	**Observer/s:**
GPS:	

PREVENTATIVE ACTION: (circle) Pre-emptive capture Hazing/deterrence
REASON FOR PREVENTATIVE ACTION:
METHOD/S USED:
SPECIES TARGETED:

FAUNA OBSERVATIONS

Complete a line entry per individual animal or groups of the same species.

Time of Observation	Species (if known) or taxon key [A]	No. of Animals	No. oiled (or % if large numbers)	Behaviour [B]	Effects of preventative action (e.g. number captured; effect of deterrence/hazing)

CONTINUED OVERLEAF

[A] **B=bird (BS = seabird; BSh = shorebird; BW = wading bird; BO= other); M = mammal (MC= cetacean; MP= pinniped [seal or sealion]; MO= other); R = reptile (RT = turtle; RO = other); O = other**

[B] **Behaviour Key (use as many as required): F =** foraging/feeding; **FL** = flying; **M** = mating; **N** = nesting; **R** = resting/roosting; **S** = swimming; **W** = wading; **WK** = walking

F2-1 OILED WILDLIFE PREVENTATIVE ACTIONS: OBSERVATION RECORD (cont.)

Time of Observation	**Species (if known) or taxon key [A]**	**No. of Animals**	**No. oiled (or % if large numbers)**	**Behaviour [B]**	**Effects of preventative action (e.g. number captured; effect of deterrence/hazing)**

[A] **B=bird (BS = seabird; BSh = shorebird; BW = wading bird; BO= other); M = mammal (MC= cetacean; MP= pinniped [seal or sealion]; MO= other); R = reptile (RT = turtle; RO = other); O = other**
[B] **Behaviour Key (use as many as required): F =** foraging/feeding; **FL** = flying; **M** = mating; **N =** nesting; **R** = resting/roosting; **S** = swimming; **W** = wading; **WK** = walking

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F3-1 OILED WILDLIFE RESCUE – COLLECTION RECORD

Incident name:	**Page __________ of __________ for this location and date**
Location Name:	**Date:**
Sector: **Segment:**	**Rescue team member/s:**

Complete a line entry per individual animal:

	Time	**GPS (N/S)**	**GPS (E/W)**	**Species (if known) or taxon key***	**Status (L=live; D=dead)**	**Comments**
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

* **<u>B=bird</u> (BS = seabird; BSh = shorebird; BW = wading bird; BO= other); <u>M = mammal</u> (MC= cetacean; MP= pinniped [seal or sealion]; MO= other); <u>R = reptile</u> (RT = turtle; RO = other); <u>O = other</u>**

L3-1 OILED WILDLIFE RESCUE – COLLECTION TAG

Animal Collection Tag: ☐ Live ☐ Dead ☐ Oiled

Collection Date: ______________ Time: __________

Species ____________________________________

Location: ___________________________________

GPS Coords: _________________________________

Collector name(s): ____________________________

☐ Threatened/Endangered ☐ Urgent medical attention

Animal Collection Tag: ☐ Live ☐ Dead ☐ Oiled

Collection Date: ______________ Time: __________

Species ____________________________________

Location: ___________________________________

GPS Coords: _________________________________

Collector name(s): ____________________________

☐ Threatened/Endangered ☐ Urgent medical attention

Animal Collection Tag: ☐ Live ☐ Dead ☐ Oiled

Collection Date: ______________ Time: __________

Species ____________________________________

Location: ___________________________________

GPS Coords: _________________________________

Collector name(s): ____________________________

☐ Threatened/Endangered ☐ Urgent medical attention

Animal Collection Tag: ☐ Live ☐ Dead ☐ Oiled

Collection Date: ______________ Time: __________

Species ____________________________________

Location: ___________________________________

GPS Coords: _________________________________

Collector name(s): ____________________________

☐ Threatened/Endangered ☐ Urgent medical attention

Animal Collection Tag: ☐ Live ☐ Dead ☐ Oiled

Collection Date: ______________ Time: __________

Species ____________________________________

Location: ___________________________________

GPS Coords: _________________________________

Collector name(s): ____________________________

☐ Threatened/Endangered ☐ Urgent medical attention

Animal Collection Tag: ☐ Live ☐ Dead ☐ Oiled

Collection Date: ______________ Time: __________

Species ____________________________________

Location: ___________________________________

GPS Coords: _________________________________

Collector name(s): ____________________________

☐ Threatened/Endangered ☐ Urgent medical attention

Animal Collection Tag: ☐ Live ☐ Dead ☐ Oiled

Collection Date: ______________ Time: __________

Species ____________________________________

Location: ___________________________________

GPS Coords: _________________________________

Collector name(s): ____________________________

☐ Threatened/Endangered ☐ Urgent medical attention

Animal Collection Tag: ☐ Live ☐ Dead ☐ Oiled

Collection Date: ______________ Time: __________

Species ____________________________________

Location: ___________________________________

GPS Coords: _________________________________

Collector name(s): ____________________________

☐ Threatened/Endangered ☐ Urgent medical attention

F4-1 INDIVIDUAL ANIMAL CHAIN OF CUSTODY RECORD

Animal ID (assigned at admission):	**Species (if known)**
Date (DD/MM/YY) and time collected:	**Collected by (Print name and sign)**

DATE	RELINQUISHED BY (print name)	RELINQUISHED BY (signature)	RECEIVED BY (print name)	RECEIVED BY (signature)

F4-2 OILED WILDLIFE ADMISSION LOG

Date (begin a new page at the beginning of a new day)	FACILITY NAME/LOCATION (use a separate log for each field station or primary care facility)	FACILITY CODE (1-2 letter abbreviation):

ARRIVAL at facility						RESCUE DETAILS (complete for **new admissions only**; transfer from collection tag)				DEPARTURE from facility			
	Transfer (T) or new admission (N)	Animal ID[1]	Arrival Time	Arrival Status[2]	Species	Rescue Date	Rescue Time	Rescue Location (incl GPS if known)	Rescuer Initials[2]	Date	Status[3]	Transfer (T) or release (R)	Transfer/release destination
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

1: For new admissions: Facility code plus three digit number starting at 001 e.g. F001 (continuous numbering throughout incident for new admissions at each facility). For transfers: copy Animal ID from CoC paperwork; 2: insert “U” if unknown; 3: DOA = dead on arrival; D= died; E = euthanased; L = live.

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F4-3 OILED WILDLIFE LIVE ANIMAL ASSESSMENT

ANIMAL ID ____________________

ANIMALL DETAILS	Band (#/colour): *e.g. F001/P*	Species:	
	Age: juv subadult adult unk	Sex: male female unk	
PROCESS	Admission Date/time:	Evidence collected: ☐ photo/s ☐ feathers/fur/oil swab	
	Site/facility:		
INITIAL EXAMINATION		Date/Time:	
Weight (g) ___________ actual/estimated Body condition *(circle)* emaciated 1 2 3 4 5 obese curved carapace length (turtles): ________ mm		Demeanour: ☐ bright ☐ quiet ☐ weak ☐ unresponsive Body temperature: °C	
% Oiled: <2% 2-25% 26-50% 51-75% 76-100%		Oiling depth: ☐ Surface ☐ Moderate ☐ Deep	

Systems checklist	Oiled? (tick if yes)	Other findings **(*NSF = no significant findings; NE = not examined*):**
Eyes/ears		NSF NE
Mouth/nares		NSF NE
Skin/feathers/shell/fur		NSF NE
Hocks/legs/feet		NSF NE
Vent/anus		NSF NE
Musculoskeletal	NSF NE	
Respiratory	NSF NE	
Cardiovascular	NSF NE	
Neurological	NSF NE	
Gastrointestinal	NSF NE	
Comments		

TRIAGE EVALUATION (tick) : ☐ **PRIORITY 1** ☐ **PRIORITY 2** ☐ **PRIORITY 3**	Examiner initials:

DIAGNOSTICS

Date/time	PCV:	%	TP	g/L
Date/time	PCV:	%	TP	g/L

FIRST TREATMENT *see P4 and G5 of Manual. Gavage by trained personnel only, & not within 30 min of transport.*

Tick	**Type**	**Route**	**Product details, amount, time**	**Initials**
	Fluids (see G5): BIRDS oral -25ml/kg first dose, then 50ml/kg every 90 min			
	Itraconazole (see A4 for dose rates)	PO		
	Eye lubricant or ointment	Ophth		
	Other			
	Thermal support (describe)			
	Bandaging (describe)			

SPECIES ____________

BAND (#/COLOUR) ____________

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F4-3

CASE SUMMARY

Problems		
Date Observed	**Problem**	**Date Resolved**

PRESCRIPTIONS

Medication and concentration (mg/tablet or mg/ml)	Dose	Route	Frequency	Start Date	End Date	Prescriber Initials

DISPOSITION

☐ Transferred ☐ Died ☐ Euthanased ☐Released Date and time:

<u>If transferred</u>: Transfer to: Name of transferring staff:

<u>If euthanased</u>: Method (include volume If pentobarbitone):

☐ euthanasia noted on facility admissions log/s Euthanased by (initials):

<u>If released</u>: details of any release ID (microchip #; ABBBS band #)

F4-4 ANIMAL TRANSPORT LOG

Vehicle Registration: ____

Date	**Time**	**Origin**	**Destination**	**Odometer Start**	**Odometer End**	**Distance (km)**
IDs of animal being transported (list):						
☐ Chain of custody transferred			Signature:			

Date	**Time**	**Origin**	**Destination**	**Odometer Start**	**Odometer End**	**Distance (km)**
IDs of animal being transported (list):						
☐ Chain of custody transferred			Signature:			

Date	**Time**	**Origin**	**Destination**	**Odometer Start**	**Odometer End**	**Distance (km)**
IDs of animal being transported (list):						
☐ Chain of custody transferred			Signature:			

Date	**Time**	**Origin**	**Destination**	**Odometer Start**	**Odometer End**	**Distance (km)**
IDs of animal being transported (list):						
☐ Chain of custody transferred			Signature:			

Total km this page: ____________________

Signature: ________________________________

CHAIN OF CUSTODY

ChemCentre, Building 500 Resources and Chemistry Precinct,
Post: PO Box 1250, Bentley Delivery Centre WA 6983
PH: (08) 9422 9800 **FAX**: (08) 9422 9801 **Email**: ssd@chemcentre.wa.gov.au

ChemCentre EXPERT SOLUTIONS

GOVERNMENT OF WESTERN AUSTRALIA

Off Conlon Street, BENTLEY WA 6102

PAGE No: _____ **of** _____

COURIER NAME: ………………………………………… CON NOTE No: …………………………	**NOTES:**	*Analysis Required*	**ChemCentre Job No:**
CLIENT (Billing): ADDRESS:			
CLIENT P/O No: ………………………………			
SAMPLED BY: ………………………………………………………………………………………………			

LAB ID	**SAMPLE ID / DESCRIPTION**	**Sample Type**	**DATE COLLECTED**	**TIME COLLECTED**							Comments/ Sampling Details

RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:

Continue over page if needed

RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:

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SPILL NAME: ______________________________

F5-2a

F5-2a WILDLIFE INTAKE – NECROPSY FORM - BIRDS

IDENTIFICATION

Animal ID # ____________________ **Other ID** ______________________

Species ________________________________ **Age** ☐ adult ☐ subad ☐ juv **Sex** □ M □ F □ undetermined

(circle) Found dead /euthanased/ died **Date of death** (dd/mm/yy) _____________________ □ actual □ est.

Frozen/thawed □ Yes □ No **Condition of carcass** □fresh; □ decomposed (circle): mild/moderate/advanced

Date necropsied ____________________ **Examiner/affiliation** _________________________________

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

Carcass disposition (tick & add details/location) □ frozen □ buried □ other ________________________

EXTERNAL EXAMINATION (* = priority information)

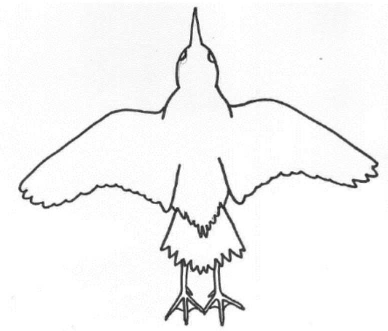
Body weight ____________ g □ actual □ est. Body condition score (*circle*): *emaciated* 1 2 3 4 5 *obese*

CODES: *Left* ***L***; *Right* ***R***; *Bill/beak* ***B***; *Carpus* ***C;*** *Digit* ***D1-5;*** *Dorsum* ***D;*** *Ears* ***Ea;*** *Eyes* ***E***; *Foot* ***F;*** *Head* ***Hd;*** *Keel* ***K***; *Neck* ***N;*** *Leg* ***LG;*** *Phalanx* ***P1-5;*** *Metacarpus* ***MC;*** *pectoral* ***Pec;*** *pelvis* ***Pv*** *Tail* ***T;*** *Uropygial gland* ***UPG;*** *Vent* ***V;*** *Wing* ***W***

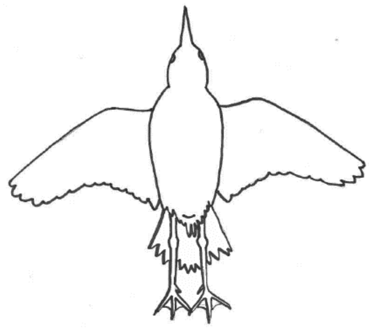
Tick if present; use diagrams and add anatomic codes, comments & corresponding photo numbers as required):

PATHOLOGY	*ANATOMIC CODE/S*	*COMMENTS*	*PATHOLOGY*	*ANATOMIC CODE/S*	*COMMENTS*
☐ Oil/tar*			☐ Crushing/bruising		
☐ Wounds/fractures			☐ Feather loss		
☐ Pressure injuries*			☐ Other		

DORSAL

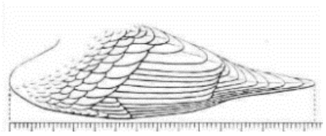


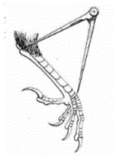
VENTRAL

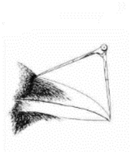


Morphometrics (mm):

1. Folded wing (see right)	
2. Tarsus length (see right)	
3. Beak length (culmen/nares to tip; see right)	
4. Beak depth	







SAMPLE SUMMARY (*See P-5ii for sampling procedures;* **** = priority samples.*** *See over for anatomic codes***)**

□ Samples for petrochemical analysis (tick): □ 5 heavily oiled feathers*, or equivalent weight (cut); □ Li □ Cr/Pr contents
(only collect internal samples for analysis if animal is freshly dead (<24h). Avoid contact of samples with plastic. Tissue samples min 50g, fluid min 5ml. Seal with evidence tape and label L5-1 "oil sample evidence" then freeze/refrigerate)

□ Photographs* (*include completed L5-3 "Photo evidence dead animal" label in first and last photo for each individual)*

□ Histopathology - (insert codes): ____

□ Frozen tissues for microbiology (insert codes): ____

□ Parasites in 70% ethanol (record anatomical location) ____

□ Other ____

NOTE: ***It is an offence under the Biodiversity Conservation Act 2016 to take native fauna, living or dead, without an appropriate licence. This includes necropsy sampling. Contact wildlifelicensing@dbca.wa.gov.au or the Wildlife Coordinator for further information.***

INTERNAL EXAMINATION		Tick & enter on sample summary p.1			
Organ (code in brackets)	**Description (NSF= no significant findings; NE = not examined)**	**Photo**	**Tissue fixed**	**Tissue Fresh**	**Petrochem. analysis**
Sensory Organs: Eyes (E)					
Ears (Ea)					
Nares (N)					
Oral cavity (tongue, beak, mouth					
Musculoskeletal: bone, muscle, joints, tendons					
Coelomic cavity (note presence of fluid; fat atrophy; haemorrhage; adhesions)					
Heart (Ht), pericardium, great vessels					
Trachea (Tr) & syrinx					
Lungs (Lu) & air sacs					
Liver (Li) & gall bladder					
Spleen (Spl)					
Pancreas (P)					
Lymph nodes (LN)					
Oesophagus (Oe),crop (Cr)					
Proventriculus (Pr)					
Gizzard (Gi)					
Small Intestine (SI)					
Colon (Co)					
Caecum (Cae)					
Cloaca (Cl), Bursa of Fabricius (BF					
Endocrine: Adrenals (Adr)					
Thyroid (Th), Parathyroid (PTh)					
Kidneys (Ki), ureters					
Testis (T)/Ovary (Ov)					
Oviduct (Ovd)					
Nervous system: Brain (Br), spinal cord (SC)					
Other notes					

***NOTE:** It is an offence under the Biodiversity Conservation Act 2016 to take native fauna, living or dead, without the appropriate licence. This includes necropsy sampling. Contact wildlifelicensing@dbca.wa.gov.au or the Wildlife Coordinator for further information.*

F5-2b WILDLIFE INTAKE – NECROPSY FORM – SEA TURTLES

IDENTIFICATION

Animal ID # ____________________ **Other ID** ______________________

Species ________________________________ **Age** ☐ adult ☐ subad ☐ juv **Sex** ☐ M ☐ F ☐ undetermined

(circle) Found dead /euthanased/ died **Date of death** (dd/mm/yy) ____________________ ☐ actual ☐ est.

Frozen/thawed ☐ Yes ☐ No **Condition of carcass** ☐fresh; ☐ decomposed (circle): mild/moderate/advanced

Date necropsied ____________________ **Examiner/affiliation** ________________________________

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

Carcass disposition (tick & add details/location) ☐ frozen ☐ buried ☐ other ________________________

EXTERNAL EXAMINATION (* = priority information)

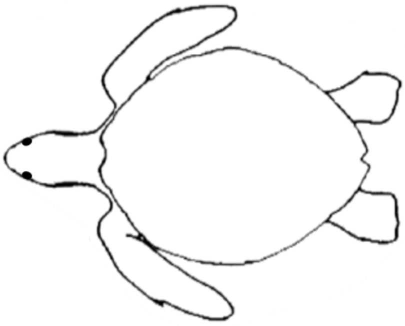
Body weight* ____________ ☐ actual ☐ est. Body condition score (*circle*): *emaciated* 1 2 3 4 5 *obese*

*CODES: Left **L**; Right **R**; Beak **B**; Carapace **C**; Ears **Ea**; Eyes **E**; Front flipper **F**; Head **Hd**; Hind flipper **H**; Neck **N**; Pectoral girdle **Pec**; Pelvis **Pv**; Plastron **P**; Tail **T**; Vent **V**.*

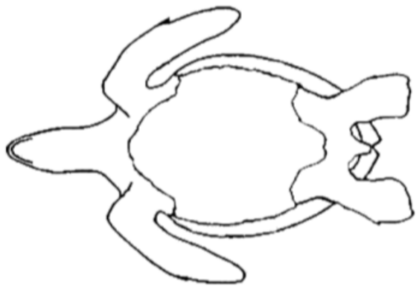
Tick if present; use diagrams and add anatomic codes, comments & corresponding photo numbers as required):

PATHOLOGY	*ANATOMIC CODE/S*	*COMMENTS*	*PATHOLOGY*	*ANATOMIC CODE/S*	*COMMENTS*
☐ Oil/tar*			☐ Fish hooks		
☐ Wounds/fractures			☐ Epibiota		
☐ Amputation/s			☐ Entanglement (current or former)		

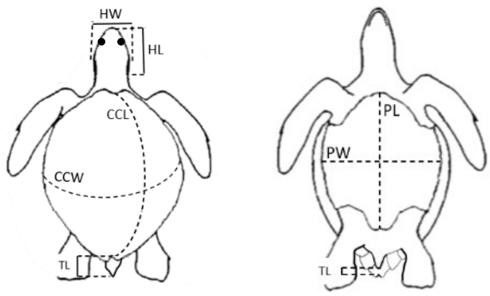
DORSAL



VENTRAL



Morphometrics (mm) – see adjacent diagrams	**Length (L)**	**Width (W)**
Curved carapace* (CCL, CCW)		
Head (HL, HW)		
Plastron (PL, PW)		
Plastron to tail (PT)		
Plastron to vent (PV)		
Tail length (TL)		



SAMPLE SUMMARY (*See P-5ii for sampling procedures; * = **priority samples.** See over for anatomic codes*)

☐ Samples for petrochemical analysis (tick): ☐ external oil sample;* ☐ stomach contents;*☐ Li *(NB only collect internal samples for analysis if animal is freshly dead (<24h). Avoid contact of samples with plastic. Tissue samples min 50g, fluid min 5ml. Seal with evidence tape and label L5-1 "oil sample evidence" then freeze/refrigerate)*

☐ Photographs* (*include completed L5-3 "Photo evidence dead animal" label in first and last photo for each individual)*

☐ Histopathology - (insert codes): ____

☐ Frozen tissues for microbiology (insert codes): ____

☐ Parasites in 70% ethanol (record anatomical location) ____

☐ Other ____

***NOTE:** It is an offence under the Biodiversity Conservation Act 2016 to take native fauna, living or dead, without an appropriate licence. This includes necropsy sampling. Contact wildlifelicensing@dbca.wa.gov.au or the Wildlife Coordinator for further information.*

INTERNAL EXAMINATION		Tick & enter on sample summary p.1			
Organ (code in brackets)	**Description (NSF= no significant findings; NE = not examined)**	**Photo**	**Tissue fixed**	**Tissue Fresh**	**Petrochem. analysis**
Sensory Organs: Eyes (E)					
Ears (Ea)					
Nares (N)					
Oral cavity (tongue, beak, mouth)					
Musculoskeletal: bone, muscle, joints, tendons					
Coelomic cavity (note presence of fluid; fat atrophy; haemorrhage; adhesions)					
Heart (Ht), pericardium, great vessels					
Trachea (Tr)					
Lungs (Lu)					
Liver (Li) & gall bladder					
Spleen (Spl)					
Pancreas (P)					
Lymph nodes (LN)					
Oesophagus (Oe)					
Stomach (St)					
Small Intestine (SI)					
Colon (Co)					
Caecum (Cae)					
Cloaca (Cl)					
Endocrine: Adrenals (Adr)					
Thyroid (Th), Parathyroid (PTh)					
Kidneys (Ki), ureters					
Bladder (B)					
Testis (T)/Ovary (Ov)					
Oviduct (Ovd)					
Nervous system: Brain (Br), spinal cord (SC)					
Other notes					

NOTE: *It is an offence under the Biodiversity Conservation Act 2016 to take native fauna, living or dead, without the appropriate licence. This includes necropsy sampling. Contact wildlifelicensing@dbca.wa.gov.au or the Wildlife Coordinator for further information.*

F5-2c WILDLIFE INTAKE – NECROPSY FORM – PINNIPEDS

IDENTIFICATION

Animal ID # ____________________ **Other ID** ______________________

Species ________________________________ **Age** ☐ adult ☐ subad ☐ juv **Sex** ☐ M ☐ F ☐ undetermined

(circle) Found dead /euthanased/ died **Date of death** (dd/mm/yy) _____________________ ☐ actual ☐ est.

Frozen/thawed ☐ Yes ☐ No **Condition of carcass** ☐fresh; ☐ decomposed (circle): mild/moderate/advanced

Date necropsied ____________________ **Examiner/affiliation** _________________________________

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

Carcass disposition (tick & add details/location) ☐ frozen ☐ buried ☐ incinerated ☐ other ________________________

EXTERNAL EXAMINATION (* = priority information)

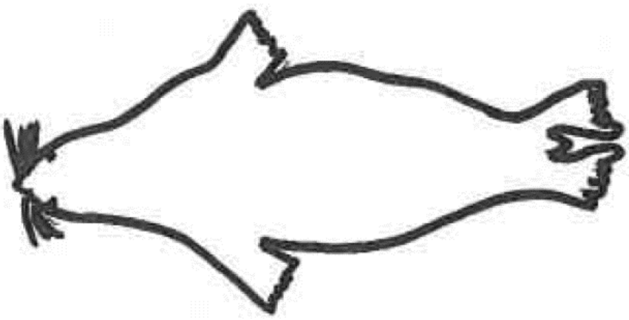
Body weight* ____________ kg ☐ actual ☐ est. Body condition score (*circle*): *emaciated* 1 2 3 4 5 *obese*

*CODES: Left **L**; Right **R**; Digits **D1**-5; Ears **Ea;** Eyes **E**; Foreleg **F;** Hindleg **H;** Head **Hd;** Neck **N;** Pectoral girdle **Pec**; Pelvis **Pv**; Phalanx **P1-5**; Tail **T***

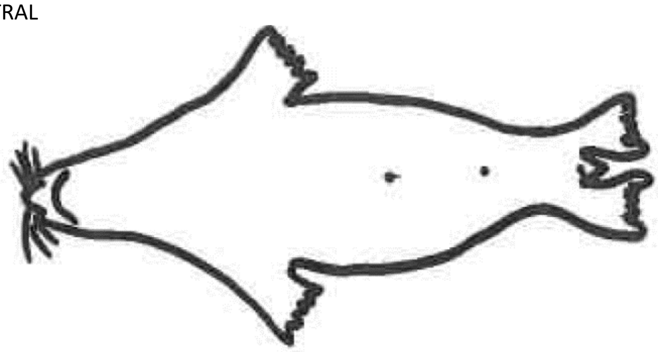
Tick if present; use diagrams and add anatomic codes, comments & corresponding photo numbers as required):

PATHOLOGY	*ANATOMIC CODE/S*	*COMMENTS*	*PATHOLOGY*	*ANATOMIC CODE/S*	*COMMENTS*
☐ Oil/tar*			☐ crushing/bruising		
☐ Wounds/fractures			☐ skin disease		
☐ Scars			☐ other		

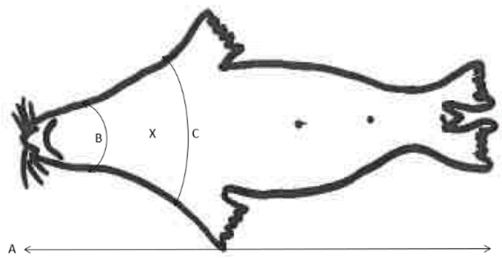
DORSAL



VENTRAL



Morphometrics* (cm) – see adjacent diagram	
Total length (A) – straight measure	
Girth at neck (B)	
Girth at pectoral flippers (C)	
Sternal blubber depth (X): Use vernier callipers and measure to the nearest 0.1mm perpendicularly from base of skin to surface of muscle	



SAMPLE SUMMARY (<u>*See P-5ii for sampling procedures; * = **priority samples.** See over for anatomic codes*</u>)

☐ External photographs* (*include L5-3 "Photo evidence dead animal" label in first and last photo for each individual*)

☐ Samples for petrochemical analysis (tick): ☐ external oil;* ☐ bile*; ☐ urine; ☐ blood ☐ stomach contents; ☐ blubber (*only collect internal samples for analysis if animal is freshly dead (<24h). Avoid contact of samples with plastic. Tissue samples min 50g, fluid min 5ml (except bile – no min volume). Seal with evidence tape and label L5-1 "oil sample evidence" then freeze/refrigerate)*

☐ Histopathology - (insert codes): ____

☐ Frozen tissues for microbiology (insert codes): ____

☐ Parasites in 70% ethanol (record anatomical location) ____

☐ Other ____

<u>NOTE:</u> It is an offence under the Biodiversity Conservation Act 2016 to take native fauna, living or dead, without the appropriate licence. This includes necropsy sampling. Contact wildlifelicensing@dbca.wa.gov.au or the Wildlife Coordinator for further information.

INTERNAL EXAMINATION		Tick & enter on sample summary p.1			
Organ (code in brackets)	**Description (NSF= no significant findings; NE = not examined)**	**Photo**	**Tissue fixed**	**Tissue Fresh**	**Petrochem. analysis**
Eyes (E)					
Ears (Ea)					
Nares (N)					
Oral cavity					
Musculoskeletal: bone, muscle, joints, tendons					
Mammary glands & subcutaneous lymph nodes					
Pleural cavity & thoracic lymph nodes					
Heart (Ht), pericardium, great vessels					
Thyroid (Th), Parathyroid (PTh)					
Trachea (Tr)					
Lungs (Lu)					
Abdominal cavity & visceral lymph nodes					
Liver (Li) & gall bladder (GB)					
Spleen (Spl)					
Pancreas (P)					
Oesophagus (Oe)					
Stomach (St)					
Small Intestine (SI)					
Colon (Co)					
Kidneys (Ki), ureters					
Bladder (B)					
Adrenals (Adr)					
Gonads:Testes (T)/Ovary (Ov)					
Reproductive tract					
Nervous system: Brain (Br), spinal cord (SC)					
Other notes					

NOTE: ***It is an offence under the Biodiversity Conservation Act 2016 to take native fauna, living or dead, without the appropriate licence. This includes necropsy sampling. Contact wildlifelicensing@dbca.wa.gov.au or the Wildlife Coordinator for further information.***

F5-2d WILDLIFE INTAKE – NECROPSY FORM – CETACEANS & DUGONGS

IDENTIFICATION

Animal ID # ____________________ **Other ID** ______________________

Species ________________________________ **Age** ☐ adult ☐ subad ☐ juv **Sex** ☐ M ☐ F ☐ undetermined

(circle) Found dead /euthanased/ died **Date of death** (dd/mm/yy) _____________________ ☐ actual ☐ est.

Frozen/thawed ☐ Yes ☐ No **Condition of carcass** ☐fresh; ☐ decomposed (circle): mild/moderate/advanced

Date necropsied ____________________ **Examiner/affiliation** _________________________________

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

Carcass disposition (tick & add details/location) ☐ frozen ☐ buried ☐ other ________________________

EXTERNAL EXAMINATION (* = priority information)

Body weight* ____________ kg ☐ actual ☐ est. Body condition score (*circle*): *emaciated* 1 2 3 4 5 *obese*

*<u>CODES</u>: Left **L**; Right **R**; Blowhole/s **B**; Dorsal surface **D**; Dorsal fin **DF**; Eye **E**; Genital slit **G;** Head **Hd**; Jaw-upper **UJ**; Jaw-lower **LJ**; Pectoral fin **PF**; Tail stock **T**; Tail fluke **TF**; Ventral/belly surface **V***

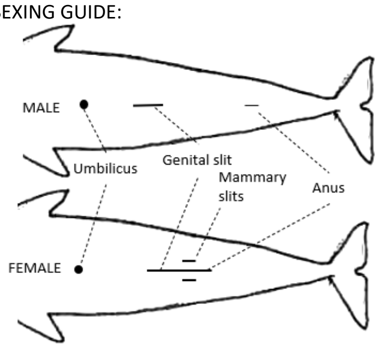
Tick if present; use diagrams and add anatomic codes, comments & corresponding photo numbers as required):

PATHOLOGY	*ANATOMIC CODE/S*	*COMMENTS*	*PATHOLOGY*	*ANATOMIC CODE/S*	*COMMENTS*
☐ Oil/tar*			☐ crushing/bruising		
☐ Wounds/fractures			☐ pressure injuries		
☐ Scars			☐ sunburn		
☐ epibiota			☐ other skin disease		

PHOTOS FOR IDENTIFICATION:

☐ Side views whole body, head & dorsal fin; ☐ top views pectoral fin & tail flukes; ☐ teeth/baleen ☐ genital slit & anus

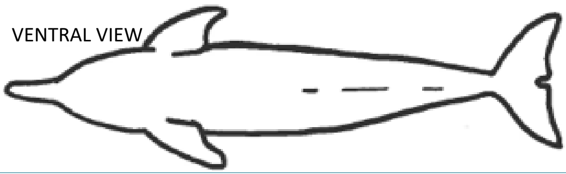
SEXING GUIDE:



LEFT SIDE

RIGHT SIDE

VENTRAL VIEW



SAMPLE SUMMARY (*<u>See P-5ii for sampling procedures; * = **priority samples.** See p.3 for anatomic codes</u>***)**

☐ External photographs* (*include L5-3 "Photo evidence dead animal" label in first and last photo for each individual)*

☐ Samples for petrochemical analysis (tick): ☐ external oil;* ☐ bile*; ☐ urine; ☐ blood ☐ stomach contents; ☐ blubber *(only collect internal samples if animal is freshly dead (<24h). Avoid contact of samples with plastic. Tissue samples min 50g, fluid min 5ml (except bile – no min volume). Seal with evidence tape, label L5-1 "oil sample evidence" then freeze or refrigerate)*

☐ Frozen blubber for genetics/stable isotopes* ☐ Frozen tissues for microbiology (insert codes): ________________________

☐ Histopathology - (insert codes): ____

☐ Parasites in 70% ethanol (record anatomical location) ____

☐ Other ____

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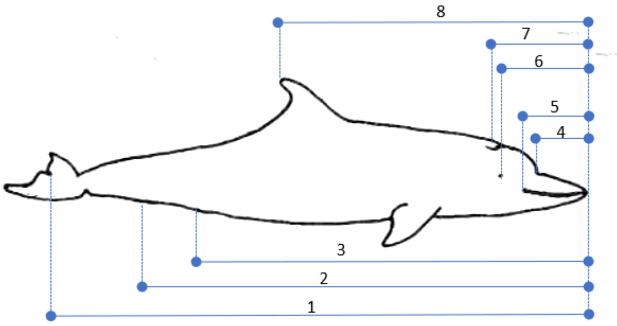
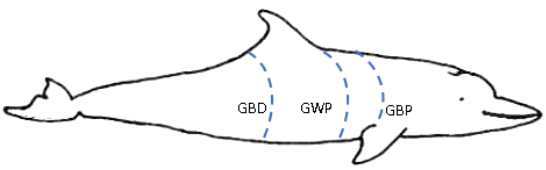
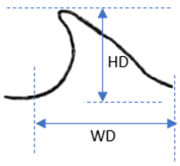
MORPHOMETRICS

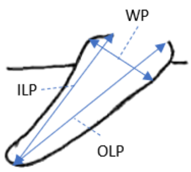
Measure on right side of body where possible. If taken on left side, please note. When measuring from blowhole, measure both sides if possible as some species have blowholes off centre. In species lacking a dorsal fin, take measurements from dorsal ridge. *Measurements are taken in a straight line*, i.e. raised off the body rather than curved along the body surface. Place a ruler perpendicular to the beak and start measuring from the ruler. If upper and lower jaw are different lengths, measure from the most rostral point. **Measurements marked * should be prioritised if there are constraints on time or resources.**

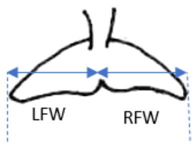


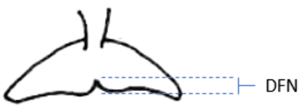
1. Total length	*
2. Beak tip to midpoint of anus	
3. Beak tip to midpoint genital slit	
4. Beak length	*
5. Beak tip to end of gape	
6. Beak tip to centre of eye	
7. Beak tip to centre of blowhole	
8. Beak tip to tip of dorsal fin	



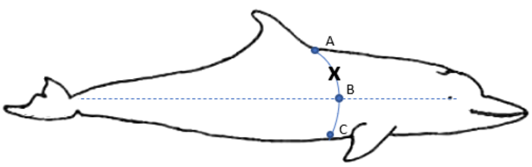








GWP	Girth at widest point	*
GBP	Girth behind pectoral fins	
GBD	Girth behind dorsal fin	
HD	height of dorsal fin	*
WD	width of dorsal fin	*
OLP	Outer length pectoral fin	*
ILP	Inner length pectoral fin	
WP	Max. width pectoral fin	*
LFW	Left fluke width	*
RFW	Right fluke width	*
DFN	Depth of fluke notch	*



<ins>Blubber measurements and sampling:</ins>

Use vernier callipers and measure to the nearest 0.1mm. perpendicularly from base of skin to surface of muscle at points A-C. Take blubber samples at Point X.

A:	B:	C:

<ins>Tooth counts*:</ins>

L upper		R upper	
L lower		R lower	

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INTERNAL EXAMINATION		Tick & enter on sample summary p.1			
Organ (code in brackets)	**Description (NSF= no significant findings; NE = not examined)**	**Photo**	**Tissue fixed**	**Tissue Fresh**	**Petrochem. analysis**
Eyes (E)					
Ears (Ea)					
Blowhole/s (B)					
Oral cavity					
Musculoskeletal: bone, muscle, joints, tendons					
Mammary glands & subcutaneous lymph nodes					
Pleural cavity & thoracic lymph nodes					
Heart (Ht), pericardium, great vessels					
Thyroid (Th), Parathyroid (PTh)					
Trachea (Tr)					
Lungs (Lu)					
Abdominal cavity & visceral lymph nodes					
Liver (Li) & gall bladder (GB)					
Spleen (Spl)					
Pancreas (P)					
Oesophagus (Oe)					
Stomach (St)					
Small Intestine (SI)					
Colon (Co)					
Kidneys (Ki), ureters					
Bladder (B)					
Adrenals (Adr)					
Testes (T)/Ovary (Ov)					
Reproductive tract					
Nervous system: Brain (Br), spinal cord (SC)					
Other notes					

NOTE: ***It is an offence under the Biodiversity Conservation Act 2016 to take native fauna, living or dead, without an appropriate licence. This includes necropsy sampling. Contact wildlifelicensing@dbca.wa.gov.au or the Wildlife Coordinator for further information.***

SPILL NAME: ______________________________

F5-2e WILDLIFE INTAKE – NECROPSY FORM – OTHER REPTILES

IDENTIFICATION

Animal ID # ____________________ **Other ID** ______________________

Species ________________________________ **Age** ☐ adult ☐ subad ☐ juv **Sex** □ M □ F □ undetermined

(circle) Found dead /euthanased/ died **Date of death** (dd/mm/yy) _____________________ □ actual □ est.

Frozen/thawed □ Yes □ No **Condition of carcass** □fresh; □ decomposed (circle): mild/moderate/advanced

Date necropsied ____________________ **Examiner/affiliation** _________________________________

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

Carcass disposition (tick & add details/location) □ frozen □ buried □ other ________________________

EXTERNAL EXAMINATION (* = priority information)

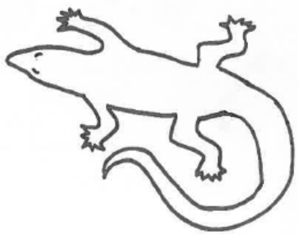
Body weight* ____________ □ actual □ est. Body condition score (*circle*): *emaciated* 1 2 3 4 5 *obese*

<u>*CODES*</u>*: Left **L**; Right **R**; Eyes **E**; Front leg **F;** Hind leg **H;** Head **Hd;** Neck **N;** Pectoral girdle **Pec**; Pelvis **Pv**; **P**; Tail **T;** Vent **V.***

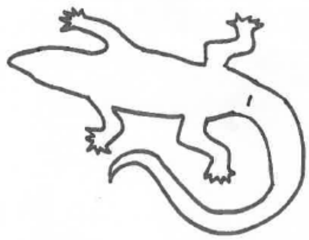
Tick if present; use diagrams and add anatomic codes, comments & corresponding photo numbers as required):

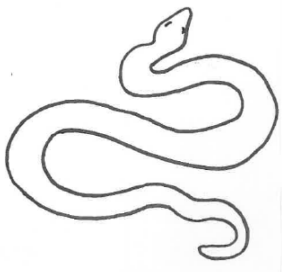
PATHOLOGY	*ANATOMIC CODE/S*	*COMMENTS*	*PATHOLOGY*	*ANATOMIC CODE/S*	*COMMENTS*
☐ Oil/tar*			☐ crushing/bruising		
☐ Wounds/fractures			☐ retained slough		
☐ Amputation/s			☐ other		

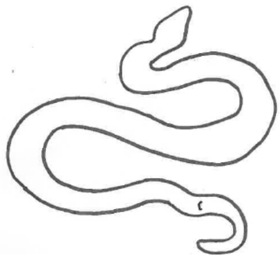
DORSAL



VENTRAL







Morphometrics (include units)	
Snout-vent length	

SAMPLE SUMMARY (<u>*See P-5ii for sampling procedures; * = **priority samples.** See over for anatomic codes*</u>*)*

□ Samples for petrochemical analysis (tick): □ external oil sample;* □ stomach contents;*□ Li *(NB only collect internal samples for analysis if animal is freshly dead (<24h). Avoid contact of samples with plastic. Tissue samples min 50g, fluid min 5ml. Seal with evidence tape and label L5-1 "oil sample evidence" then freeze/refrigerate)*

□ Photographs* (*include completed L5-3 "Photo evidence dead animal" label in first and last photo for each individual)*

□ Histopathology - (insert codes): ____

□ Frozen tissues for microbiology (insert codes): ____

□ Parasites in 70% ethanol (record anatomical location) ____

□ Other ____

<u>NOTE:</u> It is an offence under the Biodiversity Conservation Act 2016 to take native fauna, living or dead, without an appropriate licence. This includes necropsy sampling. Contact wildlifelicensing@dbca.wa.gov.au or the Wildlife Coordinator for further information.

F5-2e

INTERNAL EXAMINATION		Tick & enter on sample summary p.1			
Organ (code in brackets)	**Description (NSF= no significant findings; NE = not examined)**	**Photo**	**Tissue fixed**	**Tissue Fresh**	**Petrochem. analysis**
Eyes (E)					
Ears (Ea)					
Nares (N)					
Oral cavity					
Musculoskeletal: bone, muscle, joints, tendons					
Coelomic cavity (note presence of fluid; fat atrophy; haemorrhage; adhesions)					
Heart (Ht), pericardium, great vessels					
Trachea (Tr)					
Lungs (Lu)					
Liver (Li) & gall bladder					
Spleen (Spl)					
Pancreas (P)					
Lymph nodes (LN)					
Oesophagus (Oe)					
Stomach (St)					
Small Intestine (SI)					
Colon (Co)					
Caecum (Cae)					
Cloaca (Cl)					
Adrenals (Adr)					
Thyroid (Th), Parathyroid (PTh)					
Kidneys (Ki), ureters					
Bladder (B)					
Testes (T)/Ovary (Ov)					
Oviduct (Ovd)					
Nervous system: Brain (Br), spinal cord (SC)					
Other notes					

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Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

SPILL NAME: ______________________________

F5-2f

F5-2f WILDLIFE INTAKE – NECROPSY FORM – OTHER MAMMALS

IDENTIFICATION

Animal ID # ____________________ **Other ID** ______________________

Species ________________________________ **Age** ☐ adult ☐ subad ☐ juv **Sex** ☐ M ☐ F ☐ undetermined

(circle) Found dead /euthanased/ died **Date of death** (dd/mm/yy) ____________________ ☐ actual ☐ est.

Frozen/thawed ☐ Yes ☐ No **Condition of carcass** ☐fresh; ☐ decomposed (circle): mild/moderate/advanced

Date necropsied ____________________ **Examiner/affiliation** _________________________________

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

Carcass disposition (tick & add details/location) ☐ frozen ☐ buried ☐ incinerated ☐ other ________________________

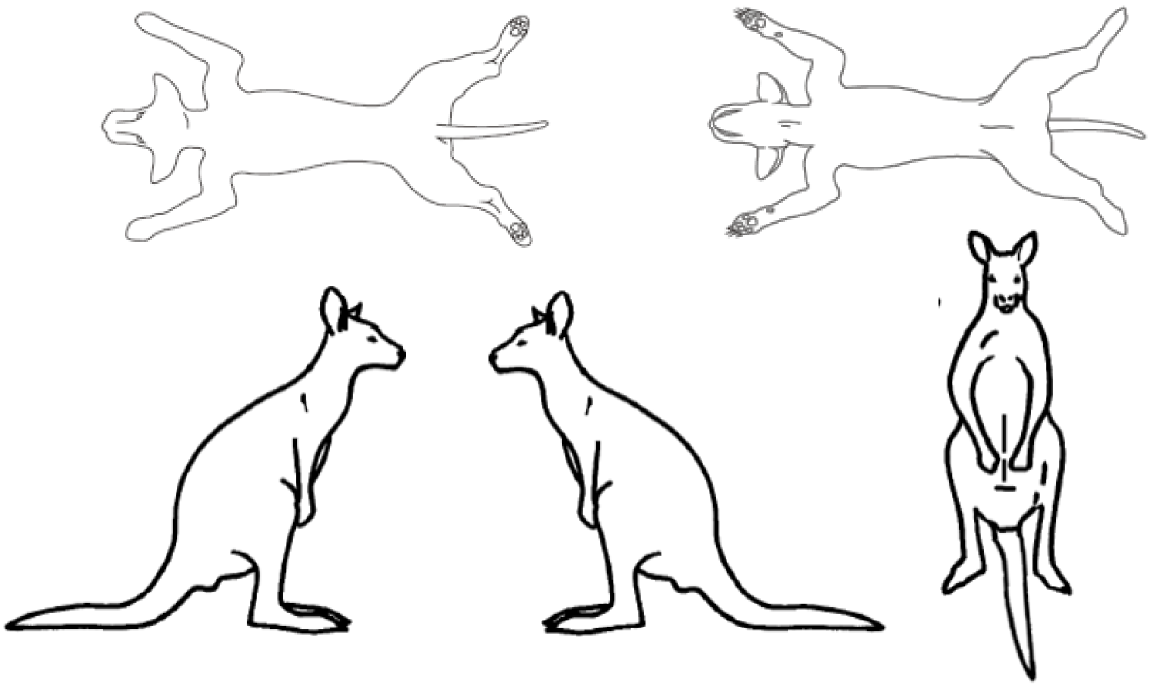
EXTERNAL EXAMINATION (* = priority information)

Body weight* ____________ kg ☐ actual ☐ est. Body condition score (*circle*): *emaciated* 1 2 3 4 5 *obese*

*CODES: Left **L**; Right **R**; Digits **D1**-5; Ears **Ea**; Eyes **E**; Foreleg **F**; Hindleg **H**; Head **Hd**; Neck **N**; Pectoral girdle **Pec**; Pelvis **Pv**; Phalanx **P1-5**; Tail **T***

Tick if present; use diagrams and add anatomic codes, comments & corresponding photo numbers as required):

PATHOLOGY	*ANATOMIC CODE/S*	*COMMENTS*	*PATHOLOGY*	*ANATOMIC CODE/S*	*COMMENTS*
☐ oil/tar*			☐ crushing/bruising		
☐ wounds/fractures			☐ skin disease		
☐ pressure injury			☐ other		



SAMPLE SUMMARY (*See P-5ii for sampling procedures; *** = priority samples.** See over for anatomic codes*)

☐ External photographs* (*include L5-3 "Photo evidence dead animal" label in first and last photo for each individual*)

☐ Samples for petrochemical analysis (tick): ☐ external oil;* ☐ bile*; ☐ urine; ☐ blood (*only collect internal samples for analysis if animal is freshly dead (<24h). Avoid contact of samples with plastic. Tissue samples min 50g, fluid min 5ml (except bile – no min volume). Seal with evidence tape and label L5-1 "oil sample evidence" then freeze/refrigerate)*

☐ Histopathology - (insert codes): ____

☐ Frozen tissues for microbiology (insert codes): ____________________________________

☐ Parasites in 70% ethanol (record anatomical location) _______________________________

☐ Other ____

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INTERNAL EXAMINATION		Tick & enter on sample summary p.1			
Organ (code in brackets)	**Description (NSF= no significant findings; NE = not examined)**	**Photo**	**Tissue fixed**	**Tissue Fresh**	**Petrochem. analysis**
Eyes (E)					
Ears (Ea)					
Nares (N)					
Oral cavity					
Musculoskeletal: bone, muscle, joints, tendons					
Mammary glands & subcutaneous lymph nodes					
Pouch					
Pleural cavity & thoracic lymph nodes					
Heart (Ht), pericardium, great vessels					
Thyroid (Th), Parathyroid (PTh)					
Trachea (Tr)					
Lungs (Lu)					
Abdominal cavity & visceral lymph nodes					
Liver (Li) & gall bladder (GB)					
Spleen (Spl)					
Pancreas (P)					
Oesophagus (Oe)					
Stomach (St)					
Small Intestine (SI)					
Colon (Co)					
Kidneys (Ki), ureters					
Bladder (B)					
Adrenals (Adr)					
Testes (T)/Ovary (Ov)					
Reproductive tract					
Nervous system: Brain (Br), spinal cord (SC)					
Other notes					

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L5-1 WILDLIFE INTAKE – OIL SAMPLE EVIDENCE

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

OIL SAMPLE EVIDENCE
Animal ID # ____________
Species:____________________
Sampling Date:___/____/___
Time: ________
Sampled by: __________________

AVERY L7160 21 per sheet

L5-2 WILDLIFE INTAKE -PHOTO EVIDENCE LIVE ANIMAL

PHOTOGRAPHIC EVIDENCE– INCLUDE COMPLETED LABEL (or equivalent information) IN THE FIRST AND LAST PHOTO OF EACH INDIVIDUAL.

SPILL NAME	
FACILITY	
DATE	
ANIMAL ID	
SPECIES	

L5-3 WILDLIFE INTAKE - PHOTO EVIDENCE – DEAD ANIMAL

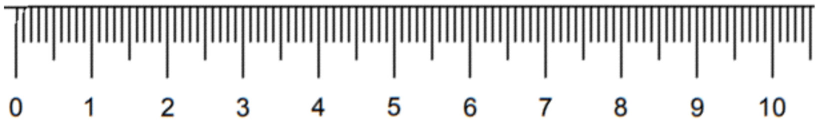
Necropsy Exam – INCLUDE LABEL IN THE FIRST AND LAST PHOTO OF EACH CASE.

Animal ID # ____

Date: ______________________ **Species:** _______________________________________

Start time: ____________________ **End time:** _________________________

Signature: _______________________________



cm/mm

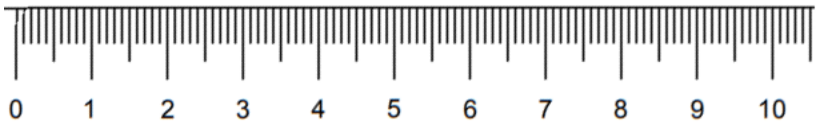
Necropsy Exam – INCLUDE LABEL IN THE FIRST AND LAST PHOTO OF EACH CASE.

Animal ID # ____

Date: ______________________ **Species:** _______________________________________

Start time: ____________________ **End time:** _________________________

Signature: _______________________________



cm/mm

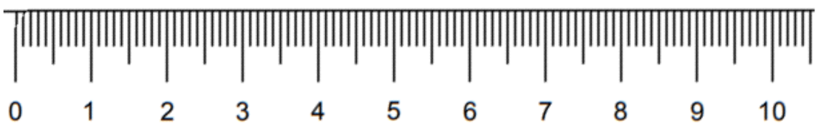
Necropsy Exam – INCLUDE LABEL IN THE FIRST AND LAST PHOTO OF EACH CASE.

Animal ID # ____

Date: ______________________ **Species:** _______________________________________

Start time: ____________________ **End time:** _________________________

Signature: _______________________________



cm/mm

Do not change image size when copying as the calibration of the ruler will be lost. Laminate copies for repeated use.

L5-4 WILDLIFE INTAKE – PROCESSING – ANIMAL TISSUE SAMPLE

ANIMAL TISSUE SAMPLE:

ID #: _______________ Species: ___________________

Death Date: ____/____/____Sampling date _____/____/____

(circle) fresh tissue / 10% formalin / 70% ethanol

Sample (circle) intact body/ dissected body/organ/other

(details): ____________________________

Sampled by (full name):_____________________________

ANIMAL TISSUE SAMPLE:

ID #: _______________ Species: ___________________

Death Date: ____/____/____Sampling date _____/____/____

(circle) fresh tissue / 10% formalin / 70% ethanol

Sample (circle) intact body/ dissected body/organ/other

(details): ____________________________

Sampled by (full name):_____________________________

ANIMAL TISSUE SAMPLE:

ID #: _______________ Species: ___________________

Death Date: ____/____/____Sampling date _____/____/____

(circle) fresh tissue / 10% formalin / 70% ethanol

Sample (circle) intact body/ dissected body/organ/other

(details): ____________________________

Sampled by (full name):_____________________________

ANIMAL TISSUE SAMPLE:

ID #: _______________ Species: ___________________

Death Date: ____/____/____Sampling date _____/____/____

(circle) fresh tissue / 10% formalin / 70% ethanol

Sample (circle) intact body/ dissected body/organ/other

(details): ____________________________

Sampled by (full name):_____________________________

ANIMAL TISSUE SAMPLE:

ID #: _______________ Species: ___________________

Death Date: ____/____/____Sampling date _____/____/____

(circle) fresh tissue / 10% formalin / 70% ethanol

Sample (circle) intact body/ dissected body/organ/other

(details): ____________________________

Sampled by (full name):_____________________________

ANIMAL TISSUE SAMPLE:

ID #: _______________ Species: ___________________

Death Date: ____/____/____Sampling date _____/____/____

(circle) fresh tissue / 10% formalin / 70% ethanol

Sample (circle) intact body/ dissected body/organ/other

(details): ____________________________

Sampled by (full name):_____________________________

ANIMAL TISSUE SAMPLE:

ID #: _______________ Species: ___________________

Death Date: ____/____/____Sampling date _____/____/____

(circle) fresh tissue / 10% formalin / 70% ethanol

Sample (circle) intact body/ dissected body/organ/other

(details): ____________________________

Sampled by (full name):_____________________________

ANIMAL TISSUE SAMPLE:

ID #: _______________ Species: ___________________

Death Date: ____/____/____Sampling date _____/____/____

(circle) fresh tissue / 10% formalin / 70% ethanol

Sample (circle) intact body/ dissected body/organ/other

(details): ____________________________

Sampled by (full name):_____________________________

ANIMAL TISSUE SAMPLE:

ID #: _______________ Species: ___________________

Death Date: ____/____/____Sampling date _____/____/____

(circle) fresh tissue / 10% formalin / 70% ethanol

Sample (circle) intact body/ dissected body/organ/other

(details): ____________________________

Sampled by (full name):_____________________________

ANIMAL TISSUE SAMPLE:

ID #: _______________ Species: ___________________

Death Date: ____/____/____Sampling date _____/____/____

(circle) fresh tissue / 10% formalin / 70% ethanol

Sample (circle) intact body/ dissected body/organ/other

(details): ____________________________

Sampled by (full name):_____________________________

AVERY L7173 10 per sheet

L5-5 WILDLIFE INTAKE – PHOTO MEMORY CARD EVIDENCE

PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________	PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________	PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________
PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________	PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________	PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________
PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________	PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________	PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________
PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________	PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________	PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________
PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________	PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________	PHOTOGRAPHIC EVIDENCE: MEMORY CARD Spill: ____________ Facility: ________ Date range: __________ to __________ Log # range: __________ to __________
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AVERY L7160 21 per sheet

F6-1 OILED WILDLIFE CLEANING ROOM RECORD

Group notes (e.g. pre-treatment):

	Band #/colour	Species	Pre-treated Y/N	Cleaning Start time	Cleaning End time	Notes (medical complications; concerns; special techniques)	Washer initials	Rinser initials	Exit band check (tick)
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

Department of Biodiversity, Conservation and Attractions

F7-1

Spill Name: ________________________

F7-1 OILED WILDLIFE REHABILITATION – DAILY PROGRESS RECORD

Band #/colour:	Species:

GAVAGE & MEDICATIONS (refer to Live Animal Assessment form for medication prescriptions):

Date	Gavage Type/s* (circle)	Vol (ml)	Frequency/day (cross off when done)	Meds given (cross off when done)	Notes	Init.
	W HS E F		1 2 3 4 5 6	AM M/D PM		
	W HS E F		1 2 3 4 5 6	AM M/D PM		
	W HS E F		1 2 3 4 5 6	AM M/D PM		
	W HS E F		1 2 3 4 5 6	AM M/D PM		
	W HS E F		1 2 3 4 5 6	AM M/D PM		

* W=water; HS=Hartmann's solution; E = electrolytes; F= formula or other nutritional slurry; M/D = midday

Date	Weight □g □kg	PCV %	TS g/L	Notes	Init.

Species ______________________

Band #/colour ______________________

Department of Biodiversity, Conservation and Attractions
GOVERNMENT OF WESTERN AUSTRALIA

Spill Name: ___________________________

F7-2 OILED WILDLIFE REHABILITATION – POOL OBSERVATION RECORD

Date:			Pool ID:												
			Behaviour observed* (tick those which apply and add details in Notes)												
	Species	Band #/colour or identifying characteristic	Abn LU	XS HO	OMB	Dep	WDr	Abn P	Agg	Div	Fly	S-Fd	Other	Notes	Entered on individual record? (tick)
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															

***KEY:** **Abn LU** = abnormal limb use; **XS HO** = excessive hauling out; **OMB** = open mouth breathing; **Dep** = depression/lethargy; **Abn P** = abnormal posture; **Agg** = aggression; **Div** = diving; **Fly =** flying; **S-Fd** = self-feeding.

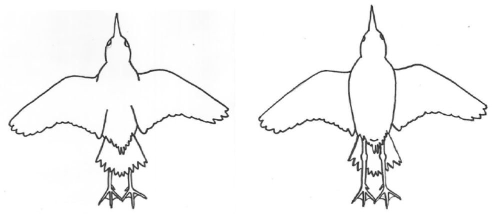
F7-3 OILED WILDLIFE REHABILITATION – WATERPROOFING RECORD

Band #/colour:	Species:

DATE: __________________ Swim time: ____________

Haulout access? (circle) YES NO

ASSESSMENT (refer to key; label each region assessed)



Dorsal Ventral

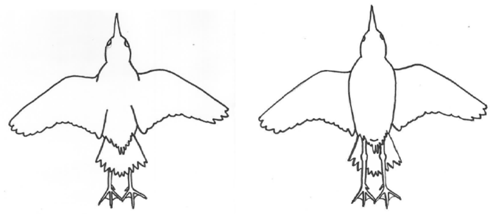
Overall Waterproofing Grade: ☐

Comments:

DATE: __________________ Swim time: ____________

Haulout access? (circle) YES NO

ASSESSMENT (refer to key; label each region assessed)



Dorsal Ventral

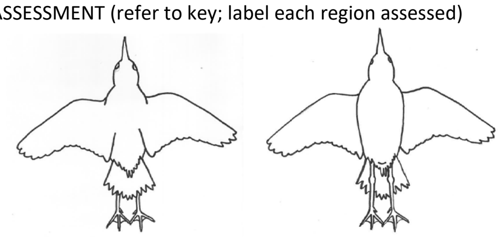
Overall Waterproofing Grade: ☐

Comments:

DATE: __________________ Swim time: ____________

Haulout access? (circle) YES NO

ASSESSMENT (refer to key; label each region assessed)



Dorsal Ventral

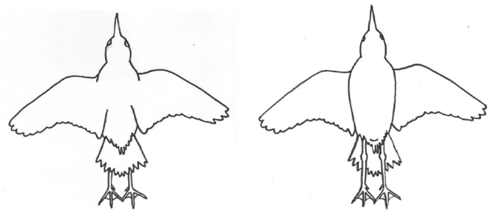
Overall Waterproofing Grade: ☐

Comments:

DATE: __________________ Swim time: ____________

Haulout access? (circle) YES NO

ASSESSMENT (refer to key; label each region assessed)



Dorsal Ventral

Overall Waterproofing Grade: ☐

Comments:

WATERPROOFING GRADING KEY (after Wildbase 2018)

Waterproofing assessment		
1	Waterproof	Feathers soft and dry, down feathers fluffy, unable to see skin when peeling feathers back
2	Surface Wet (SW)	Tips of coverts wet, coverts dry except for exposed edge, down feathers dry, cannot see skin when peeling feathers back
3	Heavy Surface Wet (HSW)	Coverts wet along length to down, down feathers dry/fluffy, cannot see skin when peeling feathers back
4	Deep Surface Wet (DSW)	Coverts wet along length to down, down wet but some pluming, can see skin when peeling feathers back
5	Wet to skin (WTS)	Coverts wet and stiff, down feathers matted or not visible, can easily see skin when peeling feathers back
6	Rewash	Persistent WTS areas over body that do not improve over several days/week, with cause believed to be oiling (petroleum or fish/food contamination

Overall waterproofing grade	
A	Predominantly WP, might have small areas WTS/DSW that are unlikely to impact behaviour/thermoregulation in aviaries, even in inclement/cold weather.
B	WTS or DSW large areas that may impact behaviour or thermoregulation if housed outdoors overnight in inclement/cold weather. Making steady improvements.
C	WTS/DSW large areas, likely to cause discomfort, hypothermia or abnormal behaviour if housed outdoors in cold weather/rain. Consider rewash if no improvement over several days.

Department of Biodiversity, Conservation and Attractions

Spill Name: ______________________________________

F7-4

F7-4 DAILY ROUNDS & LABORATORY RECORD

AREA (TICK): ☐ INTAKE ☐ PRE-WASH CARE ☐ REHABILITATION

Record details on this sheet as the sample is taken. Please cross out record once results have been transferred to the animal's Daily Progress record (Form F7-1).

Species	Band#/colour	Weight (g)	Clay tray #	Clay slot #	Centrifuge slot #	PCV %	TS g/L	Notes

WA OWR MANUAL

SECTION 4: APPENDICES

A-1 WEIGHT CHART FOR AUSTRALIAN BIRDS (Walraven 2004)

Table 2 **WEIGHT CHART**

- *All weights in grams unless otherwise stated.*
- *All weight data from Marchant.S and Higgens. P.J., (RAOU 1990) Handbook of Australian, New Zealand and Antarctic Birds. Oxford University Press, Melbourne*
- *Range: M = Males, F = Females, C = Combined*

Selected species	Mean	Standard deviation	Range	No. birds measured
GREBES				
Great Crested Grebe			C 440 - 1219	C 7
Australasian Grebe	218.6	25.01	C 166 - 281	C 36
Hoary-headed Grebe	M 257.9 F 223.1	M 30.2 F 27.6	M 202 - 311 F 190 - 276	M 14 F 14
PENGUINS				
Little Penguin	M 1172 F 1048	M 164 F 159	M 550 - 2130 F 550 - 2100	M 12 278 F 10 973
Rockhopper Penguin *(in kg)*	M 2.50 F 2.44	M 0.26 F 0.16	M 2.00 - 2.95 F 2.15 - 2.70	M 14 F 15
TUBE-NOSED BIRDS				
Wandering Albatross	M 9.768 F 7.686	M 0.875 F 0.559	M 8.193 - 11.907 F 6.719 - 8.703	M 20 F 22
Royal Albatross *(in kg)*	M 8.9 F 7.6	M 0.4 F 0.8	M 8.2 - 9.5 F 6.6 - 9.1	M 5 F 5
Black-browed Albatross	M 3710 F 3170	M 0.45 F 0.26	M 3300 - 4700 F 2800 - 3800	M 11 F 10
Shy Albatross *(in kg)*	M 4.35 F 3.70		M 3.9 - 5.1 F 3.2 - 4.4	M 18 F 18
Grey-headed Albatross *(in kg)*	M 3.38 F 2.98		M 3.1 - 3.7 F 2.8 - 3.2	M 13 F 10
Yellow-nosed Albatross	C 2199	C 227.9	C 1780 - 2840	C 26
Sooty Albatross	C 2500	C 200	C 2100 - 3400	C 176
Southern Giant Petrel *(in kg)*	M 5.14 F 4.22	M 0.42 F 0.44	M 4.3 - 5.6 F 3.3 - 5.15	M 20 F 21

Selected species	Mean	Standard deviation	Range	No. birds measured
Northern Giant Petrel	M 4790 F 3580	M 330 F 300	M 4100 - 5450 F 3100 - 4450	M 57 F 49
Cape Petrel	M 442 F 407		M 380 - 550 F 360 - 510	M 23 F 22
Gould's Petrel	C 186	C 9.5	C 170 - 220	C 20
Kermadee Petrel	C 509	C 70.6	C 370 - 590	C 7
Soft-plumaged Petrel	C 312	C 34.7	C 250 - 380	C 85
Fairy Prion	M 141.4 F 136.8	M 15.67 F 14.77	M 117 - 178 F 108 - 171	M 31 F 26
Short-tailed Shearwater	M 520 F 564	M 30 F 35	M 460 - 610 F 480 - 640	M 50 F 50
Flesh-footed Shearwater	C 609	C 52.7	C 533 - 692	C 9
Fluttering Shearwater	M 221.2 F 236.9	M 21.75 F 31.94	M 199.5 - 243 F 206 - 302.2	M 2 F 2
Hutton's Shearwater	C 226	C 26.8	C 165 - 259	C 12
Wedge-tailed Shearwater	C 388.0		C 300 - 500	C 770
PELICANS AND ALLIES				
Australian Pelican *(in kg)*			C 4 - 6.8	
Australasian Gannet	C 2258		C 2000 - 2600	C 19
Red-footed Booby			M 928 F 928 - 1068	M 1 F 3
Brown Booby	M 962.0 F 1260.0		M 850 - 1190 F 970 - 1480	M 20 F 29
Masked Booby	M 1677 F 1852		M 1510 - 1930 F 1520 - 2270	M 39 F 32
Abbott's Booby	M 1410.4 F 1467.6		M 1300 - 1620 F 1248 - 1724	M 8 F17
Darter	M 1600 F 1700	M 300	M 1200 - 2100 F 900 - 2600	M 16 F 18
Little Pied Cormorant	M 800 F 700	M 100 F 100	M 700 -900 F 400 - 900	M 17 F 30
Black-faced Cormorant				

Table 2 (page 2) **WEIGHT CHART**

Selected species	Mean	Standard deviation	Range	No. birds measured
Pied Cormorant *(in kg)*	M 1.8 F 1.6	M 0.3 F 0.2	M 1.5 - 2.2 F 1.0 - 1.9	M 5 F 3
Black Cormorant	M 2400 F 2000	M 300 F 200	M 1600 - 3100 F 1200 - 3000	M 79 F 228
Little Black Cormorant	M 1100 F 900	M 100 F 100	M 800 - 1300 F 700 - 1300	M 42 F 34
Greater Frigatebird	M 1400 F 1550			
Lesser Frigatebird	C 942.2	C 116.66	C 780 - 1170	C 4
Red-tailed Tropic Bird	C 832.6	C 116.21	C 590 - 1095	C 19
White-tailed Tropic Bird	M 295		M 220 - 345 F 220	M 3 F 1
HERONS AND ALLIES				
White-necked Heron	C 881	C 170.1	C 600 - 1220	C 9
White-faced heron	M 599.2 F 521.2	M 54.77 F 37.09	M 505 - 693 F 462 - 559	M 7 F 4
Pied Heron	C 259	C 60.6	C 210 - 372	C 6
Large Egret	M 969.2 F761.3	M473.14 F 111.92	M 353 - 1970 F 605 - 861	M 7 F 3
Little Egret			C 310	C 1
Plumed Egret			M 401.4	M 1
Reef Heron			F 332	F 1
Mangrove Heron				
Little Bittern	C 83.9	C 16.9	C 59 - 120	C 15
Black Bittern			C 317.2 - 428	C 2
Australian Brown Bittern	M 1353 F 867.7	M 307.9 F 220.8	M 875 - 2085 F 571 - 1135	M 15 F 10
Jabiru			Juvenile 4000	Juvenile 1
Glossy Ibis			F 485 - 570	F 3
White Ibis	M 2005.9 F 1605.9	M138.19 F 145.65	M 1700 - 2350 F 1300 - 2120	M 72 F 84

Selected species	Mean	Standard deviation	Range	No. birds measured
Straw-necked Ibis	M 1465 F1237.5	M 74.94 F 73.61	M 1400 - 1570 F 1150 - 1320	M 3 F 4
Royal Spoonbill	M 1886 F 1575	M 158 F 171	M 1650 - 2070 F 1400 - 1800	M 6 F 4
Yellow-billed Spoonbill			M 1814 - 1928 F 1814	M 2 F1
DUCKS, GEESE, SWANS				
Pied Goose	M 2766 F 2071	M 283 F 237	M 1838 - 3195 F 1405 - 2770	M 402 F 359
Water Whistling Duck	M 866 F 732		M 741 - 948 F 453 - 976	M 287 F 293
Grass Whistling Duck	M 766 F 720.5			M 78 F 72
Black Swan	M 6270 F 5100		M 4600 - 8750 F 3700 - 7200	M 247 F 219
Freckled Duck	M 969 F 842		M 747 - 1130 F 691 - 985	M 63 F 31
Cape Barren Goose *(kg)*			M 3.7 - 5.1	M 14
Mountain Duck				
Burdekin Duck	M 934 F 839		M 750 - 1101 F 600 - 1130	M 46 F 49
Grey Teal	M 507 F 474		M 395 - 670 F 350 - 602	M 210 F 138
Chestnut Teal	M 683 F 593	M 63.2 F 146	M 562 - 816 F 505 - 766	M 67 F 50
Australian Shoveller	M 667 F 665		M 570 - 852 F 545 - 745	M 76 F 70
Pink-eared Duck	M 404 F 344		M 290 - 480 F 272 - 423	M 77 F 81
White-eyed Duck	M 902 F 838		M 525 - 1100 F 530 - 1060	M 105 F 88
Wood Duck	M 815		M 700 - 955	M 45

Table 2 (page 3) **WEIGHT CHART**

Selected species	Mean	Standard deviation	Range	No. birds measured
Green Pygmy Goose	M 403 F 380		M 311 - 495 F 255 - 439	M 52 F 37
White Pygmy Goose				
Blue-billed Duck			C 624 - 1167	C 94
Musk Duck	M 2398 F 1551		M 1811 - 3120 F 993 - 1844	M 243 F 292
BIRDS OF PREY				
Osprey			M 990 - 1080 F 1200 - 1910	M 2 F 4
Brahminy Kite	M 536	M 47.75	M 496 - 610 F 580 - 673	M 6 F 2
White-breasted Sea Eagle	M 2400 F 3330	M 220 F 290	M 2120 - 2900 F 3000 - 3900	M 10 F 12
RAILS AND CRAKES				
Buff-banded Rail	M 181 F 165.6	M 25.1 F 36.5	M 144 - 234 F 123 - 240	M 16 F 8
Lewin's Rail	M 80.8 F 75.4	M 9.31 F 21	M 71 - 100 F 63 - 111	M 9 F 8
Spotted Crake	M 65.6 F 57.3	M 6.86 F 5.19	M 50 - 75 F 50 - 61	M 10 F 3
Red-necked Crake	C 143			C 11
White-browed Crake	C 52.1	C 6.83	C 43 - 62.5	C 11
Marsh Crake				
Black-tailed Native Hen	M 410 F 364	M 82.8 F 33.9	M 250 - 530 F 322 - 405	M 8 F 5
Dusky Moorhen	M 570 F 493	M 73.6 F 121	M 490 - 720 F 336 - 684	M 5 F 7
Purple Swamp Hen	M1091.2 F 885.4	M 94.9 F 98.5	M 785 - 1310 F 679 - 1252	M 148 F 97
Tasmanian Native Hen	M 1334 F 1251			M 152 F 120

Selected species	Mean	Standard deviation	Range	No. birds measured
Eurasian Coot	M 568 F 522	M 74.6 F 51.8	M 481 - 660 F 476 - 609	M 6 F 5
CRANES				
Brolga	M 6838 F 5663	M 649 F 560	M 4761 - 8729 F 3628 - 7255	M 321 F 217
Sarus Crane *(in kg)*			M 6.5 - 6.9 F 5.0 - 5.5	M 3 F 4
WADERS				
Comb-crested Jacana	M 84.1 F 132.8	M 9.42 F 12.3	M 70 - 90 F 120 - 146	M 4 F 10
Painted Snipe	M 123.2 F 131.5	M 15.2 F 9.89	M 106 - 142 F 119 - 145	M 5 F 6
Beach Thick-knee	M 1032	M 85.2	M 870 - 1130 F 980 - 1020	M 8 F 3
Pied Oystercatcher	M 602.3 F 626.3	M 86.9 F 91.9	M 485 - 675 F 500 - 782	M 6 F 9
Sooty Oystercatcher	M 740.3 F 778.5	M 75.07 F 88.54	M 600 - 825 F 640 - 950	M 9 F 10
Banded Lapwing			M 175 - 200	M 2
Masked Lapwing	M 264.2 F 252.8	M 20.3 F 23.3	M 230 - 300 F 191 - 296	M 14 F 15
Pacific Golden Plover	C 129.1	C 6	C 116 - 139	C 28
Grey Plover	C 223	C 15.55	C 215 - 245	C 5
Red-kneed Dotterel	M 51.4 F 47.9	M 3.85 F 3.37	M 42 - 60 F 41 - 57	M 114 F 55
Hooded Plover	C 100.3	C 8.86	C 79 - 110	C 12
Red-capped Plover	M 37.3 F 37.6	M 2.3 F 3.8	M 33 - 48 F 32 - 50	M 254 F 209
Black-fronted Plover	C 32.3	C 3.44		C 34
Black-winged Stilt	M 177.4 F 171.4	M 11.3 F 23.4	M 164 - 199 F 143 - 266	M 8 F 9

Table 2 (page 4) **WEIGHT CHART**

Selected species	Mean	Standard deviation	Range	No. birds measured
Red-necked Avocet	M 325.9 F 322.8	M 25.07 F 20.79	M 270 - 390 F 270 - 360	M 25 F 18
Banded Stilt	M 225 F 238.4	M 23.1 F 30	M 172 - 268 F 205 - 275	M 15 F 5
Ruddy Turnstone	M 133.5 F 137.9	M10.25 F 8.73		M31 F32
Eastern Curlew			M 699.8 - 1089.3 F 796.7 - 1250	
Whimbrel			M 297 - 310 F 385 - 515	M 2 F 3
Little Curlew	C 173.1	C 15.98	C 118 - 221	C 338
Wood Sandpiper	F 63.8	F 9.74	M 46 - 55 F 49 - 79	M 3 F 7
Bar-tailed Godwit			M 266.9 - 406.6 F 327 - 503.8	
Black-tailed Godwit			C 213 - 296.6	
Great knot			C 143.4 - 191.9	
Red Knot			C 117.5 - 175.1	
Sharp-tailed Sandpiper			M 72.1 - 91.0 F 55.9 - 66.0	
Red-necked Stint	M 26.4 F 27.2	M 1.60 F 1.76	M 22.3 - 31.5 F 22.1 - 31.0	M 70 F 56
Curlew Sandpiper			M 53.6 - 85.3 F 55.9 - 89.0	
Oriental Pratincole	C 76.8	C 7.39	C 61 - 94	C 66
GULLS				
Silver Gull	M 313 F 264	M 51.9 F 34.1	M 220 - 397 F 195 - 320	M 15 F 14
Pacific Gull	M 1550 F 1077	M 300 F 219	M 1200 - 1800 F 910 - 1400	M 5 F 4
Kelp Gull	M 1050 F 832		M 950 - 1130 F 540 - 970	M 13 F 15

Selected species	Mean	Standard deviation	Range	No. birds measured
TERNS				
Caspian Tern	M 566.3 F 587.5	M 177.28 F 144.46	M 356 - 775 F 405 - 765	M 4 F 6
Whiskered Tern	M 90.0 F 77.8	M 7.32 F 10.67	M 80 - 110 F 60 - 96	M 17 F 14
Gull-billed tern			M 262 - 345 F 184	M 3 F 1
Bridled tern	C 149.8	C 24.8	C 128 - 177	C 5
White-fronted Tern	M 125.8 F 131.9	M 14.4 F 22.5	M 108 - 155 F 103 - 160	M 9 F 8
Common Tern			C 105.0 - 125.5	
Roseate Tern	C 95.7	C 13.11	C 75 - 120	C 30
Black-naped Tern	M 106.5 F 106	M 5.18 F 8.85	M 97 - 112 F 98 - 120	M 10 F 7
Sooty tern	M 155.6 F 157.9	M 33.66 F 43.51	M 107 - 217 F 117 - 200	M 13 F 6
Crested Tern	M 305.7 F 241.7	M 67.41 F 47.03	M 215 - 365 F 190 - 290	M 6 F 4
Little Tern	M 51.2 F 51.9	M 9.25 F 7.61	M 35 - 60 F 39 - 60	M 8 F 6
Fairy Tern	M 72.2 F 72.4	M 5.16 F 5.52	M 68 - 80 F 64 - 80	M 6 F 11
Lesser Crested Tern			C 208.7 - 243 4	
Lesser Noddy	C 112.36	C 8.89		C 199
Common Noddy	M 196.4	M 23.99	M 172 - 225 F 164 - 188	M 5 F 3
Black Noddy			M 93 - 95 F 90 - 104	M 2 F 4

Note: *Weight of migratory birds vary greatly depending on time of year. This should be taken into consideration when assessing release weights.*

Note: *The text from which these weights are taken provide a number of weights taken at different locations for some species. Where possible, either the largest sample size or the most appropriate sampling location was selected.*

A-2 MORPHOMETRICS OF AUSTRALIAN PINNIPEDS (Barnes et al 2009)

Species	Source	Male length (m)	Female length (m)	Male weight (kg)	Female weight (kg)
Australian fur-seal	Warneke & Shaughnessy (1985)	2.16(2.01−2.27, n = 25)	1.57(1.36−1.71, n = 122)	279 (218−360, n = 13, territorial bulls)	76 (41−113, n = 122)
Australian sea-lion	Walker & Ling (1980)		1.48 ± 0.13(1.32−1.81, n = 28)		73.9 ± 7.09 (63.0−81.6, n = 14, lactating)
	Gales & Costa (1997)			Up to 300	Up to 120
	Bonner (1994)	2.0−2.5	1.7−1.8	400	80−105
New Zealand fur-seal	Crawley & Warneke (1979)	1.45−2.50	1.25−1.50	120−185	40−70
	Croxall & Gentry (1987)			120−155	40−50
	Troy et al. (1997)	1.50−1.79 (n = 22)		78−160 (n = 22)	
Subantarctic fur-seal	Condy (1978)			Up to 140	Up to 50
	Shaughnessy & Ross (1980)	1.29−1.64 (n = 7)			
	Bester (1987)			131.3 ± 20.0 (97.0−158, n = 8)	35.6 ± 4.5 (28.0−46.0, n = 29)
	Croxall & Gentry (1987)			70−160	24−45
	Kerley (1987)			88.3 ± 15.7 (n = 18, max. 118)	34.1 ± 8.2 (n = 4)
	Bonner (1994)	1.80	1.45		
Antarctic fur-seal	Payne (1979)			130 (>9 yr)	31.2 (5 yr)−38.2 (>11 yr)
	Bonner (1982)	1.84 ± 0.08 (1.72−1.97, n = 15)	1.28 ± 0.08 (1.13−1.39, n = 21)	140 ± 14.2 (126−160, n = 4)	38.2 ± 5.9 (30−51, n = 17)
	Croxall & Gentry (1987)			110−200	22−50
	Bonner (1994)	1.65−2.0	1.15−1.40		
Leopard seal	Hamilton (1939)	2.21−3.05 (n = 18); 2.89 (>4 yr)	2.21−3.58 (n = 20); 3.29 (>4 yr)		
	Laws (1993)			Up to 600 kg (males + females)	
	Gray (2005)	2.94 ± 0.19 (2.76−3.50, n = 14)	3.07 ± 0.20 (2.80−3.42, n = 22)		
Southern elephant seal	Jones (1981)	4.88 ± 1.84 (breeding, n = 11)		2176 (breeding, n = 11)	
		4.73 ± 2.89 (bachelor, n = 19)		1973 (bachelor, n = 19)	
	Laws (1993)	4.2−4.5	2.6−2.8	3000−4000	400−900
	Woods et al. (1995a)		2.50 (2.10−2.90, n = 96)		369 (215−610, n = 96)

A-3 STANDARD PREVENTATIVE CARE FOR SELECTED BIRD TAXA

(after Fiorello et al 2014 and Wildbase 2017)

This table was adapted to WA species with input from WA bird rehabilitation experts. It is intended ***as a guide only****. Decisions on preventative care should be made by attending rehabilitators and veterinary staff with local species knowledge.*

+/- = case specific; See A-4, P-7 and P-8 of this Manual for further guidance on salt supplementation.

Common name/s	Family/Taxon	Genera	Itraconazole	Salt	Keel cushion	Booties	Hock wrap
Albatrosses	Diomedeidae	Albatross - unspecified	Y	Y	±	N	N
Avocets, Stilts, Sandpipers, Godwits & Phalaropes	Recurvirostridae	*Himantopus*	N	N	N	N	N
		Recurvirostra	N	N	N	±	N
		Arenaria; Calidris; Limosa; Lymnodromus; Numenius; Phalaropus; Tringa	N	±*	N	N	N
Boobies & Gannets	Sulidae	*Sula; Papasula; Morus*	Y	Y	Y if not standing	N	N
Cormorants & Shags	Phalacrocoracidae	*Phalacrocorax*	Y	N	N	±	N
Darters	Anhingidae	*Anhinga*	N	N	N	N	N
Ducks, Geese & Waterfowl	Anatidae	*Anas*	N	N	N	N	N
		Aythya	±	N	±	±	±
		Oxyura	±	N	±	±	±
		Spatula	N	N	±	Y	±
		Ducks - unspecified	±	N	±	±	±
		Geese - unspecified	N	N	N	N	N
Frigatebirds	Fregatidae	*Fregata*	Y	Y	±	±	±
Grebes	Podicipedidae	Grebe - unspecified	±	N	±	Y	±
Gulls, Terns & Skimmers	Laridae	Gulls - unspecified; Terns - unspecified	±	N	N	N	N
Herons, Egrets & Bitterns	Ardeidae	Herons - unspecified; Egrets - unspecified	N	N	±	N	N
Ibis and Spoonbills	Threskiomithidae	*Plegadis; Threskiornis; Platalea*	N	N	Y if not standing	N	N
Jacanas	Jacanidae	*Irediparra*	N	N	N	N	N
Kingfishers	Alcedinidae	*Megaceryle*	N	N	N	N	N
Northern & Southern Storm-petrels	Hydrobatidae or Oceanitidae	Storm petrel - unspecified	Y	Y	N	±	±
Ocean Raptors (Osprey, Sea Eagle, Kites, Harriers)	Falconiformes	*Pandion; Elanus; Aquila, Circus, Milvus; Haliastur; Haliaeetus; Hieraaetus; Lophoictinia*	Y	N	±	±	N
Oystercatchers	Haemantopodidae	*Haemantopus*	N	N	N	N	N
Pelicans	Pelecanidae	*Pelecanus* - unspecified	±	N	Y if not standing	N	N
Penguin (Little)	Spheniscidae	*Eudyptula*	Y	Y	N	±	±
Plovers & Lapwings	Charardriidae	*Charadrius*; Plovers - unspecified	N	N	N	N	N
Rails, Gallinules & Coots	Rallidae	*Fulica; Porzana*; Rails-unspecified	N	N	N	N	N
Shearwaters & Petrels	Procellariidae	*Fulmarus*	Y	Y	Y	Y	±
		Pterodroma	Y	Y	±	±	N
		Shearwater - unspecified	Y	Y	±	Y	±
Skuas & Jaegers	Stercorariidae	Jaegar - unspecified	Y	Y	N	N	N
Storks**	Ciconiidae	*Ephippiorhynchus*	N	N	N	N	N
Tropicbirds	Phaethontiformes	*Phaethon*	±	N	N	N	N

* Sandpiper species which inhabit hypersaline lakes may benefit from salt supplementation.

A-4 FORMULARY FOR OILED WILDLIFE RESPONSE

This formulary includes medications which are most likely to be used in OWR. It is not an exhaustive list and the reader is referred to standard avian, reptile and wild animal formulary texts for omitted medications and dose rates. All S4 and S8 drugs (e.g. antibiotics, antifungals, analgesics and anti-inflammatories, sedatives) must be prescribed by a veterinarian. All medications should be administered under veterinary direction.

Veterinarians please note: with the exception of itraconazole as a preventative treatment for selected bird species, S4 and S8 medications are not routinely administered to oiled animals during a large response. The principles of veterinary care in oiled wildlife response emphasise the management of group health rather than treatment of sick individuals, and any individual medical regime must balance the therapeutic benefit to an individual case against the potential impacts of treatment on the overall wildlife response effort.

Formulary References

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FORMULARY - BIRDS		
DRUG	**DOSE, FREQUENCY AND ROUTE***	**COMMENTS***
Amoxicillin + clavulanic acid	125mg/kg po bid (13)	Antibiotic. All species. Note high dose rate and large volumes required for birds.
Enrofloxacin	6–30 mg/kg sid; 10–15 mg/kg bid (1); 10-15mg/kg po bid; 20-25mg/kg sid (13)	Antibiotic. Dilute with WFI before injection, or switch to oral dosing if possible, as injectable solution is alkaline and causes muscle necrosis.
Itraconazole	dose range 5-20mg/kg po sid: 5mg/kg po sid (5); 15mg/kg po sid (15); 20mg/kg po sid (6,13)	Antifungal. High end of range used in some OWR protocols (6, 13, 12), low end in others (5). Has been used at 10mg/kg daily for >30 days safely (1). Dose according to risk of aspergillosis and knowledge of the species (see also A-3).
Meloxicam	0.3-0.4mg/kg po sid (1)	All species - anti-inflammatory and analgesic
Salt tablets	100mg/kg po sid; commence at 1/4 of maximum dose rate and increase to full dose over 4 days if no adverse effects seen (5)	Salt supplementation required for true pelagic species (Procellariformes) kept in fresh water for >10 days. Toxicity (tremors, lethargy, convulsions) can be seen with overdosing. See A-3, P-7 and P-8 of this Manual for details.
Vetafarm® Seabird tablets	1 tablet per kg body weight of bird sid	Multivitamin to overcome vitamin deficiencies associated with frozen fish diets (including thiamine deficiency) for all piscivores
Vitamin B complex	10-30mg po/sc sid (13)	Supplementation may act as an appetite stimulant
Vitamin E	100IU per kg of fish po sid (9)	Required supplement for all piscivores consuming frozen fish; add to fish before feeding

FORMULARY - REPTILES	WARNING: Ivermectin is toxic to chelonians and crocodilians (2)	
DRUG	**DOSE, FREQUENCY AND ROUTE***	**COMMENTS***
Amoxicillin	10mg/kg im sid, 22mg/kg po sid/bid (3)	Antibiotic.
Ceftazidime	20mg/kg im q72h (2,3)	Antibiotic. Following reconstitution, solution is stable for 7 days if refrigerated or 3 months if frozen. Do not refreeze thawed solution.
Cod liver oil/mayonnaise	2-3 parts mayonnaise: 1 part cod liver oil 5ml/kg BWt q24-48h (12)	Gastric protectant. Use as a gavage for turtles suspected of having ingested oil.
Enrofloxacin	most species 5-10mg/kg im q48h (3); sea turtles 5mg/kg im q48h (2)	Antibiotic. Dilute with WFI before injection, or switch to oral dosing, as injectable solution is alkaline and causes muscle necrosis. Excellent activity against some Gram + and most Gram - bacteria but *Pseudomonas* resistance is common.
Iron dextran	5mg/kg im once; 12mg/kg im q14d x 2 (11)	May assist with management of anemia in sea turtles
Itraconazole	5-10mg/kg po sid (3)	Antifungal. Hepatotoxicity may occur; start with low dose. Not routinely used as a preventative medication in oiled reptiles
Meloxicam	0.1-0.5mg/kg po, sc q24-48h (2); 0.2-0.4mg/kg po, sc sid (3)	Anti-inflammatory and analgesic - use these doses in most species but NB turtles (below)
	Turtles: 0.2-0.4mg/kg sc q72h (11)	Efficacy and dosing interval unproven in sea turtles; 0.1mg/kg dose does not result in therapeutic blood levels and has an unacceptably short half-life so use cautiously at higher doses (11)
Metronidazole	20mg/kg po q24-48h (3)	Antimicrobial. Anaerobic infections; motile protozoa
Praziquantel	8 mg/kg im twice at two week intervals (2)	Antiparasitic; may be beneficial for sea turtles chronically parasitised with spirorchids or flukes
Sucralfate	500-1000mg/kg po q6-8h (2)	Gastro-protectant; trade name Carafate®. Use 1g/10ml liquid for small turtles (5-10ml/kg), 1g tablets for large turtles (0.5-1 tablets/kg)
Tramadol	5mg/kg po q48h; 10mg/kg po q72h (11)	Analgesic. These doses have maintained therapeutic concentrations in Loggerhead turtles (11)
Vitamin B complex	0.3ml/kg sc, im q24h (2); 20ml/kg sc (4)	Supplementation of B group vitamins may act as an appetite stimulant in some reptiles
Vitamin B12	0.05mg/kg sc, im (3)	See above

FORMULARY - MARSUPIALS **WARNING**: antibacterials carry a risk of dysbiosis if used in herbivorous marsupials (e.g. koalas, macropods and wombats). **NOTE**: cefovecin has an unacceptably short duration of efficacy in marsupials and should not be used in this taxon (8)		
DRUG	**DOSE, FREQUENCY AND ROUTE***	**COMMENTS***
Amoxicillin	macropods: 10mg/kg im (14)	Antibacterial.
Clavulanic acid-amoxycillin	12.5mg/kg sc sid, bid; 12.5mg/kg po bid (14)	Antibacterial. See warning above re oral dosing
Diazepam	macropods 0.1-2mg/kg im or 0.1-1mg/kg iv (14)	Sedative commonly used in marsupials. Sedation duration 1-2 hours.
Enrofloxacin	5mg/kg po, sc sid (10)	Common first line antibacterial in marsupials. Repeated injections associated with skin necrosis and pain - switch to oral dosing if possible. See warning above.
Meloxicam	0.1-0.2mg/kg po, sc sid (10)	Anti-inflammatory and analgesic. Oral bioavailability negligible in koalas (10)

FORMULARY - MARINE MAMMALS **WARNING:** Anorexia and GI discomfort commonly reported with antibacterial use in marine mammals (7)		
DRUG	**DOSE, FREQUENCY AND ROUTE***	**COMMENTS***
Cefovecin	otariids: 4 mg/kg sc; dolphins 8mg/kg sc (9)	Long-acting antibacterial. Elimination half-life of a single dose in marine mammals is significantly prolonged; plasma concentrations >MIC90 for 80 days in Patagonian sea lions and 17 days in adult bottlenose dolphins (9). Use with care in renally compromised animals.
Ceftiofur	dugong 2mg/kg im sid (10)	Antibacterial. n = 1 animal in rehabilitation, given for 12 days then released
Clavulanic acid-amoxycillin	dolphins 5-10mg/kg po bid (9); pinnipeds 10-15mg/kg po bid (9)	Antibacterial. Common frontline choice for marine mammals
Diazepam	dolphins 0.1-0.15mg/kg im (9)	Sedative: mild sedation dose
Meloxicam	dolphins 0.05–0.1 mg/kg po q4-7d (9)	Anti-inflammatory and analgesic. Avoid repeated administration due to risk of gastrointestinal irritation
	pinnipeds 0.1mg/kg po, sc sid (10)	
Vitamin E	100IU per kg of fish po sid (9)	Required supplement for all piscivores consuming frozen fish; add to fish before feeding

***KEY:**

im = intramuscular; iv = intravenous; po = oral; sc = subcutaneous; sid = once daily; bid = twice daily; q??d = every ?? days; q??h = every ?? hours; WFI = water for injection; mg/kg = milligrams per kilogram body weight; MIC = minimum inhibitory concentration

A-5 DIETARY INFORMATION FOR SELECTED SPECIES

This information is adapted from academic sources as shown, in consultation with local WA rehabilitation experts. It should be used as a guide only and the reader is referred to local experts on the rehabilitation of each species for specific information.

Table A-5- 1 Diets of sea turtles - adapted from Shigenaka et al (2021), Bluvias and Eckhert (2010) and Wyneken et al (2006)

Species/status	Wild diet	Rehabilitation diet**					
		Squid	Fish S	Fish M	Fish L	Gr	Comments
Green turtle – hatchlings and juveniles <200mm length	sponges, jellyfish, algae, seagrass, small crustaceans, aquatic insects	X	X	X	X		Cut fish/squid into bite size pieces
Green turtle juveniles > 200mm length; adults	seagrass, algae	X	X			X	Subadults (<5yo) will eat meat even though herbivorous in the wild; squid is often a short term staple for rehab diets. Cut fish/squid into bite size pieces.
Loggerhead turtle	molluscs, crustaceans, algae, seagrass	X	X	X	X	X	
Olive Ridley turtle	vegetation, crustaceans, tunicates, jellyfish	X	X	X	X	X	
Hawksbill turtle	sponges, jellyfish, algae, molluscs, shrimp, fish	X	X	X	X	X	
Flatback turtle	echinoderms, crustaceans, seagrass	X	X	X	X	X	

Note: A captive diet has not been provided for leatherback turtles. Leatherbacks should not be brought into care except under the specific advice and care of rehabilitators with experience in managing this species and only with the availability of appropriate specialised facilities (Bluvias and Eckhert 2010).

****KEY**: **Fish S =** small fish e.g. whitebait; **Fish M** = medium size fish e.g. pilchards; **Fish L** = large fish e.g. herring; **MM =** meat mix (mince with added calcium and vitamins); **Inv** = commercial invertebrates e.g. mealworms, fly pupae, bloodworms, brine shrimp; **Gr =** dark leafy greens e.g. Romaine and cos lettuce; **DOC =** day old chicks; **IM =** commercial avian insectivore mix e.g. Wombaroo®

Table A-5- 2 Diets of selected bird taxa - adapted from Fiorello et al (2014), Hall (2008) and Walraven (2004)

Taxon	Wild diet	Rehabilitation diet**							
		Squid	Fish S	Fish M	Fish L	MM	Inv	Gr	Other food items and Comments
Albatross, Wandering	squid	X		X					
Albatross, small species (1-5kg)	squid, fish	X	X	X					
Avocets	invertebrates, aquatic seeds, small fish		X			X	X		
Boobies	fish, squid, crustaceans	X	X	X					
Cormorants	small fish; crustaceans		X	X			X		feed larger fish chopped diagonally
Darters	small fish, frogs, snakes, insects		X	X					feed larger fish chopped diagonally
Frigatebirds	fish, squid			X	X				
Fulmar, Southern	krill, crustaceans, fish, squid	X	X	X					
Gannets	fish	X	X	X					
Grebes	fish, aquatic invertebrates		X			X	X		
Gulls	opportunistic faunivores		X	X		X	X		
Lapwings, plovers, godwits, dotterels	insects, larvae, molluscs, worms; greens & seed		X			X	X		IM
Moorhens, swamphens, coots	aquatic plants, seed, insects, molluscs					X	X	X	IM
Pelicans	fish, crustaceans			X	X				
Penguin, Little	small fish, squid	X	X						
Petrels: large species	fish, squid	X	X	X					beef or chicken for giant petrels
Petrels, small species: prions, storm-petrels	zooplankton, squid, crustaceans	X	X						
Pratincoles	flying insects						X		
Rails, Crakes	invertebrates, aquatic seeds		X			X	X		IM
Raptors: sea eagle; osprey	fish, birds, small mammals, carrion			X	X				DOC, rats, mice
Shearwaters	fish, squid, crustaceans	X	X						
Skuas, pomarines	fish, crustaceans, molluscs, carrion, eggs, birds	X	X			X			DOC; raw eggs
Snipes	invertebrates; seeds and grit						X		IM
Stilts	invertebrates, small fish		X			X	X		IM, seafood/omnivore mixes e.g. Fish Fuel Co® Turtle Food
Terns, tropicbirds, noddies	small fish, crustaceans		X	X					feed larger fish chopped diagonally
Turnstones	invertebrates, minnows, carrion, eggs		X			X	X		IM
Waders (lge): herons, egrets, spoonbills	fish, small vertebrates, crustaceans		X	X			X		IM; mice
Waders (med): curlews, oystercatchers	crustaceans, worms, invertebrates		X				X		IM; cockles
Waders (small): sandpipers, knots, phalaropes	insects, crustaceans, molluscs		X			X	X		IM
Waterfowl: geese, swans, ducks	variety of vegetation and invertebrates					X*	X*	X	poultry seed/pellets; * insectivorous species e.g. musk ducks, pink eared duck

****KEY**: **Fish S** = small fish e.g. whitebait; **Fish M** = medium size fish e.g. pilchards; **Fish L** = large fish e.g. herring; **MM** = meat mix (mince with added calcium and vitamins); **Inv** = commercial invertebrates e.g. mealworms, fly pupae, bloodworms, brine shrimp; **Gr** = dark leafy greens e.g. Romaine and cos lettuce; **DOC** = day old chicks; **IM** = commercial avian insectivore mix e.g. Wombaroo®

A-6 CLEANING AND DISINFECTION

Table A-6- 1 Disinfectant dilutions

(adapted from: AVA Guidelines for Veterinary Personal Biosecurity 2017 3rd ed; NHMRC 2019 Infectious Control guidelines; F10® and Virkon® product information guidelines)

Final concentration	Disinfectant per Litre of water	Contact time	Uses	Comments
Bleach solution				
1000ppm (0.1%)	25ml*	10 minutes	Clean environmental disinfection of hard surfaces. Do not use on instruments unless an instrument-grade version is used	*Bleach containing 4% hypochlorite yields 40000ppm so add 25ml per litre of water. This figure needs to be recalculated if the bleach product being used contains a higher percentage of bleach. Diluted bleach loses its activity within 24 hours. Rapidly inactivated by organic material; clean before disinfection.
F10SC® (54g/L benzalkonium chloride & 4g/L polyhexamethylene biguanide hydrochloride) and **F10SC-XD®** (=F10SC® plus surfactant)**. NOTE:** detergent cleaning is required before disinfection with F10SC®, which can be left to air dry. F10SC-XD® cleans and disinfects at the same time but must be rinsed off after contact time. Concentrations below are the same for both products.				
1:250	4ml	10 minutes	disinfection of hard surfaces, utensils and cage furniture	Make up 500ml spray bottles of F10SC-XD for use in animal treatment areas, laboratories and hospital areas
1:125	8ml	30 minutes	high disinfection (kills Mycobacterium, bacterial spores, parvovirus); instrument disinfection	
1:100	10ml	15 minutes	high disinfection, quick kill (e.g. necropsy areas)	Make up 500ml spray bottles of F10SC-XD for use in necropsy areas
Virkon - S® (494g/kg potassium peroxomonosulphate; 132g/kg sodium dodecylbenzene sulphonate; 15g/kg sodium chloride)				
1% (1:100)	10g	10 minutes	footbaths and footmats	if required

Table A-6- 2 Indoor cleaning and disinfection (adapted from Fiorello et al 2014)

Item	Recommended Frequency (Minimum Frequency)	Cleaning	Disinfectant options	Notes
Food dishes, syringes, tubes	after each use	scrub with warm water and detergent	bleach; F10SC 1:250	Maintain F10 SC 1:250 soaking buckets with a lid for general disinfection of feeding equipment
Countertops (food kitchen)	after each use (daily)	scrub with warm water and detergent	F10SC XD 1:250 (wipe down, do not leave to air dry)	Maintain F10SC XD 1:250 spray bottles for wipe down of countertops after cleaning
Countertops (animal care)	after each use (daily)	clean visible debris with warm water and detergent		
Floors	daily	Sweep to remove visible debris		
	(EOD*)	hose and scrub floor with detergent	spray with F10SC 1:250 and leave to air dry OR scrub with F10SC XD 1:250, leave for 10 min then rinse	
Soft-sided pens	daily (every other day)	clean visible debris with warm water and detergent	F10 XD 1:250 (wipe down, do not leave to air dry)	
Cages other than pens	between animals (daily)	scrub with warm water and detergent	F10 SC 1:250	F10 SC 1:250 spray bottles for Field Station, Intake, cleaning and rehab
Perches	between animals (daily)	scrub with warm water and detergent	F10 SC 1:250	spray bottles as above
Fabrics (towels, sheets etc)	whenever soiled (between animals)	machine wash with detergent	if infectious disease present, pre-soak in F10SC-XD 1:125 for 30 minutes before machine wash	F10 SC-XD 1:125 soaking bucket with lid for Field Station and Laundry of PCF
Surgical instruments	after each use	scrub with warm water and detergent	dip in F10 SC 1:250 and leave to air dry	soak in kidney dishes; Soaking bucket with 1:125 F10SC-XD for necropsy
Soil substrate	as required	dry pickup and rake of debris		
Footbaths, footmats	whenever soiled (twice a week)		Virkon S 1% to be used for all footbaths and foot mats	

*EOD = every other day

Table A-6- 3 Outdoor cleaning and disinfection (adapted from Fiorello et al 2014)

Item	Recommended Frequency (Minimum Frequency)	Cleaning	Disinfectant options	Notes
Haul-outs	EOD* (weekly)	scrub with warm water and detergent	spray with F10SC 1:250 and leave to air dry OR scrub with F10SC XD 1:250, leave for 10 min then rinse	Use spray packs for spraying with F10SC or buckets for scrubbing with F10SC XD
Outdoor perches	EOD* (weekly)	hose in situ or remove for high pressure wash		
Aviaries	EOD* (weekly)	pressure hose after removing as much organic matter as possible		

Table A-6- 4 Pool cleaning and disinfection (adapted from Fiorello et al 2014)

Item	Daily Maintenance	Recommended Frequency (Minimum Frequency)	Cleaning and Disinfection	Notes
Pool with sand filter	siphon, backflush pump, empty filter basket	Weekly (monthly)	Keep chlorinated. Drain, pressure wash or steam clean, refill.	replace sand in filter at least once a month
Large pool, no filter	siphon	Weekly (monthly)		
Small pool, no filter	drain, hose out	After each use (weekly)	Do not chlorinate. Drain, scrub with F10SC XD 1:250, leave for 10 minutes then rinse, refill	empty when not in use
Warm water pool	siphon, backflush pump, empty filter basket	Weekly (monthly)		turn off water heater when not in use (e.g. overnight)

*EOD = every other day

****KEY**: **Fish S =** small fish e.g. whitebait; **Fish M** = medium size fish e.g. pilchards; **Fish L** = large fish e.g. herring; **MM =** meat mix (mince with added calcium and vitamins); **Inv** = commercial invertebrates e.g. mealworms, fly pupae, bloodworms, brine shrimp; **Gr =** dark leafy greens e.g. Romaine and cos lettuce; **DOC =** day old chicks; **IM =** commercial avian insectivore mix e.g. Wombaroo®

A-7 PREVENTATIVE BANDAGING TECHNIQUES FOR BIRDS

The following bandaging techniques and instructions have been compiled by the Oiled Wildlife Care Network (UC Davis) and have been used with permission (M.Ziccardi and L.Thompson-Barbosa, 25 March 2021).

Some bird species are particularly susceptible to pressure injuries. These techniques and instructions may assist in the prevention of pressure injuries in susceptible species during rehabilitation. See P-5i of this Manual for further information and A-3 for a guide to susceptible species.

Foot wraps (booties) for birds

Foot wraps should be secured to the lower leg below the hock with self-adhesive bandage (e.g. Vetrap®). This should be done by experienced practitioners to make sure wraps are secure, but not so tight that circulation is impaired.

Instructions for sewing reusable foot wraps (OWCN 2008)

Foot wraps are applied to pelagic birds and other species with sensitive feet to help prevent or mitigate pressure lesions while being housed out of water. They can be made with many types of materials. In an attempt to be more environmentally friendly we like to use a foot wrap that can be made out of washable cotton stockinet material. These foot wraps can be washed and reused. Below are step by step instructions for making reusable feet wraps.

Materials Needed:

1 box of 2-inch wide cotton orthopedic stockinette*
Black, white, light blue and pink spools of cotton thread
Sewing machine that sews a zigzag stitch.

*Stockinette supplier: Victor Medical Company www.victormedical.com

1) Remove the stockinet from the box and wash in a washing machine and dry in a dryer to pre-shrink the material. Do not iron the material.
2) Cut out four cardboard guides (3” wide): 8” long; 6” long; 4 ½” long; 3 ½” long.
3) Roll out the dried stockinette on a table and use the guides to trace lines with a pen or soft lead pencil across the material for the lengths of the booties you are making.
4) Sew along the lines, using a zigzag stitch. Start at one end of the line, sew the length of the

line, then pivot and reverse directions and sew along the line a second time. When you reach the edge where you started, it's a good idea to do a few back stitches and a few forward stitches to secure the ends. Trim the threads.

5) After you have finished sewing, cut along the sewing lines, about 1/8" away. Do not cut the booties before you sew them, as the knit material can easily get caught in your sewing machine.

Foot Wrap Sizes

Caring for a variety of species demands a variety of foot wrap sizes. Below are guidelines of foot wrap sizes for birds.

8"	Loons
6"	Large grebes, large ducks
4 ½"	Common murres, small grebes
3 ½"	Small ducks

Recommended Thread Color for Specific Size

Correlating a specific color of thread for a specific size foot wrap is recommended for easy identification.

Black thread:	8" booties
White thread:	6"
Light blue thread:	4 ½"
Pink thread:	3 ½"

Care Instructions

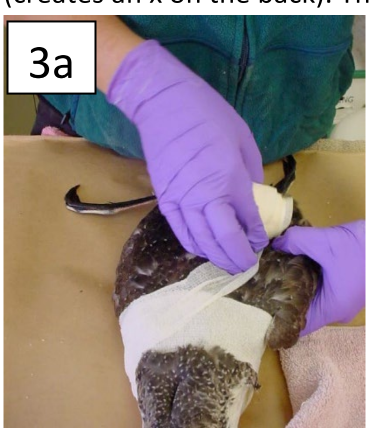
- Foot wraps made out stockinette material can be washed like normal laundry.
- It is recommended that they be washed inside a delicate laundry bag so that they don't get lost inside other laundry items.
- As your foot wraps age make sure to cut or mend any loose threads. Loose thread can cut off circulation if it becomes tangled on body parts.

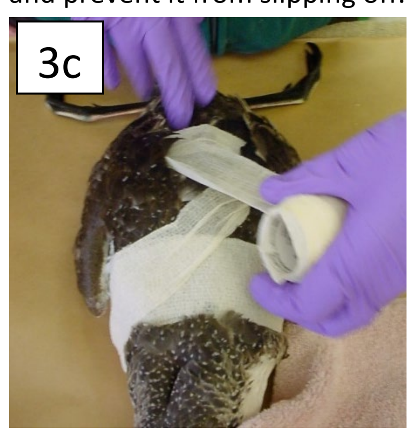
The above foot wrap sewing instructions and recommendations were shared by Jean Shirley. Jean began volunteering during the Cosco Busan oil spill in 2007. During this time she volunteered to improve the foot wraps by sewing the ends. This replaced wasteful paper tape and removed a step from the process. She was the official foot wrap sewer and has worked out the kinks in the process. We offer her many thanks for graciously agreeing to share her sewing instructions, and for all of her donated time. *J. Bill, 2008*

Keel wraps for water birds (Oiled Wildlife Care Network - used with permission.)

A “donut”, also known as a keel protector or keel wrap, reduces pressure on the thin skin over the keel when the bird is resting on that area. The goal is to prevent the keel bearing any direct weight so that pressure injuries are avoided. Some species are very susceptible to these injuries (see A-3), but they can develop in any emaciated or recumbent bird. These instructions provide a step by step guide to making and applying a keel wrap, including precautions for their use and maintenance.

Step 1. Estimate the length of the bird’s keel. Take a piece of cloth or towel that is twice that length and roll it up. Bend it into a U shape. Secure the ends of the towel with white vet-wrap or paper tape. Do not use anything that can stick to feathers. Colored vet-wrap can leach ink onto feathers when wet, and can impact waterproofing, so use white vet wrap when possible.
Step 2. Place the bird on the donut, placing the top of the keel inside of the top of the U of the donut. The donut should fit so that the end of the keel is aligned with the end of the donut.
The donut should suspend the keel off the ground.
Step 3. Attach the donut to the bird. Attach the front of the donut first by wrapping it around the apex of the U-shaped donut up around the top of the bird. Then cross it to the back of the bird and wrap it around the birds’ abdomen twice. Finish by crossing back up to the front of the bird (creates an x on the back). This will secure the donut into place and prevent it from slipping off.





Step 4.
Make sure the donut is comfortable for the bird. You should be able to easily insert two fingers behind the vet wrap at the bird’s neck. It is critical to monitor the bird closely for 30 minutes to ensure that the bird is not going to flip over with the donut.After you have applied the donut check to make sure it isn’t too tight and that the bird will be able to remain in a normal position. Check on it in the cage a couple times before leaving it on overnight.

A-8 USE OF TAB BANDS® & COLOUR BANDS FOR ANIMAL IDENTIFICATION

Colour coding

The following colour coding abbreviations are used for TAB bands® and plastic colour bands:
B Blue; O Orange; P Pink; W White; Y Yellow.

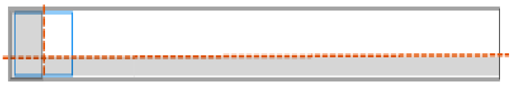
TAB® bands

Each TAB Band consists of a paper band with an adhesive tab protected by peel-off paper:

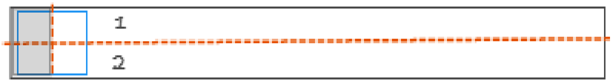
It may be necessary to cut off some of the adhesive tab as shown to make it easier to roll the band into a cylinder, especially for bird legs:

The band can be trimmed into thinner widths for birds with smaller legs:

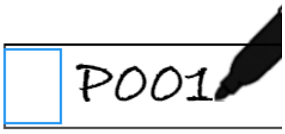
3/4 width trim:

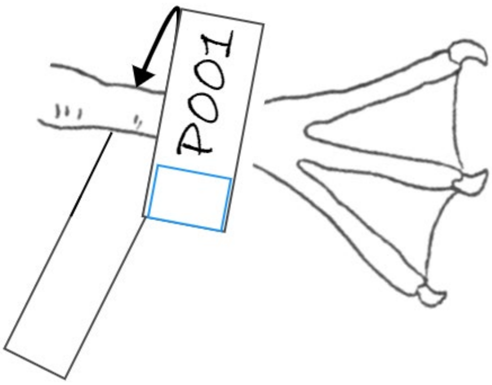


Half width trim (makes two bands):



Write animal ID # on the TAB Band next to the adhesive tab, using a permanent "Sharpie" marker. Peel off adhesive paper backing then wrap TAB® Band around the leg:





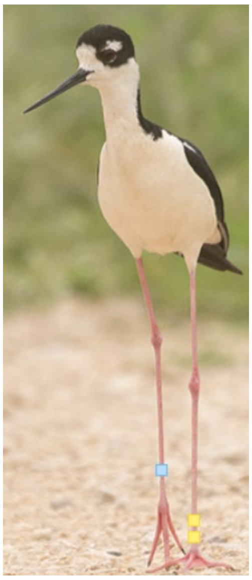
Once the band is applied, cut off the excess band.

Colour banding *(adapted from OWCN 2014)*

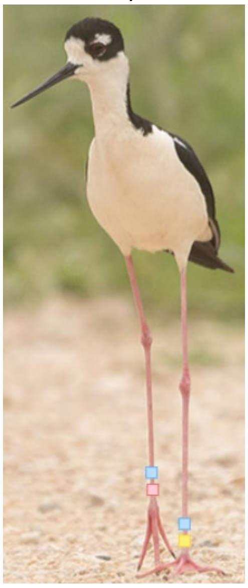
Many smaller shorebird species will be too small for TAB® Bands or numbered spiral bands to be useful. These species will be identified via a unique combination of 3-4 plastic colour bands.

Colour combinations are read LEFT LEG to RIGHT LEG (the bird's left and right, not the observer's), and from TOP (closest to bird's body) to BOTTOM (closest to foot). A forward slash mark (/) is used to indicate the break between the two legs. The colour coding abbreviations listed above are used. Examples of nomenclature are shown below:

YY/B



BY/BP



P/WB

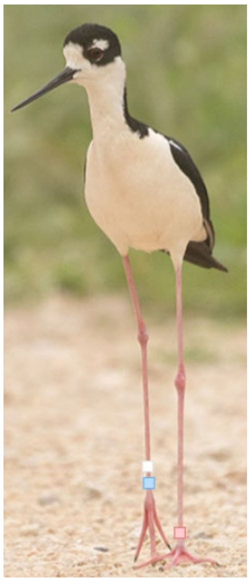


Table A-8- 1 Species guide to selection of temporary identification techniques

This table is a guide only. Monitor all bands closely for signs of excessive tightness or looseness and alter size selection as required.

		Tab Band® size			
Species	**Family/Taxon**	**Half (5/16", 7mm)**	**3/4 (12mm)**	**Full (5/8", 16mm)**	**Other marking method/s**
REPTILES Place Tab Bands® on a front flipper above the elbow joint. *CCL = curved carapace length					
Sea turtles	CCL* >20cm		X	X	mark scutes with nail polish (all turtle species)
	CCL 10-20cm	X	X		
	CCL <20cm				
Other reptiles					mark top of head with nail polish
MAMMALS Place Tab Bands® on a front flipper above the elbow joint.					
Sea lions	Adults and subadults			X	Pre-existing identifiable external characteristics or plastic flipper tags (experienced users only); clip a small amount of fur from flank or other visible spot; dye marking (e.g. hair dye or coloured livestock marker).
Fur seals	Adults and subadults			X	Pre-existing identifiable external characteristics or plastic flipper tags (experienced users only); Dye marking and clipping not advisable for fur seals.

Table A-8- 1 Species guide to selection of temporary identification techniques (cont.)

Species	Family/Taxon	Plastic Colour Band/s	Tab Band® size: Half (5/16", 7mm)	Tab Band® size: 3/4 (12mm)	Tab Band® size: Full (5/8", 16mm)
BIRDS Place Tab Band® on one leg above the ankle joint					
Accipitridae	Eagles				X
Alcedinidae	Kingfishers	X	X		
Anatidae	Blue-billed duck	X	X		
	Ducks (except Blue-billed ducks)		X	X	
	Geese (except Pygmy goose)				X
	Pygmy goose		X		
	Swans				X
Anhingidae	Darters			X	X
Ardeidae	Herons, Egrets & Bitterns		X	X	
Charardriidae	Lapwings	X	X		
	Plovers	X			
Ciconiidae	Black-necked stork				X
Diomedeidae	Albatrosses				X
Fregatidae	Frigatebirds	X	X		X
Haemantopodidae	Oystercatchers		X		
Hydrobatidae, Oceanitidae	Storm-petrels	X			X
Jacanidae	Jacanas	X	X		
Laridae	Pacific Gull, Kelp gull,Caspian Tern		X	X	
	Silver Gull, Terns (other)	X	X		
Pandionidae	Osprey			X	X
Pelecanidae	Pelicans				X
Phaethontiformes	Tropicbirds	X	X		
Phalacrocoracidae	Cormorants & Shags			X	X
Podicipedidae	Grebes		X		
Procellariidae	Giant-petrels				X
	Petrels (other), noddies, prions	X	X		
	Shearwaters			X	X
Rallidae	Rails & Coots	X	X		
Recurvirostridae	Avocets & Stilts	X	X		
Scolopacidae	Sandpipers & allies	X	X		
Spheniscidae	Little Penguin			X	
Stercorariidae	Skuas			X	X
Sulidae	Boobies and gannets			X	X
Threskiomithidae	Ibis and Spoonbills			X	X

A-9 OILED WILDLIFE RESPONSE VIDEO RESOURCES

Below are links to reference and training videos for OWR. Most of these are taken from the US Fish and Wildlife Service National Conservation Training Center's Oiled Wildlife Training Video Series. For a full list of videos available from this source, visit https://nctc.fws.gov/resources/knowledge-resources/video-gallery/inland-oil-spill.html

Phase of OWR	**Topic (duration min:sec)**	**Link**
1 Reconnaissance	Wildlife observation (08:49)	https://fws.rev.vbrick.com/#/videos/a07a71f8-bb0b-45f7-88e6-e8e4c1bae7ca
1 Reconnaissance	Field data collection (07:48)	https://fws.rev.vbrick.com/#/videos/2886bb49-465c-47e9-b145-4edca7ce108d
2 Preventative Methods	Wildlife deterrence (15:40)	https://fws.rev.vbrick.com/#/videos/5367c776-c61b-4b07-b139-b448643cad9f
2 Preventative Methods	Use of propane cannon (04:59)	https://fws.rev.vbrick.com/#/videos/60fff668-342b-4d1c-8be8-c3bac69270bd
3 Rescue	Wildlife search and capture (07:15)	https://fws.rev.vbrick.com/#/videos/5dbe9005-2c43-44c1-bf6b-92409ed3bfb6
3 Rescue	Animal capture and containment (09:44)	https://fws.rev.vbrick.com/#/videos/a3e8d9b1-d01e-4d31-ba9d-c0c865ee6a71
4 Field processing	Wildlife stabilisation in the field (14:46)	https://fws.rev.vbrick.com/#/videos/7f38f8e6-4b68-4c22-864e-51c1298e0996
4 Field processing	Packaging deceased oiled birds (12:34)	https://fws.rev.vbrick.com/#/videos/5a22e8b3-3d6d-4398-955d-21890759d710
3 Rescue 5 Intake-live 6 Cleaning	Oiled Wildlife Care Center San Francisco in action – news clip (02:16)	https://www.youtube.com/watch?v=gRHFyHUhY9o
5 Intake 6 Cleaning 7 Rehabilitation	Tour of California Oiled Wildlife Response Facility (07:45)	https://fws.rev.vbrick.com/#/videos/1b73046c-9ece-436b-ba97-0ff7ab672de3
6 Cleaning	Cleaning procedure for a pelican (03:51)	https://www.youtube.com/watch?v=w9R3XBCM1G8
8 Release	Process and release criteria (03:20)	https://fws.rev.vbrick.com/#/videos/24680369-89ea-49ba-851c-4a9030a877ed

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– Triage and First Aid V1
- Cleaning and Drying Wildlife V1
- Rehabilitation of Wildlife V1
- Release of Wildlife V1
- Scaling Down or Demobilising Response V1
- Search and Rescue V1
- Set Up and Use of Wildlife Treatment Facility V1
- Transporting Wildlife V1
- Using Wildlife Hazing Techniques – SWMS – V1
- Pre-emptive Action V1.

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DBCA Documents

The following DBCA Standard Operating Procedures, Policies and Guidelines were consulted in the development of this Manual:

- DBCA *Code of Practice for Wildlife Rehabilitation in Western Australia* March 2020.
- DBCA *Wildlife Rehabilitation Guidelines: making decisions on the fate of rehabilitated fauna*
- DBCA SOP *First Aid for Animals* Oct 2017
- DBCA SOP *Hand Capture of Wildlife* Oct 2017
- DBCA SOP *Hand Restraint of Wildlife* Oct 2017
- DBCA SOP *Animal Handling and Restraint using Soft Containment* Oct 2017
- DBCA SOP *Care of Evicted Pouch Young* Oct 2017
- DBCA SOP *Managing Disease Risk in Wildlife Management* Oct 2017
- DBCA SOP *Transport and temporary holding of wildlife* Oct 2017
- DBCA SOP SC21-01 *Euthanasia of animals under field conditions* (in draft)
- DBCA SOP SC21-02 *Use of captive bolt devices for euthanasia of fauna* (in draft)
- DBCA SOP 15.5 *Euthanasia of small stranded cetaceans using firearms*
- DBCA Corporate Policy Statement 20 *Departmental use of firearms*
- DBCA Corporate Guideline No. 42 *Departmental Use of Firearms 2020* and associated SOPs (located on the Corporate Firearms page of the RFMS Intranet)
- DBCA SOP 8.1 *Vouchering vertebrate fauna specimens* Apr 2013
- DBCA SOP *Tissue Sample Collection and Storage for Mammals* Oct 2017