

# Charles Darwin University Animal Ethics Committee

## Standard Operating Procedure:

### DPAW SOP 3.2021 Mist Net trapping for birds

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# Standard Operating Procedure

## MIST NET TRAPPING FOR BIRDS

Prepared by: Species and Communities Branch, Science and  
Conservation, Department of Biodiversity, Conservation and Attractions

Prepared for: Animal Ethics Committee

Version 1.2

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### Version 1.2


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# 1 Purpose

Mist netting is a widely used technique for studying small to medium sized birds. Mist nets are easily transported and erected and have proven successful in a variety of habitats. Birds are captured live and usually transferred to soft containment for transfer to a banding station. The usual purpose is for a banding project, where in most cases the age, sex and condition of the bird are recorded, morphometric measurements taken and a uniquely numbered leg band applied. A range of alternative trapping methods can also be employed; however, mist nets are most commonly used in Western Australia.

This standard operating procedure (SOP) provides advice on the capture of birds using mist nets only.

# 2 Scope

This SOP has been written specifically for scientific and education purposes, and endorsed by the Department's Animal Ethics Committee. However, this SOP may also be appropriate for other situations.

This SOP applies to all fauna survey and monitoring activities that may require the use of mist nest to capture birds, undertaken across the State by Department of Biodiversity, Conservation and Attractions (hereafter Department) personnel. It may also be used to guide fauna monitoring activities undertaken by Natural Resource Management groups, consultants, researchers and any other individuals or organisations. All Department personnel involved in the use of mist nets should be familiar with the content of this document.

All projects using mist nets to capture birds must be approved by the Department's Animal Ethics Committee. Specialised mist nets or other traps manufactured by other businesses or with different mechanisms may also be appropriate and their use is not excluded. Approved projects that prefer to use alternative mist nets or other traps to those mentioned here may do so if the differences are described in detail, demonstrated to be effective and have acceptable levels of impact on animals. Examples of other bird trapping techniques include cannon-netting, walk-in traps, wader-netting, canopy-netting, cage traps, spring traps, nest box traps, Bal Chatri traps, Dho-gaza nets and noose-carpet traps (see Section 9). Personnel should be appropriately trained or supervised when using any method.

Projects involving wildlife may require a licence under the provisions of the *Wildlife Conservation Act 1950* and/or the *Biodiversity Conservation Act 2016*. Personnel should consult the Department's Wildlife Licensing Section and Animal Ethics Committee Executive Officer for further guidance. In Western Australia any person using animals for scientific purposes must also be covered by a licence issued under the provisions of the *Animal Welfare Act 2002*, which is administered by the Department of Primary Industries and Regional Development. This SOP complements the *Australian code of practice for the care and use of animals for scientific purposes* (The Code). The Code contains an introduction to the ethical use of animals in wildlife studies and should be referred to for broader issues. A copy of the code may be viewed by visiting the National Health and Medical Research Council website (<http://www.nhmrc.gov.au>).

## 3 Definitions

**Mist net:** A fine, lightweight nylon, terylene or polyester net suspended between two poles, often positioned across main flight paths to intercept birds effectively for live capture.

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

**Passerines:** Also known as perching or song birds belonging to the avian order Passeriformes. Passerine birds generally include small and medium sized birds that have three toes pointed forwards and one back. They are often brightly coloured.

**Capture myopathy:** A condition associated with the capture and handling of many species of mammals and birds that results in degeneration of skeletal and/or cardiac muscle.

**Carpal joint:** Highly specialized wrist joint, the foremost point of a folded wing in birds.

## 4 Procedure Outline

### 4.1 Setting up the net

A mist net is supported horizontally as net panels or shelves between a series of horizontal shelf strings which are themselves attached to vertical poles via string loops (see Figure 1). The shelf strings are set apart at a distance which will allow enough of a pocket for the bird to fall into after it has hit the main panel of the net (typically around 50cm shelf string spacing for small passerines).

#### 4.1.1 Selecting the sites

Optimal use of a mist net will depend on the target species and habitat characteristics at the study site. It is important to avoid erecting mist nets on sites where the outline of the net is clearly revealed against a monotonous background such as the sky, open water or uniformly coloured fields. It is best to select sites that will remain in shade most of the time as nets can be more obvious in the sun, and avoid windy conditions as this may also make nets more obvious.

#### 4.1.2 Setting up mist nets

(a) Two people are generally required to set up a mist net. Pace out the distance or length of the net first to decide on the most appropriate positioning with the least obstructions. Remove or restrain any unavoidable obstructions.

(b) As a general rule, push the pointed end of the first pole vertically into the ground; do not pound with a mallet as this will damage the pole. Stabilise the pole with two securing lines (guy chords) that angle away at 45° and are tied at least half-way up the pole. Securing lines can be tied to fixed objects (e.g. rocks or bushes) or pegs/stakes can be used.

(c) Find the bunched string loops at one end of the bagged net and carefully run part of the mist net out of its bag. Keep the mist net taut and off the ground to avoid catching on rocks and vegetation.

- (d) Arrange the string attachment loops from top to bottom (it is useful if they're numbered) and slide the string attachment loops in order over the pole. Most nets will have one loop that is a different colour to indicate it as the top shelf string.
- (e) Unroll the remaining portion of the net, taking care not to let the net drop to the ground or onto anything else where it may get tangled. Take the second pole and repeat the steps with the other end of the mist net ensuring it is pulled taut. If multiple nets are being put up in the same line the poles can be shared between neighbouring nets. The loops from each net need to be put onto the pole in order as described previously but they need to be alternated with each other.
- (f) Tie off each of the securing lines so the mist net is held firmly in place.
- (g) The erect mist net should have tight horizontal shelf strings with as little sagging as practicable. The tension on the net material is determined via vertical adjustment of the spacing of the shelf strings. The optimum spacing will be determined by wind conditions, the nature of the target species that are desired to be caught and the experience of the operator.

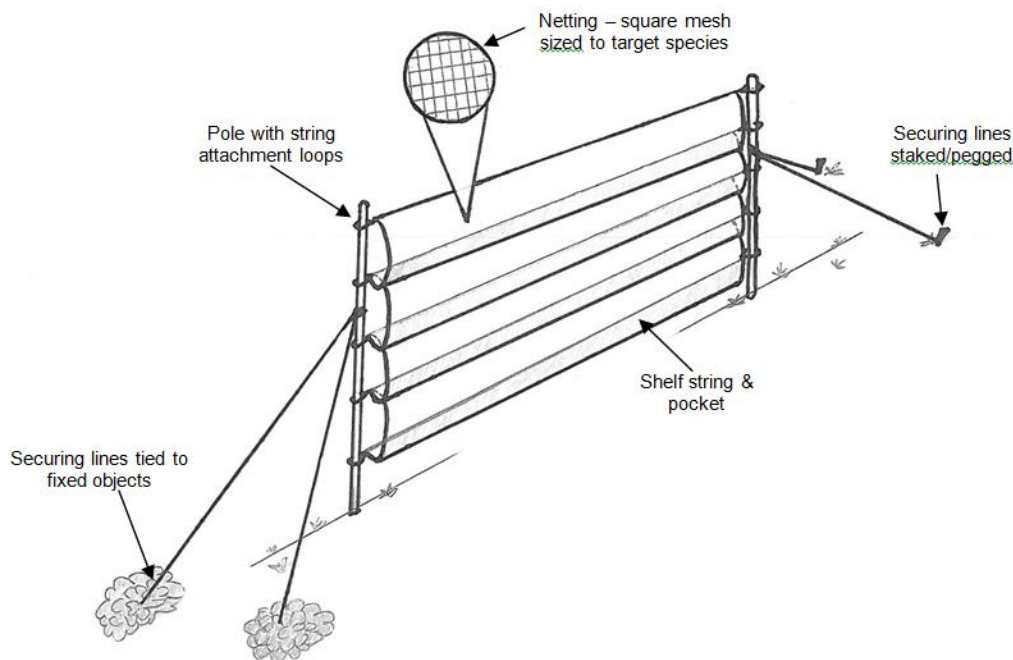


Figure 1 Diagram of a mist net set up. Image: Rebecca Kay/DBCA

- (h) The tautness of the mist net can be controlled by adjusting tension on the securing lines. The depth of each pocket (within each shelf) is controlled by adjusting the distance between the strung loops. Use an object with a weight similar to that of the species likely to be caught to ensure that a bird caught in the bottom pocket will not reach the ground.
- (i) Birds caught in a net close to the ground are more likely to injure themselves. Clear away any twigs or branches that might catch in the fine mesh and interfere with net function. Setting the net 30-40cm above the ground is ideal when the ground is bare or above the level of the longest grass to prevent ants entering nets from the vegetation (alternatively flatten any grass that is likely to cause problems).
- (j) Netting over water should be avoided as extreme care must be taken to avoid drowning of both target and non-target species. When mist netting over water, it is



advisable to use an object with a weight similar to that of the species likely to be caught to test the extent of sag in the net, and to allow a large margin for error in case heavier birds enter the net.

(k) Members of the public, animals such as domestic dogs and non-essential personnel must be kept away from the area whilst the net is in operation. Be aware of wildlife and livestock that may reside in the area. Avoid setting up mist nets along tracks that are used by animals to access food and water.

#### **4.1.3 Net specifications/considerations**

Mesh size: optimal mesh size is directly related to the size of the target species. A variety of mesh sizes is available for use depending on the birds being targeted. Mesh size is typically referred to in two different ways. For catching small and medium sized passerine birds for example appropriate net sizes are 32mm and 60mm square mesh (stretched knot-to-knot) or 16mm and 30mm (barn box) which are equivalently the same sized nets. These two sizes are a general guide only. There are many variations in sizes and their designed target species between manufacturers which should be considered while planning what nets to use. Mesh size can also be used to avoid catching certain species, particularly small ones where larger birds are the target. If the mesh size is too small the bird may not become entangled enough to stay caught whereas if the mesh size is too large the bird may get through the net.

Number of shelves: most mist nets have four shelves. These are adequate for most bird studies, however some situations achieve more efficient results with single or double shelves (e.g. where the canopy is lower than the mist net).

Length of mist nets: 6m, 9m, 12m or 18m nets are readily available. Longer nets are more difficult to set up as they require longer runs and are much heavier.

Poles: upright poles may be in the form of aluminium sections that slot together or 4 m lengths of bamboo or similar material (e.g. wooden or metal poles, saplings or galvanised pipes). Two poles are required for each net.

Securing lines (guy cords): braided nylon cord (5mm diameter) is sufficient. Two ropes should be allocated to each pole with pegs and a mallet to secure them where fixed objects are not available. On a long net run, where nets are joined together, it may be desirable to have a third rope at each end, in line with the net run.

Bird bags: made from calico or cloth. Bags must be turned inside out or preferably stitched with seams located on the outside of the bag to prevent injury to birds as they may be entangled in loose cotton when removed from the bag for processing. One clean bag should be used per bird.

Furling stick: hooked sticks which can be used to pull down high shelf strings and prevent damage to the net and birds.

Crochet hook/needle: A 1.5mm or 1.75mm crochet hook with a modified handle attachment is recommended to aid in the extraction of any birds that get severely tangled. A stop watch may also be useful to monitor intervals between checking nets.

Net cutting equipment: personnel should have sufficient training to remove birds without having to cut nets. However, where absolutely necessary, always carry something to cut nets when extractions are particularly difficult (e.g. fine scissors).

Extra equipment required may include: overed holding boxes for birds, torches if working at night, pegs and ropes to hold back branches, pruning gear where habitat alteration is permitted, band removing pliers, electrolyte solution or use of sugar sachets to aid recovery (see Section 4.3(k)).

Each net should be numbered and uniquely identifiable. The number of nets in use and their exact locations must be recorded upon set up of nets. Ensure all nets are checked and removed from the field at the end of the session.

#### 4.1.4 Storage of nets

Mist nets are usually stored in cloth bags with the string loops of each end bunched and tied together and one bunch at the bag's opening. When nets are not in use they are removed or furred (by rolling and tying off with flagging tape at one metre intervals) so that they will not continue to entangle birds or other animals, or unfurl in the wind (see Figure 2). Training in correct, tight furling techniques by an ABBBS license holder is recommended. Even small sections of loosely-furred net can entangle flying birds. All loose sections must be attended to.



Figure 2 A furred mist net. Photo: Sarah Comer/DBCA

## 4.2 Operating mist nets

Due to the potential risk of injury and death to birds, mist nets should only be used where the expected benefit outweighs the risks for the target species or population and other less invasive methods have already been rejected as unsuitable. The netting forming the shelf must have sufficient vertical slack in it to form a pocket between the shelf strings. Birds are caught when they fly or walk into the net, becoming entangled or ending up in a pocket of netting supported from a shelf-string. As a general rule, mist nets should not be left any longer than 20 minutes during the day. Consider habitat, time of day, weather conditions and number of birds likely to be caught when choosing how many nets to set up. Nets must be monitored at all times and captured birds removed immediately. Nets must be closed (i.e. correctly furred) when not in use. Checking nets involves walking the full length of the net paying particular attention to the bottom pocket. In low light conditions a head torch may be useful for checking nets and extracting birds. An equipment and processing station should be set up out of sight and some distance away from nets to avoid disturbing birds in

the area. This should be in the shade or under a shelter so that birds can be kept out of direct sun while waiting to be processed (see Section 4.3(i)).

Some birds are too large to be caught in mist nets and can cause significant damage either to the net or themselves when intercepting a mist net. Field personnel must be prepared to deal with possible by-catch species. Raptors for example have potential to inflict serious injury on themselves and animal handlers. The number of qualified animal handlers should be appropriate for the maximum number of birds which may be expected to be caught. One person should be responsible for making decisions regarding closing nets when too many birds are caught at once and releasing birds without processing if birds are becoming stressed due to extended holding times.

### 4.3 Extracting birds from the net

On entry to a net, birds can become tangled by wings and feet in addition to their heads passing through the netting. The captured individual is removed by hand.

- (a) Remain quiet when checking nets so as not to frighten birds that are in or near the net.
- (b) To reduce panic and injury to birds, always approach the nets slowly, particularly when there are birds in the net.
- (c) Animals such as dogs and cats and non-essential personnel must be kept away from the area whilst the net is in operation.
- (d) Prioritise which birds should be removed first. Start with those that are most at risk of injury or stress (e.g. birds that are in contact with each other, at risk of being stood on or are in direct sun). Remove any objects that may impede extraction or potentially injure birds e.g. binoculars, gloves and hard hats where applicable.
- (e) To extract a bird from a mist net, first identify the side on which the bird entered. This can usually be determined by seeing which side of the shelf string the pocket is on. Look for bare bird belly (this is seeing the belly of the bird free of net) (see Figure 3) to confirm that you are trying to extract it from the correct side. Put your hands in the pocket and ensure that if the birds tongue is protruding, netting is free of the tongues forked projections and push the tongue back into the bird's mouth if hanging out. Untangle until it can (1) be taken by the base of the legs and carefully drawn away from the net, clearing feet, wings and head in sequence (the reverse of the order in which the bird entered the net) (see Figure 3) or (2) be cleared of one foot, one wing, the head and then the other wing and other foot as depicted in Figure 4 (the 'rolling' method, see Lowe 1989).
- (f) Blowing on the feet can relax the feet and aid disentanglement. Blowing on the feathers can assist in seeing net strands against the bird's body.
- (g) Hold the bird by wrapping your index and middle finger around either side of the bird's neck while cradling the body (but not tightly) with the palm of your hand and other fingers (also known as the 'banders grip', see Figure 5). This is suitable for most small birds. Extreme care must be taken with very small delicate species. Refer to the Department SOP for *Hand Restraint of Wildlife* for further advice on handling techniques.
- (h) Birds should be monitored closely for stress on first approach to the net and during extraction. If the bird is looking unwell or extraction is taking too long (over 5min) seek

assistance from a more experienced person. If there is excessive difficulty in untangling the animal, the net should be cut away to prevent undue stress. People often have trouble when a net is caught tightly over the carpal joint (see Figure 3). Generally a cut to a single strand of net under the carpal joint will loosen the net enough for a safe extraction. The bird should be checked before release to ensure no netting remains on the bird.

(i) Birds which are unharmed should be either immediately released at the site of capture or placed into a calico or cloth bag for processing, then released as soon as possible, preferably within 10 minutes. A processing station should be set up where all birds are to be measured, banded etc. A 'clothes line' set up is used to store birds (one bird per bag only) (see Figure 6). Once a bird is bagged it is immediately pegged on the 'clothes line' in order of waiting time and priority. Some species such as *Gerygones* are more susceptible to stress than others. Birds which have had a rough extraction should also be prioritised. Never put a bird in a bag down for any reason to avoid the bird being squashed or forgotten. The clothes line should never be in the sun and the bags should not touch. At least one person must be responsible for the birds at all times.

(j) If a bird has been handled, do not release it into mid-air (i.e. do not throw it) as it may fall to the ground if injured or in shock. Turn it right side up and allow it to sit on the hand or ground to become oriented. Birds that are unable to fly may be suffering from a slight strain to the wings. Place them on a perch in good cover and they will usually recover rapidly.

(k) Birds which are suffering from thermal stress should receive appropriate attention. This can be determined by symptoms such as gaping, panting, closed eyes, a drooping head and minimal movement. A bird suffering from thermal stress can initially be placed in a suitable quiet holding area which provides warmth or shade to allow recovery before release. Honeyeaters and heat stressed birds may be offered an electrolyte and water solution (e.g. Spark) from a teaspoon while they are being held in the hand or in a dish in the birds' holding box to aid recovery. It is not recommended that birds are hydrated via a crop tube unless the animal handler is competent to do so.

(l) Birds with treatable minor injuries that cannot be released immediately or those failing to recover from thermal stress should be presented to a veterinarian or a registered wildlife carer for treatment. For further information refer to the Department SOP for *First Aid for Animals*.

(m) Birds that have injuries that are untreatable or which would compromise their survival in the wild should be euthanased using one of the techniques described in the Department SOP for *Humane Killing of Animals under Field Conditions*.



Figure 3 A singing honeyeater being removed from a mist net. Note the feet being extracted first with netting only remaining around the carpal joint. Photo: Mark Blythman/DBCA



Figure 4 A western ground parrot being removed from a mist net. Photo: Neil Hamilton/DBCA



Figure 5 A rufous whistler in the 'banders grip'. Photo: Mark Blythman/DBCA.



Figure 6 A 'clothes line' set-up. Photo: Mark Blythman/DBCA.

#### 4.4 Maintenance of nets

- (a) Nets must be maintained in good working order.
- (b) Neglect will lead to unnecessary deaths of animals and could lead to prosecution of responsible personnel under the *Animal Welfare Act 2002*.
- (c) Any damaged nets requiring attention need to be noted and repaired or replaced as soon as possible, prior to subsequent use.

### 5 Level of Impact

The impact of mist netting is usually moderate but temporary. If undertaken by a suitable person, any stress to an animal should be short term.

Potential impacts include:

- Predation while in the net or being released
- Hypothermia and hyperthermia (if the animal remains in the net too long)
- Effects on breeding (net proximity to nests and young)
- Heatstroke
- Dehydration
- Starvation
- Capture myopathy in susceptible species
- Distress (due to confinement, discomfort, social isolation, separating parent and offspring, exposure to predators)
- Conflict and death when re-establishing social status in groups after an absence.

Impact to captured birds may arise through injuries sustained when hitting the coarser shelf strings, predation (typically by ants, other birds or snakes), exposure to excessive heat or cold, poor storage, poor handling techniques during extraction and processing.

## 6 Ethical Considerations

To reduce the level of impact of mist nets (and other trapping techniques) on the welfare of birds, there are a number of ethical considerations that should be addressed. Department projects involving mist netting or other trapping devices for the capture of birds will require approval from the Department's Animal Ethics Committee.

### 6.1 People

The public can be a major hazard to birds caught in mist nets as people passing through the netting area may attempt to release a bird and cause injury due to a lack of the required training. This risk needs to be minimised. The risk of people and other animals walking into nets must also be considered as well as proximity to nets e.g. walking past with a fishing rod can potentially tear a net. Post signs if necessary. Personnel must also behave appropriately during the operation of mist nets i.e. always work quietly and avoid raised voices or running.

### 6.2 Frequency of trapping

To reduce the impact of trapping on animals, consideration should be given to minimising the frequency of trapping at the same site required to achieve the goal of the activity.

### 6.3 Handling time

To ensure minimal stress to the birds, they should only be handled for as long as required to identify, apply bands and collect any necessary measurements. Extraction shouldn't take longer than 5min. If a bird cannot be extracted safely the net should be cut. Experience with removal of birds from the net is essential to ensure that stress levels are acceptable. Following extraction from the net, birds should be processed and released within ten minutes. Research into the individual species likely to be caught during field work is recommended as some species are more prone to stress than others.

### 6.4 Predators

Nets must be monitored at all times to reduce the risk of exposure and vulnerability leading to predation events. Care should be taken to discourage curious predatory species and hence avoid possible entanglement and injury of both the predator and the original trapped animal. Where a predator is obviously residing in an area consider moving to another location.

In the southwest for example, an awareness of the presence of kookaburras, currawongs, swamphens and ravens is particularly important.

### 6.5 Multiple catches

Care must be taken when trapping, particularly near roosting sites and watering points, as a multiple trapping event may occur in a short period of time. Check there are no birds on the ground before tending to the actual net. When removing birds from the net, always remove large birds and predatory birds first as their movements can injure smaller birds.

### 6.6 Time animals spend in nets

All nets should be checked and cleared at least every 20min to avoid injury to the birds. Personnel must be constantly based out of sight and near each net to check the nets

frequently and respond to any unforeseen circumstances. Ideally birds should be removed from nets within 10 minutes of capture.

## 6.7 Use of audio lures

The use of audio lures (i.e. any call playback devices) whilst mist netting birds is not a standard technique and it is not acceptable to use audio lures for standard mist netting projects approved by the Department's Animal Ethics Committee. Any project proposing to use audio lures on mist nets must provide adequate justification in an application to the Department's AEC, and should consider all potential welfare impacts. Potential impacts to both target and non-target bird species include:

- Interrupting breeding and migration,
- Causing behavioural changes, such as increasing aggressive territorial behaviour,
- Attracting feral predators to the study site,
- Causing individuals to remain at a study site longer than normal, and
- Causing an influx of individuals that would not normally be found at the study site.

## 6.8 Injury and unexpected deaths

If injury, unexpected deaths or euthanasia occur then it is essential to consider the possible causes and take action to prevent further deaths. For projects approved by the Department's Animal Ethics Committee, adverse events such as injury, unexpected deaths or euthanasia must be reported in writing to the AEC Executive Officer on return to the office (as per 2.2.28 of The Code) by completing an *Adverse Events Form*. Guidance on field euthanasia procedures is described in the Department SOP for *Humane Killing of Animals under Field Conditions*. Where disease may be suspected, refer to the Department SOP for *Managing Disease Risk in Wildlife Management* for further guidance.

## 6.9 Hygiene

All handling bags/equipment should be kept clean and disinfected to minimise risk of disease/contamination etc. after each trapping session. See the Department SOP for *Managing Disease Risk in Wildlife Management*.

## 6.10 Breeding season

It is advised to avoid setting mist nets in areas that may impede safety or social behaviours of birds during breeding season activity. Do not, for example, place netting in close proximity to bird nests as occupants may become stressed and predators may be attracted to the activity associated with trapping in the area.

## 6.11 Weather

Nets should not be opened in extreme weather conditions (wet, windy, cold or high temperature situations) to prevent physiological stress.

# 7 Competencies and Approvals

Department personnel, and other external parties covered by the Department's Animal Ethics Committee, undertaking monitoring projects involving mist nets and other bird



trapping devices require approval from the committee and will need to satisfy the competency requirements detailed in Table 1. This is to ensure that personnel involved have the necessary knowledge and experience to minimise the potential impacts of mist nets and other trapping devices on the welfare of the birds. Other groups, organisations or individuals using this SOP to guide their fauna monitoring activities are encouraged to also meet these competency requirements as well as their basic animal welfare legislative obligations.

It should be noted that details such as intensity of the study being undertaken will determine the level of competency required and Table 1 provides advice for basic monitoring only.

*Table 1 Competency requirements for Animal Handlers of projects using mist nets and other trapping devices to capture birds*

Competency category	Competency requirement	Competency assessment
Wildlife licences	Licence to take fauna for scientific purposes (Reg 17) OR Licence to take fauna for educational or public purposes (Reg 15) OR Licence to capture and mark birds or bats (Reg 23) (with an ABBBS Banding Authority A Class or R Class)	Provide licence number
Formal training	At least one person must have an ABBBS accreditation with a mist net endorsement	Provide ABBBS licence number
<i>Note: Suitable levels of skills/experience can substitute for formal training requirements</i>	Other personnel are encouraged to complete a Department Fauna Management Course or equivalent training	Provide course year
General skills/experience	Relevant knowledge of species biology and ecology	Personnel should be able to correctly identify the species likely to be encountered in mist nets for the site/s being studied. This knowledge may be gained by sufficient field experience, supplemented where necessary by consultation of field guides and other literature  Estimated total time in field: Min 1 year involved in similar projects.
Fauna survey and capture	Training and experience in trap hygiene, disease	Personnel should be familiar with hygiene procedures. This knowledge

Competency category	Competency requirement	Competency assessment
skills/experience	transmission	may be gained by sufficient field experience and/or consultation of literature.  Estimated total time in field: Min 1 year involved in similar projects
Animal handling and processing skills/experience	Training and experience in hand netting and hand capture of birds	Personnel should be confident at hand capture of the range of species likely to be captured. This experience is best obtained under supervision of more experienced personnel.
	Training and experience in bird trapping techniques	
	Experience and training in the use of mist nets for birds	A total of 500 birds of 32 species over 2 years is required for an ABBBS licence
	Experience in handling birds	

## 8 Occupational Health and Safety

Always carry a first aid kit in your vehicle and be aware of your own safety and the safety of others as well as the animals when handling. Wear practical dress attire and footwear, and beware of zips, buttons and jewellery that are likely to become caught in nets and equipment.

A job safety analysis is recommended prior to undertaking any monitoring which involves mist netting. This safety analysis should include the following considerations.

### 8.1 Animal bites, stings and scratches

Care should be taken when handling animals to avoid bites, stings or scratches. All inflicted injuries (even superficial ones) should be appropriately treated as soon as possible to ameliorate possible allergic reaction, prevent infection and promote healing.

Some bird species can deliver painful bites and scratches, such as parrots (e.g. cockatoos, galahs, corellas), which have large, strong beaks and jaws that are capable of inflicting serious injury to handlers. A light towel placed over the bird's head can help to reduce the birds' stress, and therefore reduce the likelihood of it biting. A large calico bag can also be used to restrain a parrot if its head is free of the net, by placing the bag over the hand and grasping the bird's head through the bag. While the head is restrained, the body, wings and legs can then be untangled, withdrawn from the net and then pulled inside the bag.

Protective gloves can be also be used to reduce the chance of injury, however heavy gloves decrease the handler's sensitivity and dexterity and therefore may increase the risk of injury to the bird when handling small species.

To improve safety, field personnel should be aware of the treatment for snakebite and carry appropriate pressure bandages. Personnel should also have up-to-date tetanus vaccinations. Department personnel must not capture bats unless fully vaccinated against Australian Bat Lyssavirus.

If Department personnel or volunteers are injured, please refer to the Department's Health and Safety Section's 'Report a Hazard, near-miss or incident' intranet page, which can be found at [http://intranet/csd/People\\_Services/rm/Pages/ReportingHazards,Near-MissesandIncidents.aspxZoonoses](http://intranet/csd/People_Services/rm/Pages/ReportingHazards,Near-MissesandIncidents.aspxZoonoses).

## 8.2 Zoonoses

There are a number of diseases carried by animals that can be transmitted to humans (i.e. zoonoses such as Toxoplasmosis, Leptospirosis, Salmonella). All personnel must take precautions to minimise the risk of disease transmission to protect themselves, their families and wildlife populations.

Zoonotic risks from birds include Psittacosis (Chlamydiosis), Aspergillosis, Erysipelas, Yeriniosis and Samonellosis. Face masks are recommended to reduce the risk of contracting disease where infected birds are suspected. Other precautionary measures must also be considered whether there is a possibility of catching bats in mist nets.

Advice on minimising disease risk is contained in the Department SOP for *Managing Disease Risk in Wildlife Management*

## 8.3 Allergies

Some personnel may develop allergies when they come in contact with animal materials such as hair and dander. Personnel known to develop allergies should wear gloves when handling animals and long sleeved pants/shirt.

People with severe allergies associated with animals, with immune deficiency diseases or on immunosuppressant therapy should not engage in the handling of wildlife.

# 9 Further Reading

The following SOPs have been mentioned in this advice and it is recommended that they are consulted when proposing to use mist nets and other devices to capture birds.

- Department SOP *Hand Capture of Wildlife*
- Department SOP *Hand Restraint of Wildlife*
- Department SOP *First Aid for Animals*
- Department SOP *Humane Killing of Animals under Field Conditions*
- Department SOP *Managing Disease Risk in Wildlife Management*

For further advice refer also to:

Bub, H. (1991). *Bird Trapping and Bird Banding*. New York, NY: Cornell University Press.

Dietz, N.J., Bergmann, P.J. and Flake, L.D. (1994). A walk-in trap for nesting ducks. *Wildlife Society Bulletin* 22(1): 19-22.

Ralph, C. J. (2005). The Body Grasp Technique: A Rapid Method of Removing Birds from Mist Nets. *North American Bird Bander* 30(2): 65-70.

Spotswood, E. N., Goodman, K. R., Carlisle, J., Cormier, R. L., Humple, D. L., Rousseau, J., Guers, S. L. and Barton, G. G. (2012). How safe is mist netting? Evaluating the risk of injury and mortality to birds. *Methods in Ecology and Evolution* 3: 29-38.

Sutherland, W.J., Newton, I. and Green, R.E. (2004). Chapter 4: Birds in the Hand. In *Bird Ecology and Conservation*. New York, NY: Oxford University Press.

Whitworth, D., Newman, S., Mundkur, T. and Harris, P. (2007). *Wild Birds and Avian Influenza: An Introduction to Applied Field Research and Disease Sampling Techniques*. Rome, Italy: FAO Animal Production and Health, Food and Agriculture Organisation of the United Nations.

## 10 References

Animal Ethics Infolink (2015). *Wildlife Surveys*. Retrieved from:

<http://www.animaethics.org.au/policies-and-guidelines/wildlife-research/wildlife-surveys>

Charles Darwin University Animal Ethics Committee. (2006). *Guidelines for Field Research on Vertebrates*. Casuarina, NT: Charles Darwin University.

Lowe, K.W. (1989). *The Australian Bird Bander's Manual*. Canberra, ACT: Australian Bird and Bat Banding Schemes and Australian National Parks and Wildlife Service.

NHMRC (2004). *Australian code of practice for the care and use of animals for scientific purposes* (7<sup>th</sup> ed.). Canberra, ACT: National Health and Medical Research Council.

Sharp, T. and Saunders, G. (2004). *BIR002 Trapping of Pest Birds*. NSW: Department of Primary Industries. Retrieved from:

<http://www.environment.gov.au/biodiversity/invasive/publications/pubs/bir002-trapping-of-pest-birds.pdf>

Sharp, T., Saunders, G. and Mitchell, B. (2007). *RES001 Live Capture of Pest Animals Used in Research*. NSW: Department of Primary Industries. Retrieved from:

<http://www.environment.gov.au/biodiversity/invasive/publications/threat-abatement-projects/pubs/46217-operating-procedure-1.pdf>

Silvy, N.J. (Ed.) (2012). *The Wildlife Techniques Manual. Research* (Vol. 1)(7<sup>th</sup> ed.). Baltimore, MD: The John Hopkins University Press.

Sutherland, W.J., Newton, I. and Green, R.E. (2004). Chapter 4: Birds in the Hand. In *Bird Ecology and Conservation*. New York, NY: Oxford University Press.

Whitworth, D., Newman, S., Mundkur, T. and Harris, P. (2007). *Wild Birds and Avian Influenza: An Introduction to Applied Field Research and Disease Sampling Techniques*. Rome, Italy: FAO Animal Production and Health, Food and Agriculture Organisation of the United Nations.

The North American Banding Council (2001). *The North American Banders Study Guide*. Retrieved from: <http://nabanding.net/nabanding/>