

SOP NUMBER:	W6 V2
TITLE:	Capture of Wild Birds using Mist Nets
VERSION NUMBER:	V2
PREPARED BY:	Prof. Paul McDonald
REVIEWED BY:	Dr Lori Hurley
AWO REVIEWED DATE:	7 th April 2021 – Dr Justin Bailey
AEC APPROVAL DATE:	30 th April 2021
EFFECTIVE DATE:	30 th April 2021
REVIEW DATE:	30 th April 2024

Purpose

The purpose of this procedure is to capture free-ranging birds using mist nets. Mist-netting is a widely accepted and practiced technique for capturing small to medium sized free-ranging birds (Whitworth, Newman, Mundkur, & Harris, 2007). There are four main reasons why the capture of birds may be required: 1) to observe birds at close range to obtain information that could otherwise not be acquired (e.g. morphometric measure), 2) to detect the presence of cryptic species, 3) to mark or attach tags, bands or transmitters to individuals, and 4) to conduct a scientific procedure or obtain a sample/s (e.g. blood sampling: Glosler, 2004).

Definitions

N/A

Precautions: Work Health and Safety

Training & Competency

The procedure will only be carried out by, or under the direct supervision of, competent investigators licensed (either R or A class) and holding a mist net endorsement as administered by the Australian Bird and Bat Banding Scheme (ABBBS) and required by legislation. Trainees (C class authority holders) must always be under the direct supervision of an R or A class authority holder, and must obtain at least an R class authority before they are permitted to operate independently as legislated and administered by the ABBBS. Project holders (A class banders) are responsible for accessing qualifications of staff involved.

Equipment

A variety of mist nets are available for purchase and use by researchers. The appropriate net weave size should be used, and the length/height of nets determined based on conditions. Before operation nets should be checked for damage and repaired if required. The ABBBS or mist net providers can assist in choice of net, but once operators are qualified as R or A class authority holders they should be well placed to make their own informed choices.

Substances to be administered, if relevant:

Drug name (generic name, not trade name)	Dose rate (mg/kg body weight)	Route IV/IM/SC/PO	Timing of administration and frequency (eg. 90 minutes pre- operative, to induce anaesthesia, during procedure, at specific intervals during the procedures)	Purpose
N/A				

Methods

Capture, restraint and monitoring

Birds will be captured using mist-nets (see procedure outline below). The number of nets setup should be adjusted based on the skill of the operators, distance between them, and number of birds being captured. Researchers must take care not to deploy more nets than they can safely and regularly monitor, and may need to furl some nets in situations following the capture of a large number of birds. The welfare of potentially captured birds and the likely time that they are in nets should be the first priority.

Open mist nets should be monitored regularly, and never left unfurled (open) and unattended for extended periods of times. When using active catching methods (e.g. using an attractor such as call playbacks to attract birds) nets should not be left unattended/unchecked for more than a few minutes at a time. Nets placed passively in the environment must be checked at least once every 20 minutes (Gaunt et al., 1999; Whitworth et al., 2007), however again a higher rate of checking may be required in situations where capture rates are high. Checking of passive nets should also occur more frequently in temperature extremes (< 10°C or > 33°C: Whitworth, Newman, Mundkur, & Harris, 2007) and if there are a large number of potential predators in the area such as currawongs/raptors.

During the extraction and handling of birds from mist nets, individual birds will be in direct view of the researcher(s) and therefore monitored continuously for signs of stress. Birds will only be restrained for the minimum period of time required to safely remove them from nets unless they are to be sampled for another procedure, such as banding or blood sampling.

Procedure

1. Mist nets should be erected following manufacturer's instructions and be set or used so as to minimize (a) the risk of catching non-target species, and (b) any harm caused to a trapped animal (e.g. net set so if bird caught in bottom section it doesn't touch ground, exposing it to ants, etc.).
2. Birds that fly into the net are unable to free themselves from the fine net mesh, and remain entangled in the net until extricated by the investigators/s. The net typically catches on head, wings, and feet. However, when approaching the net every capture needs to be assessed carefully. Particular care needs to be taken if the net is in a bird's mouth, as the netting can loop around the bird's tongue and care is then needed to remove it safely.
3. Captured birds must be extricated from the mist net as soon as possible following capture, to avoid stress or injury to captured individuals. If multiple birds are caught at once, a quick assessment should be made to determine if any should be prioritized for removal first (e.g. if a bird has entangled its tongue in the net – rare occurrence but puts bird at risk of serious injury).
4. To extricate a captured bird:
 - a. Assess what side the bird went into the net. This can usually be done before touching bird, but if it is fairly entangled proceed to (b) and immobilise bird. Look for which side you can see the vent area clearly (with out netting overlapping it).
 - b. Use one hand to gently immobilise the individual, especially its wings and feet, to prevent further struggling and entanglement in the net. If it is noted that the tongue is caught, restrain the bird so to stop the net from pulling at this vulnerable area.
 - c. In most cases, it will help to untangle the feet first and immobilize them before proceeding to free the rest of the body from the net (Whitworth et al., 2007). Typically, if the feet are freed, then the wings can be released followed by the head. However, the easiest way to remove a given individual should always be used, and less experienced operators should consult with more experienced colleagues if in doubt.

- d. If tongue is caught in net it is best to address this as soon as possible once there is sufficient freedom in the relevant netting. Use of tweezers or a small stick to hook the net can often be useful in this scenario.
5. Scissors or a seam ripper may be used to cut away strands of the net in the case of a bird becoming severely entangled and unable to be removed by conventional means in a timely manner, or if the individual is exhibiting signs of extreme stress (heavy feather loss, panting, closed eyes, drooped head). When doing so it is best to target single strands, then reassess if it can then be removed normally before cutting the net further.
6. Non-target species captured in mist nets must be immediately released at the point of capture, but always ensure prior to releasing any individual that there is a clear flight path away from nets to avoid immediate recapture, and also that there are no potential predators nearby (kookaburras, corvids, raptors).
7. Procedural success will be determined when the captured bird has been extricated from the mist net, and the animal is either ready for release or the next procedure. Birds awaiting another procedure must be kept in clean cotton bird bags to avoid stress. Other relevant holding devices may be required depending on the next procedure, but alternatives should be justified in AEC authority requests. Bags should be hung up inside a vehicle or on a tree in a secure location off of the ground to avoid trampling, suffocation, falls, chilling or overheating. Bags should be kept out of rain, wind, and direct sun on warm days, but during cold periods placing in sunlight may be needed. Holding time should be as short as possible, maximum times will vary with species (with very small and very large birds being less tolerant).

Any other protective measures to safeguard the animal's wellbeing

Nothing further beyond above.

Care of the animal after the procedure

Contingency plan for injured or sick birds

If a bird becomes sick or injured:

- The injury will be diagnosed- if an injury does not impair the walking or flight of the bird it will be immediately released and monitored.
- If flight or walking is likely to be impaired the bird will be placed in a dark box or cloth bag and transported to the nearest veterinarian or animal hospital.

Otherwise bird should be checked for any injury and released as described as soon as possible after all required samples have been collected.

Animal Welfare Considerations

Capture of birds using mist nets is the most widely accepted and practiced technique used for capturing small to medium sized birds. Previous studies suggest that animal welfare risks associated with this procedure are very rarely encountered. The potential risks to animal welfare associated with this procedure are listed below, along with details on how these risks will be minimized

- 1) Animal injury or stress associated with capture, entanglement in the net, and/or handling
 - a. The procedure will only be carried out by, or under the direct supervision of, competent investigators licensed by the ABBBS and holding a mist net endorsement as required by legislation. Strands of the net can be cut in the case of a bird becoming severely entangled. Birds will be monitored continuously throughout the procedure for signs of major stress (lethargy, heavily laboured or slowed breathing, loss of motor control, loss of consciousness).
- 2) Capture of non-target species

a. Knowledge of the daily movements and activity patterns of target species (i.e. identifying regular nesting sites, feeding sites, roosting sites, and flight paths) will help to improve capture success and reduce the unintended capture of non-target species (Whitworth et al., 2007). Non-target species captured in mist nets must be immediately extricated and released near the point of capture.

3) Exposure to adverse weather and predators

a. Where possible, mist-nets should be shaded or positioned to avoid full exposure to the sun. Netting should be avoided if the ambient temperature is below 0°C or above 35°C (Gaunt et al., 1999). Mist netting must not be carried out in rainy conditions, as there is a risk that captured birds may develop hypothermia, especially in cold environments (Whitworth et al., 2007). Windy and gusty conditions must be avoided where possible, as birds captured within a billowing net may sustain muscular strains. Mist nets can also become more visible to birds in windy conditions, reducing capture rates. Investigators must also remain alert and keep watch for avian and terrestrial predators that may be drawn to birds captured in mist nets. Nets must be positioned so that captured birds are well above any surface water, so the risk of drowning is eliminated.

b. Care should be taken when releasing birds to make sure there are no predators nearby (either aerial or ground).

Pain Relief Measures:

Limited handling times should reduce stress on the bird. The birds will be monitored throughout the process to ensure no injury or illness is occurring while in care. If injury or illness does occur, the birds will be handled as described above. No pain relief measures should be necessary in normal mist-netting procedures.

Appendices
N/A

Linked SOPs
N/A

References

Gaunt, A. S., Oring, L. W., Able, K. P., Anderson, D. W., Baptista, L. F., Barlow, J. C., & Wingfield, J. C. (1999). *Guidelines to the use of wild birds in research*. Retrieved from Washington D. C.

Glosler, A. (2004). Birds in the hand. In W. J. Sutherland, I. Newton, & R. Green (Eds.), *Bird ecology and conservation: A handbook of techniques*. Oxford U.K.: Oxford University Press.

Whitworth, D., Newman, S., Mundkur, T., & Harris, P. (2007). *Wild birds and avian influenza: an introduction to applied field research and disease sampling techniques*. (5). Retrieved from Rome.

Document Control & Record of Revisions			
<i>Summarise revisions from previous versions</i>			
Version Number	Description of Revision/Amendment	Approved by	Revision Date/Date effective
V2	Three yearly review and updated onto new SOP template	Animal Ethics Committee	30 th April 2021

