

Procedure - Oil/Chemical Spill Wildlife Response - Set up and Use of Wildlife Treatment Facilities

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Prepared by	NSW DPI Emergency Management Unit NSW NPWS Reserve & Wildlife Conservation Branch		
Contact Officer	Deputy AASFAC		

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1. Application / Scope

In the event of a maritime oil or chemical spill which impacts on wildlife, treatment facilities will be required for the first-aid, cleaning and rehabilitation of affected animals. The size and location of the spill and the numbers and species of wildlife affected will determine the size and type of facilities needed. Early in a spill incident it may be difficult to determine how many animals have been affected so it is important that facilities have the capacity to be scaled up quickly if necessary.

Oiled Wildlife Response Kits and a mobile animal washing unit are available (see Section 3 below for details) which can assist with an initial, rapid response and may be sufficient in the case of a spill that affects less than 100 animals. These resources are intended to provide an initial treatment response only and, in the event of a large spill involving larger numbers of birds and/or other animals, additional treatment and rehabilitation facilities may need to be established either in situ or away from the spill site. It is likely this will involve using facilities that do not normally cater for this type of activity as there are few comprehensive treatment and rehabilitation facilities in NSW.

This procedure assists personnel involved in the establishment of facilities for the first-aid, cleaning and rehabilitation of affected wildlife and not the treatment processes themselves which are covered in separate procedural documents. Refer to other procedures listed at the end of this document.

2. Abbreviations / Definitions

- AMSA – Australian maritime Safety Authority
- SWMS – Safe Work Method Statement (similar to JSA)
- JSA – Job Safety Analysis
- AASFAC – Animal and Agriculture Services Functional Area Coordinator

3. Resources / Equipment

- [Oiled Wildlife Response Kits](#), provided by the Australian Maritime Safety Authority (AMSA) and maintained by each of the States/NT under the National Plan arrangements, are located in each State and the Northern Territory. The kits can be deployed quickly to a spill site and contain all of the required equipment for the initial treatment of up to 100 birds. At the time of writing, the NSW kit is held at two sites; the veterinary equipment being located at Taronga Zoo and the operational equipment at Sydney Port Authority (within a mobile wildlife washing unit which is housed in a converted shipping container). The washing unit is fully 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. The container can run up to three cleaning stations and has sufficient water capacity to run four more wash stations in an adjacent facility. The container can be deployed at short notice to a site which has access to water and power. The Animal and Agriculture Services Functional Area Coordinator (AASFAC) will request the deployment of the AMSA Oiled Wildlife Response Kit upon notification of an incident involving affected animals. The veterinary component of the kit, which is held and maintained by Taronga Zoo, should be deployed at the same time.
- Existing built facilities or temporarily erected/installed facilities such as marquees (at least 4m x 4m in size), shipping containers, mobile units, site offices
- Shower and toilet blocks
- Laundry facilities – if laundering is to be undertaken on site, separate facilities are needed for personnel clothing and towels or cloths used to dry wildlife. Alternatively, consideration may be given to outsourcing the laundering of soiled materials.
- Resources and equipment as listed in Section 3 of the following procedures:
 - [Oil Chemical Spill Wildlife Response - Triage and First Aid](#)
 - [Oil Chemical Spill Wildlife Response – Cleaning and Drying Wildlife](#)

4. Warnings

4.1. Contaminated waste

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
- contaminated towels, rags, paper, transport boxes etc
- used syringes, gloves, coveralls
- carcasses (unless these are being kept for investigative purposes)
- plastics, food scraps and other wastes from human activities

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

See also the AMSA website for information on [Management and Disposal of Oil Spill Debris](#).

4.2. Disposal of dead wildlife

Dead wildlife poses a contamination risk to other wildlife and to humans. Immediate refrigeration is recommended so that samples and specimens may be taken for pathology. Following necropsy, carcasses may be frozen, if facilities are available, pending disposal. Analysis of animal tissue or necropsy may be needed for investigations purposes and/or for scientific values.

Carcasses and organic waste suspected of being contaminated must be disposed of by the Waste Management Unit. Contaminated carcasses must not be fed to other animals.

Consultation, via the Waste Management Unit, should be undertaken with local councils and relevant waste management authorities to ensure proper disposal of carcasses.

4.3. Hygiene and quarantine

When birds and/or other 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. Any animal that is suspected of carrying an infectious disease should be immediately quarantined from others.

All personnel should be informed of quarantine guidelines and appropriate explanatory signage displayed. Facilities for staff to disinfect clothing and equipment should be deployed early in any wildlife response.

Footbaths with antiseptic (Halasept ® or similar) 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.

Personal hygiene facilities for staff, such as portable toilets, hand washing areas and showers are required. It is essential that all staff wash thoroughly before eating, drinking or smoking. These areas should be established away from the main wildlife quarantine, cleaning, treatment and rehabilitation areas.

Personnel with impaired immune systems and those with colds/flu should not be permitted near affected wildlife.

4.4. Personnel and other safety issues

During the initial deployment, most personnel will be operating in an unfamiliar environment and under considerable pressure. Steps need to be taken to minimise any hazards associated with the following:

- Manual handling – the moving of equipment, furniture, boxes of stores etc must be undertaken using the correct techniques and equipment. Refer to the Safe Work Method Statement (SWMS) [Manual Handling – inside](#) and [Manual handling – stores](#).
- Unfamiliar operating environment – personnel will be unfamiliar with many of the facility's features eg location of electrical switches, evacuation procedures etc and should be adequately familiarised with their surroundings and procedures during induction and reminders given during briefings.
- Electrical connections – the installation of electrical appliances may result in unsafe connections, especially given the close proximity to water. All facilities and power boards must have appropriate circuit breakers. These should be checked and rectified if necessary by suitably qualified electricians. Refer to the SWMS [Using a Computer](#).
- Over-work – fatigue-related injuries may occur if personnel over-extend themselves. Rosters must limit shifts to a suitable length for the type of work. Adequate rest breaks must be taken and on-going assessment made of the ability of personnel to continue in their roles. Adequate accommodation and facilities that allow people to recover from their duties is essential. Refer to the policy [Fatigue Management in Emergency Responses](#).
- Adequacy of furniture – care should be taken to minimise and correct non-ergonomic set-ups. Refer to the SWMS [Manual Handling – inside](#).
- Slips, trips, falls etc – assembling the initial work area will involve considerable activity by many people who are working around oiled animals and where washing is being undertaken. This could present hazards that could lead to slips, trips and falls. Hazards should be identified and rectified as soon as practical. First-aid facilities for personnel will be established for the incident. The location of these facilities will be determined by the medical plan and first-aid plan for the incident.
- Vehicle movements in/out of facilities, especially at shift changeover, have the potential to disrupt local traffic and need to be managed to reduce the risk of accidents.

5. Procedure

5.1. Responsibility for setting up and management of treatment facilities

The Wildlife Coordinator is responsible for identifying and advising the Logistics Section of the required wildlife treatment facilities (including the amount and type of space, fixtures, fittings and services required). 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.

If facilities are co-located, day-to-day management responsibility of wildlife treatment lies with either Rescue or Rehabilitation Divisional Commander as determined by the Wildlife Coordinator.

Where the facilities are spread over a number of sites, day to day management of the individual facilities will be the responsibility of the Divisional Commander responsible for the procedures being carried out at the particular facility. The Divisional Commanders will be assisted by Logistics Support personnel from the Wildlife Unit to achieve the effective management of the facilities. Refer to the role description – [Wildlife Coordinator & Logistics Support](#).

5.2. Timing and criteria for setting up treatment facilities

Ideally, facilities for the collection, holding and isolation of affected animals should be established within 24 hours of the spill. Cleaning and rehabilitation facilities should be operational within 48 hours. The location of the spill and the location, numbers and species of animals affected may

determine the type of facilities used. Options may include permanent facilities if any exist nearby; temporary facilities set up in existing buildings; or mobile units/tents brought in and/or erected nearby. Facilities should be located as close as possible to the field of operations; preferably within one hour of travelling time.

Built facilities capable of accommodating animal treatment facilities should be identified in advance of any spill occurring and should be reviewed/updated annually as part of regional incident planning.

The following criteria need to be considered when identifying adequate facilities:

- Availability for an extended period (possibly months, depending on the scale of the operation)
- Parking - adequate and easy access for unloading animals and waste disposal
- Location - close enough to the spill site to avoid prolonged travelling (preferably less than 1 hour away)
- Water - access to an unlimited supply of water, which requires heating. This is crucial as it takes 600-1000 litres to wash and rinse one bird and additional water is required for pools, general cleaning, showers, food preparation and so on
- Ventilation - facilities must be adequately ventilated (poor ventilation is linked to disease in animals and personnel). Personnel should be monitored for exposure to toxic fumes. Monitoring regimes will be based on risk assessments of the particular substance involved by the Environmental Services Functional Area and/or the NSW Health Services Functional Area.
- Heating/cooling – facilities must be able to be heated/cooled as required.
- Communication - telephones and good communications systems can be established
- 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
- Size - large enough to accommodate small through to large incidents and there should be sufficient space for:
 - an admissions area
 - areas for incident control/administration, communications, media liaison, induction/training, meetings, briefings
 - facilities for personnel – lunch rooms, ablution blocks, first aid etc.
 - storage for equipment and stores
 - triage & first aid (vet hospital) with a quarantine area, intensive care area
 - separate indoor animal holding areas (pre-washing, during drying and for sick animals)
 - washing and drying stations and drying rooms (eg shipping containers, tents, buildings etc)
 - rehabilitation (post-wash) facilities including:
 - animal food preparation and storage (including mobile cool rooms and freezers)
 - indoor and outdoor housing for birds and/or animals
 - pools (either available or there is potential to erect portable pools)
- Security – it must be possible to secure facilities from both people and animals (eg dogs, cats, foxes, raptors and vermin)
- Contaminated waste storage - collection/disposal will need to be arranged
- Accommodation and service providers are nearby – eg catering, first-aid

5.3. Space required

Facilities will be required for the first aid, cleaning and rehabilitation of affected animals and the size of the facilities required will depend on the numbers and species of animals affected. As a rough guide, if all of the required facilities were to be co-located, the following space would be needed for an incident involving 500 oiled birds:

- 3,000 square metres of indoor space to accommodate:
 - Bird holding rooms for 500 birds (approx 900 sq metres). This will be dependent on the animals involved – see tables at 5.4.2, 5.4.3.2 and 5.5.3 for suggested minimums)
 - Washing and rinsing areas (approx 240 sq metres)
 - Bird food preparation and storage (approx 180 sq metres)
 - Admissions area
 - Triage/first aid facilities
 - Quarantine
 - Rooms for incident control, administration, induction/training, communications/media, meetings, dining room, toilets/showers
- 2,000 square metres of outdoor space to accommodate:
 - 6 pools (5x3m)
 - Miscellaneous cages/enclosures
 - Wash down area
- Additional space would be required for parking vehicles/equipment
- Waste storage

For further suggestions on the setting up of wildlife treatment facilities and the amount of space required see:

- [Oiled Wildlife and Your Facility – What Does It Take?](#)
- [Oiled Wildlife Facility and Staffing Requirements](#)

5.4. Facilities Required

It is preferable that all facilities required for the wildlife response are co-located but logistics and the availability of existing facilities or space to construct temporary facilities may prevent this. Suitable locations will need to be found for the following facilities.

5.4.1. Admissions area

During a large spill, there may be large numbers of wildlife arriving at the treatment facilities and it is important to have an admissions area where the crates or boxes containing the animals can be sorted and arranged systematically to ensure that animals are admitted in the order of their arrival. This is important to ensure that waiting periods are minimised.

The admissions area needs to be readily accessible to vehicles transporting animals to and from the facility. It should be large enough to accommodate desks for several people and have space to accommodate numbers of boxes and crates. The amount of space required will depend on the size of the spill and the numbers and species of wildlife affected. A quiet, well-ventilated area is required and the temperature should be maintained at around 25 °C. Boxes and crates should be spaced to allow adequate ventilation and arranged in a way that provides easy access for handlers.

If treatment facilities are not co-located, a separate admissions area will be required at each facility.

5.4.2. Triage/first-aid facility

It is preferable to have a triage/first-aid facility on-site, as close as possible to the forward control, so that initial assessment/triage can be conducted as soon as possible. This should be done away from the main activity and noise and would ideally be located between the admissions areas and the rehabilitation area.

If built facilities are not available, large marquees (at least 4m x 4m) should be erected at the first-aid site. Separate holding cages are required for untreated animals and treated animals awaiting transfer to the cleaning and drying facility. As a guide, minimum temporary enclosure sizes are:

TEMPORARY HOLDING ENCLOSURES	
Birds	Size - Length x Width x Height (metres)
Small passerines, parrots and pigeons - finches and wrens	0.3 x 0.2 x 0.2
Large passerines, parrots and pigeons - magpies and cockatoos	0.5 x 0.5 x 0.5
Small waterbirds – ducks and grebes	0.4 x 0.4 x 0.4
Large waterbirds – swans and herons	0.7 x 0.7 x 0.7
Small seabirds – gulls, cormorants, terns and penguins	0.4 x 0.4 x 0.4
Large seabirds – albatrosses and pelicans	0.7 x 0.7 x 0.7
Small raptors – kestrels and hobbies	0.5 x 0.5 x 0.5
Large raptors – eagles, hawks and falcons	1 x 1 x 0.5
Brush turkeys and emu chicks	0.7 x 0.4 x 0.5
Adult emus	1.5 x 0.7

Other Animals	Size - Length x Width (metres)
Water rat	0.5 x 0.3 x 0.3
Small turtles	0.5 x 0.3 x 0.3
Large turtles	1.0 x 0.6 x 0.5
Seals (other than leopard seals)	1.5 x 1.8 with solid walls 1.0m high
Leopard seals	Dependent on the size of the animal but must be large enough to allow it to fully stretch in all normal postures.
Cetaceans	Triage of cetaceans would be undertaken on the beach

Holding areas for wildlife need to be well-ventilated and able to be maintained at a constant temperature suitable for the particular species.

In addition to holding space for animals, the first-aid facility will require:

- Enough working space for up to 5 first-aid teams for a large incident (eg 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 plus shelving for drugs and equipment.
- An area set aside for intensive care for weak or debilitated animals
- An isolation area, with its own separate ventilation, for animals suspected of having an infectious disease
- Access to refrigerators and freezers should be available nearby for storage of carcasses pending disposal.

- Storage facilities for liquid and solid contaminated waste (with easy access for waste disposal collection)

5.4.2.1. First-aid stores and equipment required

Refer to procedure – [Oil Chemical Spill Wildlife Response – Triage and First Aid](#).

5.4.3. Cleaning and Drying Facilities

5.4.3.1. Cleaning facilities

Cleaning and drying facilities should be co-located. 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).

Suitable containers are required near the cleaning facility to store contaminated waste such as water and used towels, pending appropriate disposal as determined by the Waste Management Unit.

The amount of space required will depend on the number of and species of animals to be washed but should be large enough to accommodate several large sinks, several large washing tables and several rinsing stations with sufficient working space at each one to allow at least 2 people to hold an animal.

5.4.3.2. Drying facilities for birds

The drying facility for birds 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 solid-bottomed drying enclosures which, in combination with warm air blowers, provide a suitable environment for most sea birds, shore birds and some fresh water birds. The floors of the enclosures should be covered with clean absorbent material.

Birds must have sufficient space to allow them to flap their wings and preen and to move away from any heat source. The size of the enclosure required will vary depending on the species concerned but the following should be considered as minimum sizes.

BIRD DRYING ENCLOSURES	
Birds	Size - Length x Width x Height (metres)
Small passerines, parrots and pigeons - finches and wrens	0.6 x 0.45 x 0.45
Large passerines, parrots and pigeons - magpies and cockatoos	1 x 1 x 1
Small waterbirds – ducks and grebes	0.6 x 0.6 x 0.6
Large waterbirds – swans and herons	1 x 1 x 1
Small seabirds – gulls, cormorants, terns and penguins	0.6 x 0.6 x 0.6
Large seabirds – albatrosses and pelicans	1.5 x 1 x 1
Small raptors – kestrels and hobbies	2 x 2 x 1
Large raptors – eagles, hawks and falcons	3 x 3 x 1
Brush turkeys and emu chicks	2 x 2 x 0.5
Adult emus	5 x 5

In very still, warm weather, birds can be placed outside in the sun to dry (with shade available).

5.4.3.3. Drying facilities for marine mammals

For marine mammals, such as seals, drying is not generally required for healthy adults who can be placed directly into outdoor enclosures and allowed to dry naturally.

Drying using cool air blowers is recommended for unweaned pups and for debilitated individuals, who should be housed in enclosures which are long enough for them to stretch out – 1.5 x 1.8 metres is usually adequate. The ambient temperature of the drying area should be 10-12°C but this may be varied depending on veterinary advice.

5.4.3.4. Stores and equipment required

Refer to procedure – [Oil Chemical Spill Wildlife Response – Cleaning and Drying Wildlife.](#)

5.5. Rehabilitation facility

Once animals have been cleaned and dried they are moved to rehabilitation facilities to recuperate. Indoor and outdoor facilities may be required, depending on the species concerned, and 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.

5.5.1. Indoor housing for birds

Indoor housing enclosures for individual birds are as per the tables at Section 5.3.3.2 above. 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. Facilities for provision of food and water must also be available.

Indoor enclosures can be constructed of cloth or canvas/ tarpaulin-covered wire, plywood, fibreglass or other available materials. 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 not be used.

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

5.5.2. Outdoor housing for birds

Outside 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.

Cages should be large enough to allow birds to stretch and flap their wings, with the exception of large pelagic birds such as albatrosses, gannets or boobies which are unlikely to fly in captivity. Suitable sizes and the number of birds that can be housed are shown below.

OUTDOOR BIRD ENCLOSURES		
Birds	Size - Length x Width x height (metres)	No of birds
Small passerines, parrots and pigeons - finches and wrens	3 x 2 x 1	8
Large passerines, parrots and pigeons - magpies and cockatoos	5 x 2 x 2	4
Small waterbirds – ducks and grebes	4 x 2 x 2	2
Large waterbirds – swans and herons	6 x 2 x 2	2
Small seabirds – gulls, cormorants, terns and penguins*	4 x 2 x 2	2
Large seabirds – albatrosses and pelicans	6 x 3 x 2	1
Small raptors – kestrels and hobbies	5 x 3 x 3	1
Large raptors – eagles, hawks and falcons	15 x 10 x 4	1
Brush turkeys and emu chicks	5 x 3 x 2	2
Adult emus	10 x 10 x 2	2

*Penguins may be held together in 'flocks' of up to 10 in a 6 x 3 metre enclosure

All birds need to be able to access a pool of some sort to allow them to wade or swim. 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. Pools can be constructed from plywood with heavy duty plastic as a lining but they must be covered so that birds cannot escape or predators get in. Pool water should be reticulated, filtered and kept clean. Access ramps in and out of the water should be provided to prevent the risk of waterlogged birds drowning.

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

At least 6 large pools are recommended for testing of birds' waterproofing. Each one should be approximately 10 metres in diameter.

5.5.3. Indoor housing for marine mammals

Generally marine mammals do not require indoor housing. Once they have been washed they are placed in outdoor enclosures to dry.

For individual animals considered to need indoor housing (sick or emaciated individuals) considerations are as follows:

- They should be established quiet areas which have good ventilation but are free from draughts
- Access passageways and 1 metre wide gates are required to allow safe access for handling of the animals
- Enclosures:
 - Should be 2 x 2 metres with walls 0.6 m high
 - Should have a pool area able to be flooded to a depth of about 0.4m
 - All surfaces able to be cleaned with a pressure hose
 - Floor covered with a pallet of smooth moulded plastic slats or non-slip rubber`

- Localised heat source (e.g. infra red lamp) should be available if required
- Cetaceans and/or dugongs < 5 metres may be held by approved facilities after triage.

5.5.4. Housing for seals

Requirements will vary depending on the animals concerned but, as a guide, the following would be required for seals.

- A large pen (approx. 3.4 by 2.1m) able to be filled with water to a depth of at least half a metre
- Access to a pool area with at least 16 square metres surface area, plus haul-out areas
- Visual barriers to protect the animal from the sight of humans walking past
- Adequate shade/shelter from weather

5.5.5. Housing for turtles

- Turtles that are unable to swim, or weak turtles that cannot lift their heads to breathe should be placed on moist foam pads and covered with wet towels, or placed in a shower box.
- Turtles that can swim must be held in a pool that allows plenty of room to swim and dive. Marine turtles can cope well with exposure to freshwater (at the right temperatures) for up to 6 days, but long term (months) exclusion from salt water results should be avoided (Limpus, 2000). Where possible, marine turtles should be kept in salt water. Chlorine can be added at less than 1ppm to reduce bacterial and algal growth but higher levels will irritate the eyes.
- Any substrate on the bottom of the tank must be of sufficient size that it cannot be ingested. Gravel should be avoided for hatchlings. Hatchlings may need to be provided with rafting material so they can trap food. This rafting material should not be ingestible. Abrasions from rough sides on cement tanks have been reported
- Water temperature must be maintained between 25-29.5°C. Even though this temperature may be higher than local waters, it is the optimum range for rehabilitation. Fluctuations in temperature should be avoided; necessary changes of more than 1-2° should take place over several days. Prior to release, turtles should be gradually acclimatised to the temperature of local waters.
- Overcrowding can lead to biting among turtles. Loggerhead and Hawksbill turtles will bite other turtles when confined, so separation is required. Green turtles are not usually aggressive to other turtles.

5.5.6. Housing for sea snakes *

- Sea snakes are venomous and must only be caught, handled and treated by persons experienced in snake handling.
- Bites from sea snakes can be life threatening so enclosures must be secure and escape-proof.
- Tropical marine tanks are required for the captive maintenance of sea snakes and those intended to house sea kraits (family Laticaudidae), need to be provided with some land area where they can leave the water.
- Maintenance of water quality is important and aquaculture technology offers a range of filtering and water treatment options. Expert advice should be sought.
- One adult sea snake (<1m total length) requires a marine aquarium at least 100cm by 40cm by 60cm high; 50 percent more area will be required for each additional adult of similar size. Individual sea snakes >1m will require proportionally larger cages at least 120cm long.
- Olive sea snakes, *Aipysurus laevis*, and other demersal (bottom-dwelling) reef species will benefit from the provision of shelter sites on the floor of the tank as these snakes behave remarkably like their terrestrial counterparts in seeking shelter beneath solid cover.
- Yellow-bellied sea snakes are pelagic, that is, snakes of the surface waters of the open ocean, and will probably fare best in a tank without shelter structures.

* Sourced from [Queensland Government Code of Practice: Captive reptile and amphibian husbandry](#).

For detailed information on catching, transporting, rehabilitation, release and euthanasia refer to NPWS Marine Wildlife Management Manual.

5.5.7. Housing for water rats *

- Water rats should have access to water at all times. An enclosure measuring 300 cm x 300 cm (including a pond 100 x 100cm x 50 cm deep) is suitable for 2 animals. Additional floor space of 200 cm x 200 cm is required for each additional animal.
- Enclosures should be constructed using materials such as glass, perspex and metal as most rodents will gnaw through wood, some plastics and fine metal mesh. Enclosure lids need to be well-fitted and can be made from flywire providing they are out of animal reach.
- Shelter and nest boxes should be provided and may include purpose-built boxes or hollow logs, pieces of bark, tussock grasses and plastic or cardboard tubes or boxes
- The substrate should be absorbent: suitable materials are sawdust, (fine-grained) sand, leaf litter and soil.
- Enclosures should be placed where a temperature of 15-25 C can be maintained. They should be well-ventilated and easy to clean.

Sourced from Medicine of Australian Mammals, Larry Vogelneust and Rupert Woods, 2008

5.5.8. 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
- As a guide, an area of between 100 to 200 square metres may be required

5.5.9. Stores and equipment required

Refer to procedure – [Oil Chemical Spill Wildlife Response – Rehabilitation of Wildlife](#)

5.5.10. 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.

6. References

Policies

- NSW DPI policy - [Fatigue Management in Emergency Responses](#)
- NSW DPI policy - [Occupational health and safety in emergency management](#)

Procedures

- [Selecting an EOC location](#)
- [Emergency Operations Centre Set Up and Resources](#)
- [Task request procedure](#)
- [Wildlife Response – Cleaning and Drying Wildlife](#)
- [Wildlife Response – Pre-emptive action](#)
- [Wildlife Response – Rehabilitation of Wildlife](#)
- [Wildlife Response – Release of Wildlife](#)

- [Wildlife Response – Scaling Down and Demobilisation Response](#)
- [Wildlife Response – Search and Rescue](#)
- [Wildlife Response - Transporting Wildlife](#)
- [Wildlife Response – Triage and First Aid](#)

Forms

- [Task Request Form](#)

Safe Work Method Statements / Job Safety Analysis

- [Manual Handling – inside](#)
- [Manual handling – stores](#)
- [Using a computer](#)

Role descriptions

- [Rehabilitation Division](#)
- [Rescue Division](#)
- [Wildlife Coordinator & Logistics Support](#)

Information

- Field Manual: Rescue and Rehabilitation of Oiled Birds, Erna Walraven, Zoological Parks Board of NSW, June 2004.
- [Management and Disposal of Oil Spill Debris](#)
- Medicine of Australian Mammals, Larry Vogelneust and Rupert Woods, 2008
- NPWS Marine Wildlife Management Manual
- [Oiled Wildlife and Your Facility – What Does It Take?](#)
- [Oiled Wildlife Facility and Staffing Requirements](#)
- [Oiled Wildlife Response Kits](#)
- [Queensland Government Code of Practice: Captive reptile and amphibian husbandry](#)
- [Wildlife Information Network and Wildpro](#)

Legislation

- [National Parks and Wildlife Act 1974](#)
- [Threatened Species Conservation Act 1995](#)
- [Environment Protection and Conservation Act 1999](#)
- [Work Health and Safety Act 2011](#)
- [Work Health and Safety Regulation 2011](#)

7. Appendices