

Chapter 3

Wild bird capture techniques

For millennia, humans have relied on wild birds as a source of food, clothing, and social and religious manifestations of culture, art and sport. While their mobility, wariness of humans and diverse habitats often make live capture of wild birds a challenge, a multitude of trapping techniques and devices have been developed over the centuries. Most of the live capture techniques utilise bait, decoys, recorded calls or lures to attract birds to trapping sites, but a few active techniques in which the trapper actually pursues the bird have been developed and may be useful in some situations. Thus, there are few, if any, bird species which cannot be captured.

Capture techniques specifically designed for wild birds such as waterfowl, shorebirds and other wetland species are of primary interest because current knowledge indicates these are the species that serve as the primary reservoirs of low pathogenic AI viruses. However, practical techniques for capturing passerines, raptors and other bird groups vulnerable to the virus are also important. Extensive reviews of capture techniques for a wide range of bird groups can be found in Bub (1991), McClure (1984) and Schemnitz (2005).

The health and well-being of the birds should be the primary concern during all phases of capture. The following principles should be adhered to ensure birds are captured correctly, safely and with minimum disturbance:

- Wild bird capture is an activity that is strictly controlled in most countries; those engaged in capture activities should always be aware of and comply with local and national laws regarding these activities and obtain all the required local, state, provincial and federal permits well in advance.
- Capture techniques and equipment which expose birds to foreseeable risk of injury should be avoided at all costs.
- Those conducting capture efforts should take all necessary precautions to avoid disturbing nesting birds at breeding sites or enhancing vulnerability to nest site predation following human intrusion.
- Monitor weather forecasts prior to conducting capture efforts to ensure birds are not captured during extreme climatic conditions when they may be at increased risk of hypothermia or hyperthermia.
- Always have a sufficient number of experienced personnel (at least four) available before undertaking any capture operation.
- Check operative traps and nets at appropriate time intervals; birds should not remain in traps or nets any longer than is necessary. This is capture technique and weather dependent, and could be as short as every 15 minutes to twice a day.
- Close or dismantle traps and nets that are inoperative and not checked regularly.

CORRAL TRAPS (ROUND-UPS)

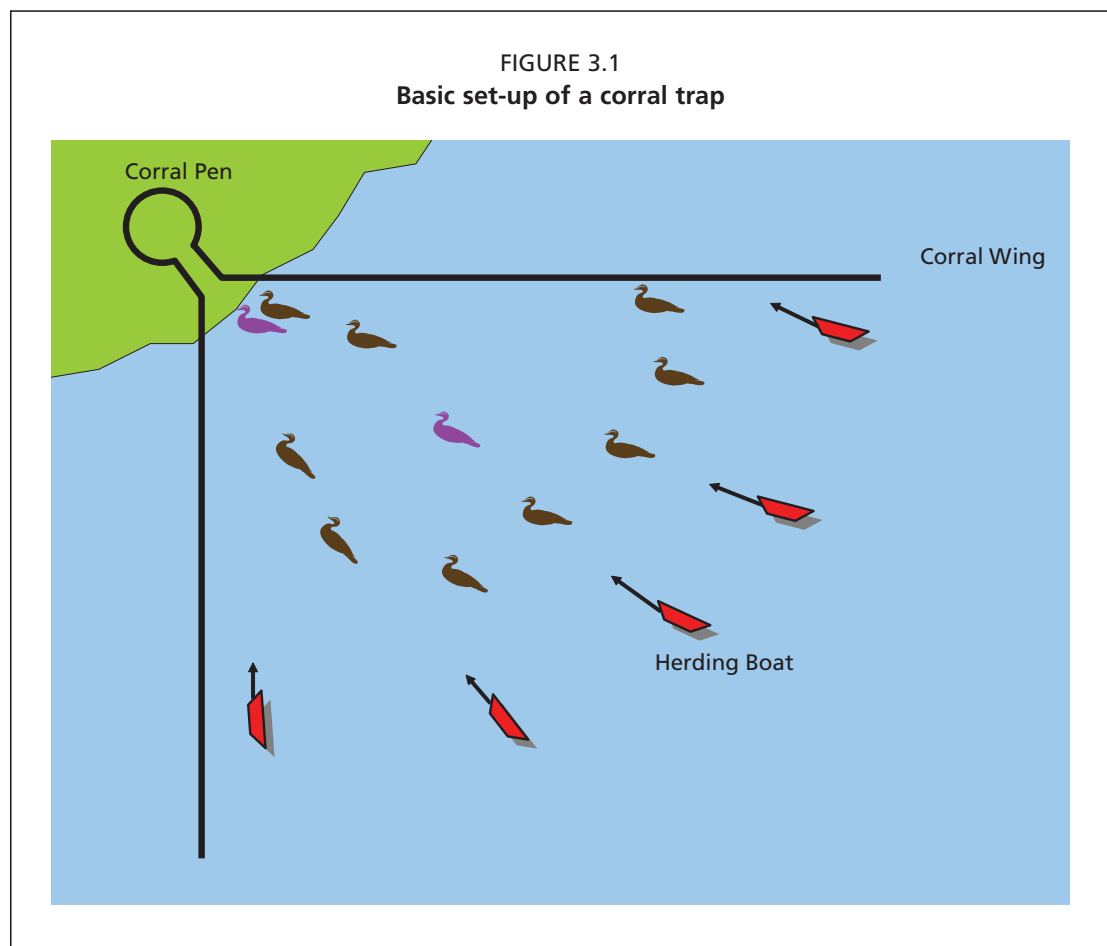
The two- to three-week period after breeding when waterfowl, grebes and coots simultaneously moult all their flight feathers is an opportune time for capturing these species. During this flightless period, birds can often be “rounded up” by herding or driving them between barriers which funnel the birds into capture pens constructed near the moulting grounds.

The basic drive trap design used by the Wildfowl & Wetlands Trust (WWT) consists of a capture pen or “corral” with two long barriers or “wings” extending some distance from the mouth of the corral (Figure 3.1). Birds may be on the water or on land when they are initially driven between the corral wings by the capture team, but if the wings extend out into the water they should eventually funnel the birds into a corral constructed on flat dry ground.

Corral trap construction

Specific features of the trap will depend on the size of the species to be captured. In the following instructions, a range of specifications for the corral pen(s) and wings are given both for smaller birds (ducks, grebes and coots) and larger waterfowl (geese and swans).

- The corral pen and wings should be marked out with 1.5-2.0 m wooden posts or metal fence stakes firmly driven into the ground and spaced approximately 1 m apart; a round corral is usually best, but the shape may differ if conditions warrant.



- The diameter of the corral is dependent on the number of birds to be caught and may vary from less than 2 m up to 30 m, or more (Figure 3.2).
- Side pens may also be constructed to ensure that no single pen contains too many individual birds; this is particularly important for the welfare of birds during the capture process.
- The corral wings should be erected in straight lines over flat ground or water and should not snag on branches, brambles or other vegetation because this may damage the net and cause birds to become entangled.
- The width of the wings at the entrance to the corral can be as narrow as 0.5-1.0 m for small numbers of ducks or up to 50 m when capturing large numbers of geese or swans.
- Attach black nylon netting or other appropriate material to the corral and wing posts; use a material that will not injure birds when they run up against the corral pen or wing walls.
- The nylon netting (or other wall material) should be stapled at the top, middle and bottom of wooden posts; metal stakes can be run through the top, middle and bottom of the netting.
- When attaching the netting to the posts make sure the net is taut and the bottom 0.1 m of the net curves toward the inside of the corral to prevent birds escaping beneath the net during the 'drive'.
- The height of the corral should be 1.0 m for ducks and 1.5-2.0 m for geese and swans, but corral wings can be 1.0 m high for all three groups.

FIGURE 3.2
Corral trap pen



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- Hessian (or any other fabric) should be tied to the bottom 0.5 -1.0 m of the corral to prevent birds catching their claws on the netting.
- If the ground is wet or cold, clean straw should be spread on the ground in the corral to a depth of 3-15 cm.

It should be noted that the details of corral construction described above apply to instances when the trap can be erected before the attempted drive. In some cases (e.g. on the tundra), it will often be impossible to predict where the final capture will occur and the corral will need to be constructed after the birds have been herded and surrounded. In such instances, less precise corral specifications are acceptable, from both a bird welfare and an effectiveness perspective.

Herding birds into a corral trap

Depending on the location of the capture efforts, birds can be driven between the corral wings and 'funnelled' into the corral either by rowing in small boats, wading through shallow water or walking behind them. General instructions for 'herding' birds into the corral are described below:

- The number of "herders" required will depend on the number of birds to be caught, the size of the corral enclosure and habitat. A minimum of four herders will be required.
- The herders should form a line with the birds between themselves and the funnel shaped corral opening (Figure 3.3); in cases where the final capture site is uncertain, the herders should form a circle and drive birds towards a central point, then construct the corral near the herded birds and move them into it.

FIGURE 3.3
Technique for herding flightless waterfowl



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- Using coordinated movements, the herders should then drive the birds as a group toward the corral opening (or central point).
- Birds should be herded at a steady pace so that they do not panic and scatter in all directions or charge at speed into the corral causing the walls of the pen to collapse.
- Hand nets or poles can be used to direct the birds' movements and catch any birds which try to escape through the line (although it is better to let a single bird escape rather than break the line and risk losing the entire flock); waving a hand-net will persuade a bird to move away, while pointing the net to the right or to the left, may persuade birds to move in the desired direction.
- Once all birds have entered the corral, the mouth of the corral should be carefully closed (making sure no birds are caught in the door) and the designated bird extractor should position him/herself inside the pen and in front of the exit.

BAITED TRAPS

Drive traps for waterfowl can only be used near moulting areas when birds undergo their annual wing moult, so other capture techniques must be employed outside the flightless moulting period. Baited traps are an effective technique for capturing a wide array of wild birds, including waterfowl and many ground-feeding terrestrial species. However, because hunting often occurs where waterfowl and other game birds aggregate, it is advisable to locate bait traps within "sanctuaries" (when practical) to avoid attracting birds to areas where high levels of lead shot may be ingested.

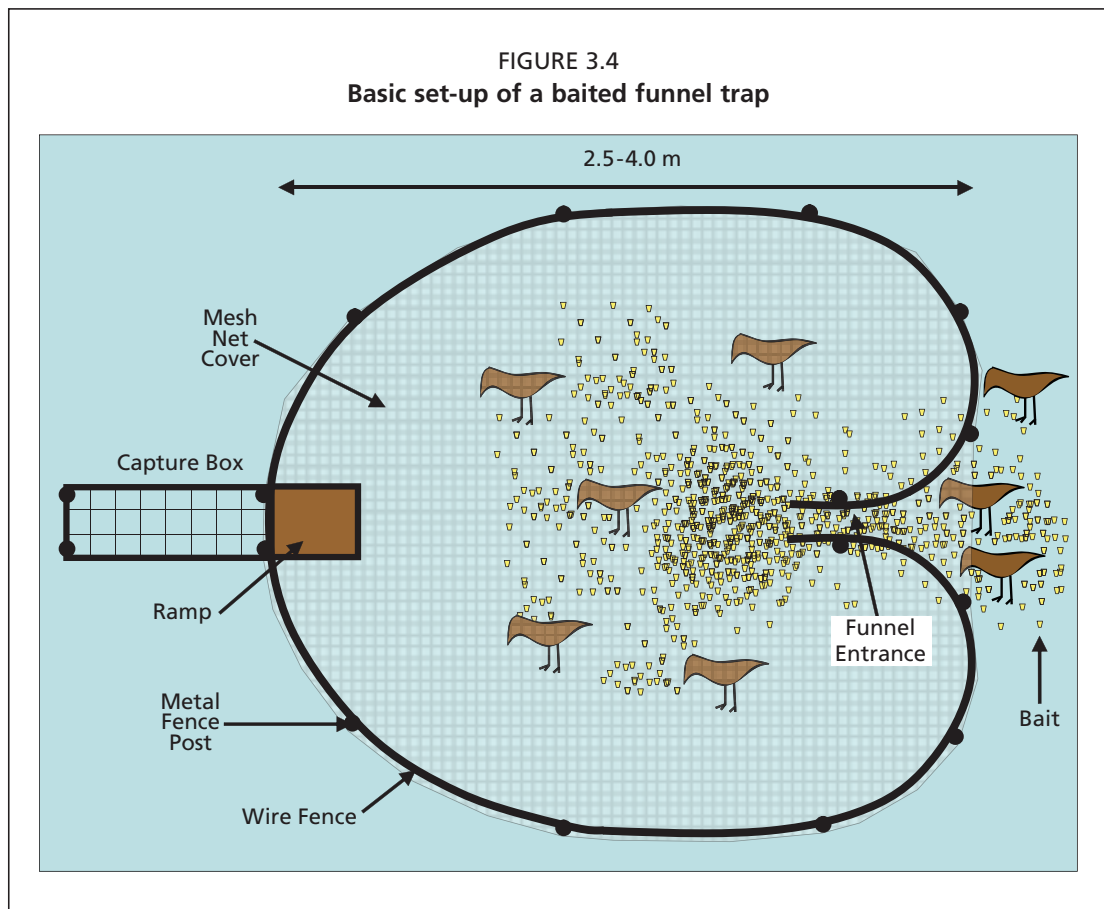
Many of the baited trap designs utilise self-contained wire cages or enclosures supported by posts that are baited with appropriate food stuffs for the target species. For most waterfowl, typical baits include wheat, corn kernels, whole rice or other grains. These traps may go by several different names (e.g., cloverleaf traps, drift traps), but two designs particularly useful for waterfowl are baited funnel traps and baited dive-in traps.

Funnel trap

A baited funnel trap can be deployed or constructed on land or in water shallow enough for foraging by dabbling ducks, coots and waders, usually <25-30 cm, although the design will function in deeper water provided those handling the birds can reach the trap site in waders or a boat. The basic funnel trap design consists of a wire cage or enclosure with one or more funnel shaped entrances which the birds can enter, but have difficulty exiting (Figure 3.4). Fine mesh netting can be placed over enclosure traps to prevent birds escaping over the wire fence when handlers approach.

Funnel trap construction

- An appropriate trapping site should be selected (preferably a site already frequented by the target species) and bait type (catered for the targeted species) spread over the site for several days before the trap is constructed.
- The funnel trap enclosure should be marked out with 1.5-2.0 m posts firmly driven into the ground or shallow wetland substrate; many different trap sizes and shapes with one to many entrances have been designed (Figures 3.5, 3.6 and 3.7).



- The size of the enclosure or trap should be appropriate for the number and size of the target species.
- The funnel entrance(s) should be just wide enough to allow birds to pass through the opening, or push through the opening if the material is slightly flexible; the larger the entrance the greater the likelihood of birds escaping.
- Put the wire enclosure fencing around the post border; use fencing with a lattice pattern that will not allow birds to get stuck while trying to escape.
- Attach the wire fencing to the posts with plastic or soft wire ties, making sure the fence extends all the way down to the ground or substrate; cut and adjust the tie ends so they cannot cut or scratch birds.
- If possible, attach the wire fence to the posts prior to placement at the site as this may facilitate construction of the trap; for some smaller diameter traps, posts may not be necessary at all.
- The nylon netting (or other cover material) should be attached with ties to the top of the wire fencing; if needed a wooden "tent" pole can be placed in the middle of the enclosure to hold up the net cover.
- Create a doorway in the enclosure at the opposite end of the trap from the funnel entrance that allows birds to enter a capture box or net for easy removal from the trap.
- Bait heavily inside the trap but lightly around the funnel entrance to entice birds into the enclosure.

FIGURE 3.5
Wire funnel enclosure for waterfowl in a shallow marsh



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FIGURE 3.6
Wire funnel trap for waterfowl in a shallow lake



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The funnel trap entrance(s) can be easily closed by removing the ties from the posts and securely joining the ends of the wire fence together. In general, traps should be baited and opened in the late evening, checked first thing in the morning, and left wide open (so birds can become accustomed to entering and exiting the trap) for the rest of the day. When checking larger traps, one handler should enter the enclosure through the funnel entrance

FIGURE 3.7
Self-contained wire funnel trap for shorebirds



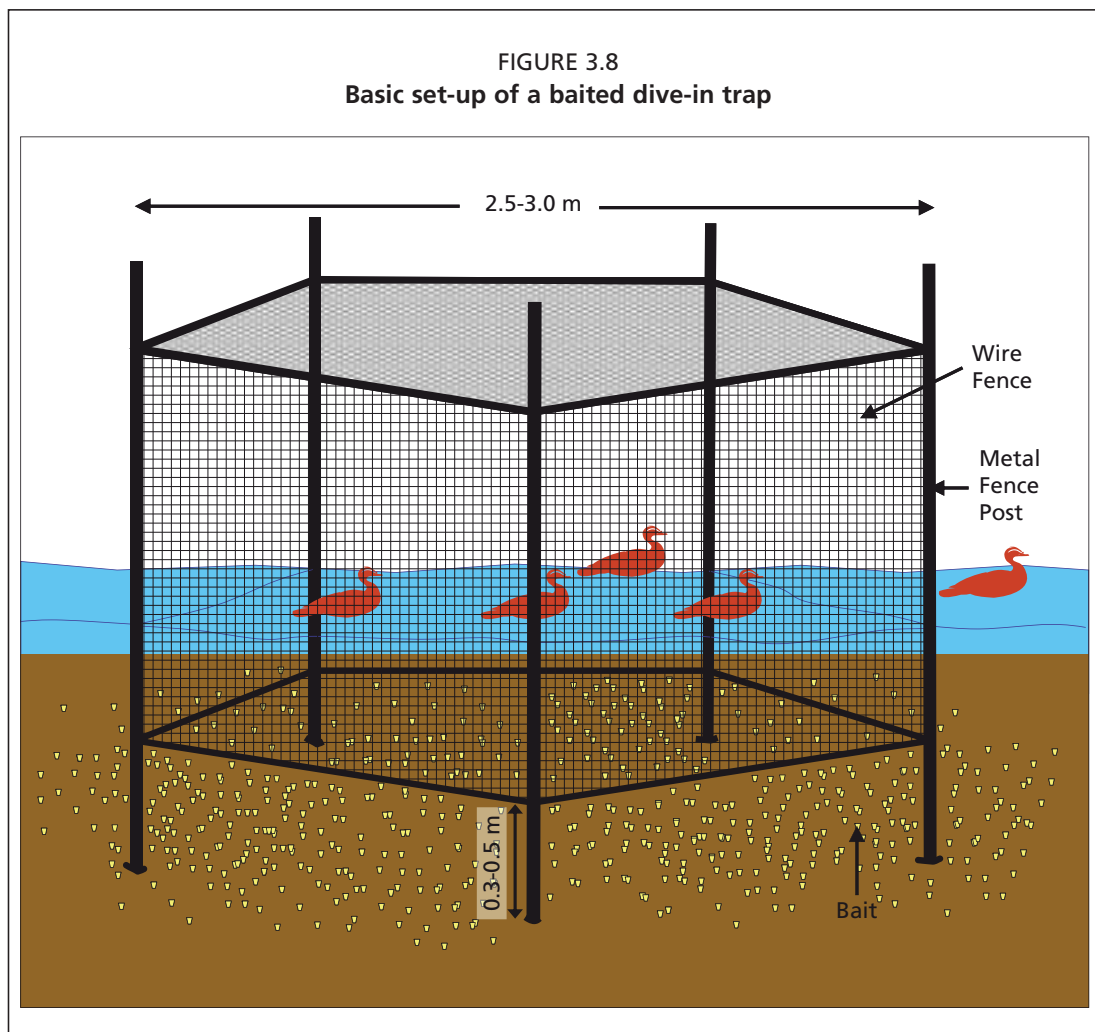
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and drive birds through the open doorway into a holding box or net. In smaller traps, birds can be removed by a handler outside the enclosure with a hand-held keep net. Birds can be removed individually and processed at the capture site or transferred to a travel container and transported to a nearby processing site.

Dive-in traps

As the name implies, baited dive-in traps are effective for capturing aquatic diving birds, primarily diving ducks. Dive-in traps can be constructed in relatively shallow water (<1.25 m) habitats that are frequented by diving birds and accessible to handlers in small boats or wearing chest waders. The basic dive-in trap design is similar to the funnel trap enclosure; however, in the case of dive-in traps, the wire fence is raised (0.3-0.5 m) slightly off the wetland bottom allowing the birds to dive under and into the enclosure (Figure 3.8).

Dive-in traps are only effective in wetland habitats, but may be used in permanent water bodies of adequate depth or tidally influenced wetlands. Some familiarity with tide levels will be necessary when deploying traps in tidal wetlands. Dive-in traps may be constructed during low tides when the trap site may be completely exposed, but will need to be checked whenever the tide rises to inundate the site and birds move in to feed. Because diving ducks have some difficulty taking off directly from the water, fine mesh netting placed over traps may not be necessary. If netting is used to cover the trap, it should be removed from unattended traps to avoid drowning birds at high tides.



Dive-in trap construction

Many of the issues involved in the construction of dive-in traps are similar to those for funnel traps:

- An appropriate trapping site should be selected (preferably a site already visited by the target species) and bait spread over the site for several days before the trap is constructed.
- The dive-in trap enclosure should be marked out with 1.5-2.0 m posts firmly driven into wetland substrate; circular dive-in traps are most common (Figure 3.9), but other shapes may be optimal in certain circumstances.
- As for funnel traps, the diameter of the enclosure should be appropriate for the number and size of the target species to be captured.
- Put the wire fencing in place around the fence post border; be sure to use wire fencing with a lattice size that will not allow birds to get stuck while trying to escape.
- Attach the wire fencing to the posts with plastic or soft wire ties, raising the fence approximately 0.3-0.5 m off the substrate all the way around the enclosure; cut and adjust the tie ends so they cannot cut or scratch birds.
- If possible, attach the wire fence to the posts prior to placement at the site as this may facilitate construction of the trap.

FIGURE 3.9
Dive-in trap set up in a tidal wetland



- Nylon netting (or other cover material) may or may not be needed to prevent birds escaping over the top of the enclosure; if netting is needed it should be attached with ties to the top of the wire fencing and supported in the middle with a “tent” pole.
- Bait heavily inside the trap but lightly around the funnel entrance to entice birds into the enclosure.

Dive-in traps are generally baited in the late evening and checked first thing in the morning, although tidal fluctuations will affect schedules for traps in tidal zones. Birds should be removed by reaching over the enclosure fence with a hand-held net and dipping the birds out of the trap. Holding boxes floated on buoys can be used to transport birds to the shoreline.

CANNON NETS

Birds that congregate in large numbers at roosting or feeding sites can be captured with large mesh nets attached to projectiles that are propelled over the roosting or feeding flocks by explosive charges (Figure 3.10). However, as might be expected with high velocity projectiles launched near dense bird congregations, there is a significant risk of injury or mortality to wild birds and humans if this technique is used by inexperienced operators. Because cannon-netting requires a high level of technical expertise, it should not be attempted without assistance from experienced personnel. Details of cannon-netting procedures are best obtained from experienced practitioners and specific training manuals (e.g. Appleton, undated), however, some general guidelines in the use and application of the technique are provided.

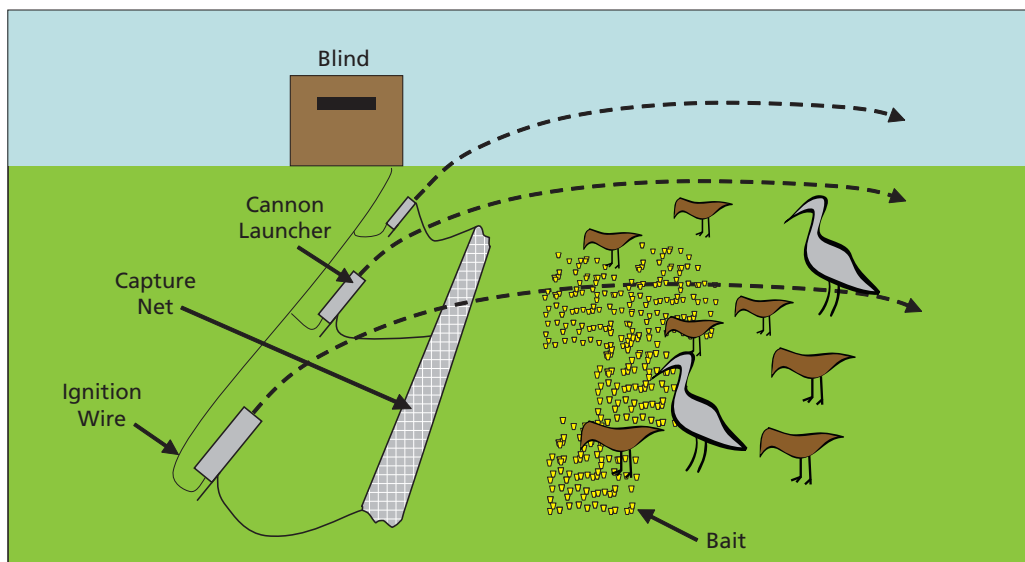
Cannon nets have been used to capture many species of waterfowl, wading birds such as herons and egrets, upland game birds, gulls and shorebirds. Some scouting is usually

FIGURE 3.10
 Launching the cannon-net



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FIGURE 3.11
 Basic set-up at a cannon-netting site



necessary to identify suitable capture sites where predictable roosting or feeding flocks congregate in open and dry upland or very shallow (a few centimetres deep at most) wetland habitats. Bait and decoys can also be used to attract waterfowl and other target species to suitable capture sites.

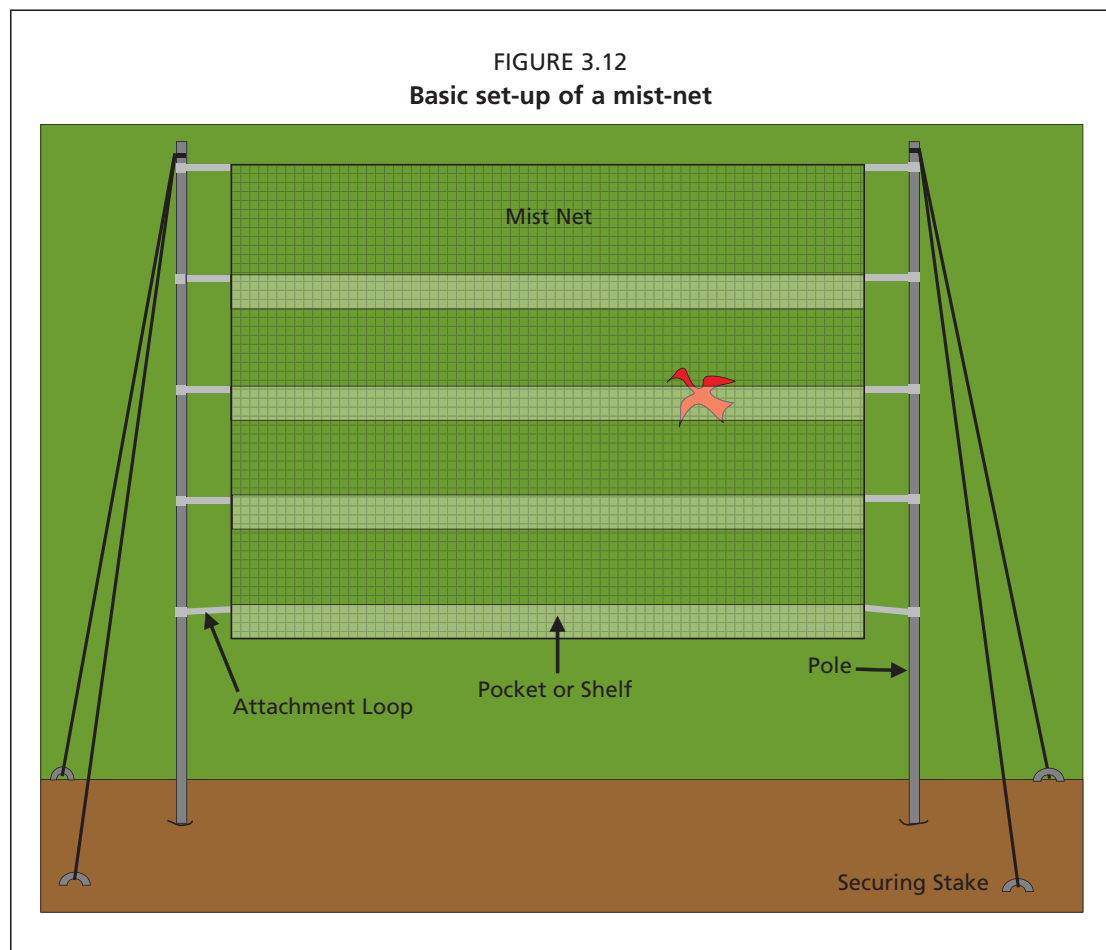
The cannon net setup (Figure 3.11) is usually prepared and the capture team in place (out of view in a blind near the capture site) well in advance of the expected arrival of the birds; if birds are to be lured to capture areas with bait or decoys, the site should be prepared several days to a week before the capture effort. Specially designed boxes or platforms for storing, transporting and launching pre-folded nets can greatly facilitate preparation of the cannon netting site.

MIST-NETTING

Mist-netting is perhaps the most versatile and widely used method for catching small to medium-sized wild birds such as passerines and shorebirds. The basic principle of mist-netting is simple; an inconspicuous mesh net is erected vertically on poles and deployed in areas of high activity to intercept birds as they go about their normal daily routines (Figure 3.12).

Mist nets and mounting systems

Mist nets are available in many different measures, materials, mesh sizes, colours and strand thickness. Dark-coloured nylon nets are most commonly used, but the optimal features for a mist net will depend on the target species and habitat characteristics at the netting site. Lighter coloured nets may be available from some vendors and should be considered if they better blend into the habitat at the netting site. Short nets are more practical in heavy cover, while longer nets can be used in more open habitats. Optimal mesh size is directly



related to the size of the target species; smaller mesh for smaller species and larger mesh for larger species. Nets with finer strands are less visible but more fragile than nets with coarser strands, although the more durable coarse nets may be adequate for species netted at night or in other low light conditions.

When properly positioned, mist nets are inconspicuous even to the birds' keen vision, and unsuspecting birds may strike the net at considerable speed. However, the mist net is designed to "give" and gently decelerate the bird when it impacts the net. Almost all mist nets have a series of 3-4 shelves or pockets running horizontally along the length of the net into which the bird drops when it strikes the net.

The mounting poles are another important part of the mist net package and should be chosen carefully. Poles should be light-weight, portable, strong and drably coloured to blend in with the habitat at the netting site. The pole surface should be smooth enough to allow the net attachment loops to slide cleanly on and off the pole. Sectioned poles are convenient for storage and transport.

Mist-netting sites

Choice of an appropriate mist-netting site is vital for capture success. Obviously, mist net sites should be located in areas the target species are known to frequent, preferably in large numbers. Thus, some knowledge of the target species' daily movements and activity patterns is essential before deploying nets. Identifying the target species' nesting areas, feeding areas, roosting sites and the preferred flight paths between them is an important step in ensuring capture success.

Fine mesh mist nets are relatively inconspicuous when deployed, but choice of a netting site that helps conceal the net is advisable. 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. Shaded sites are always preferable to sunlit areas. A clearing in a vegetated area with a dark but variegated background is an optimal netting site.

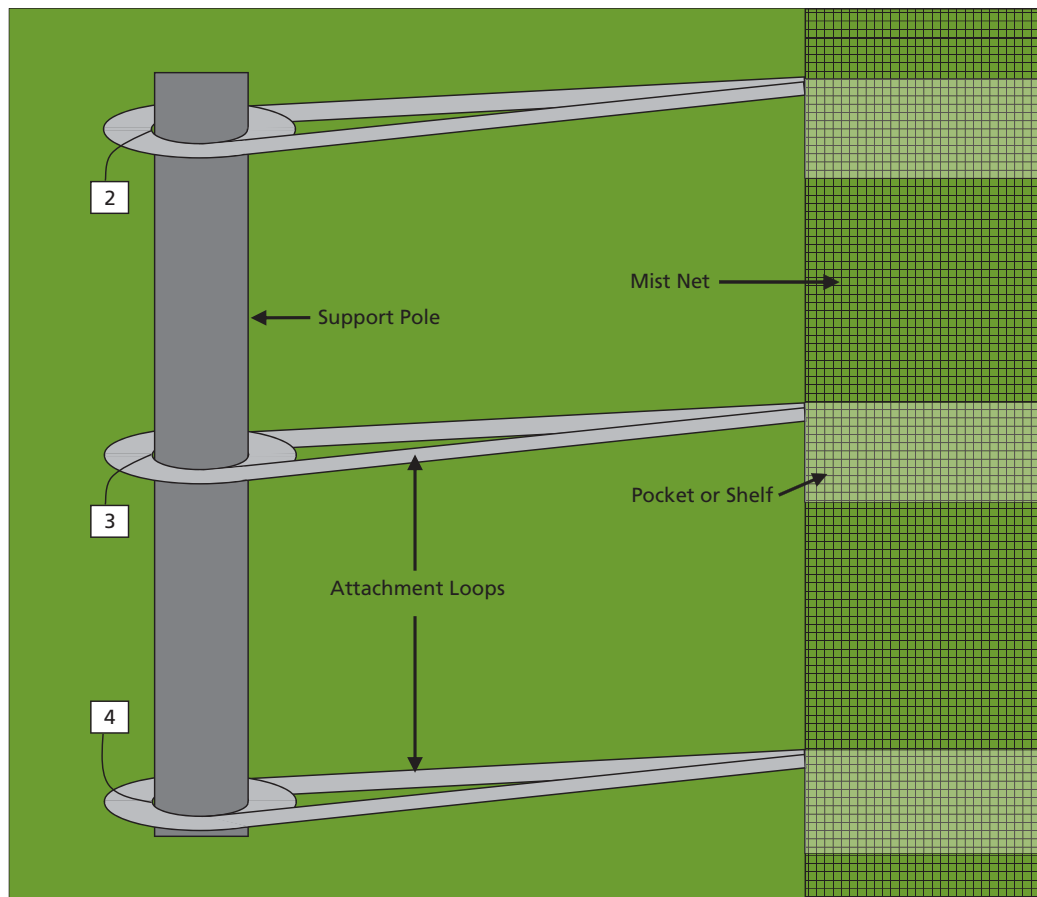
Many species are most active at dawn and dusk, so these are prime mist-netting periods. Fortunately, the weak early morning and late evening light comes from oblique angles and throws long shadows that help to conceal mist nets. Great care is needed when setting nets for waterbirds, which may be present in large numbers, because the potential for a large catch exists. It is essential that the number of nets be limited to that which the field crew can effectively deal with should a large number of birds be caught.

Erecting mist nets

Having chosen a suitable mist-netting site, the net is erected as follows:

- Find the pole attachment loops at one end of the net and number them from top to bottom; be sure to keep the mist net taut and off the ground to avoid catching on rocks and vegetation.
- Form a loop within each pole attachment loop and slide them all in order over one of the poles (Figure 3.13).
- Push the pointed end of the support pole into the ground; do not pound with a mallet because this will damage the pole.

FIGURE 3.13
**Correct method of placing the
 mist net loops on the support pole**



Tags 2-4 indicate numbering of pole attachments loops

- Take the second pole and repeat the first two steps with the other end of the mist net.
- Pull the net taut and push the second pole into the ground.
- Use a mallet to drive the four securing stakes into the ground then tie off each of the securing lines so the mist net is held firmly in place; securing lines can be tied to fixed objects (e.g., rocks or bushes) if the ground is rocky and stakes cannot be used.
- The erect mist net should be taut enough that the net does not sag excessively when birds are in the net (this is particularly important when trapping over dense vegetation and water), but not so taut that birds bounce out when they strike the net.
- 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.
- The tautness of the mist net can be controlled by adjusting tension on the securing lines.
- Clear away any twigs or branches that might catch in the fine mesh and interfere with net function.

The simplicity and versatility of the basic mist net design has allowed modifications for capturing an endless variety of birds. Some of the more novel designs include mist nets deployed on pulley systems and suspended high in the forest canopy, floating nets mounted on tethered buoys or boats, and submerged nets strung across narrow channels. Deploying multiple nets in formation (e.g., "L" or "V" shaped arrays) may increase capture rates.

Using mist nets

- Remain silent and concealed when monitoring mist nets.
- Approach nets quietly to avoid panicking captured birds which are likely to become seriously entangled while struggling to escape.
- An open mist net should never be left unattended for more than a few minutes, under normal conditions 15-20 minutes maximum; if nets cannot be checked frequently close them by sliding the loops together, furling the net and securing it with twist ties.
- Never use mist nets in the rain. Birds netted in rainy conditions are vulnerable to hypothermia.
- Mist-netting in windy conditions is problematic because the net becomes more visible as it blows in the wind; wind also allows birds striking the net to avoid capture as the pocket does not form properly in the billowing net and may also cause injuries (e.g. muscle strains) to captured birds.
- Keep an eye out for avian and terrestrial predators which may be attracted to mist net sites by distressed or struggling birds.
- Maintain mist nets in good condition and properly dispose of used and damaged nets; old nets should preferably be incinerated.
- Recorded calls and decoys have been used to attract birds to netting sites.

Extracting birds from a mist net

Extracting entangled birds from a mist net (Figure 3.14) can be a challenge; however, with patience and experience, even seemingly inextricable birds can be removed without injury or resorting to cutting the mist net. Each entangled bird may pose a different set of problems, but the following guidelines will usually facilitate quicker removal:

- Regularly monitor mist nets and try to remove a bird as soon as possible after it hits the net; the more time the bird spends struggling to escape, the more tangled it will become.
- Determine from which side the bird entered the net; this is accomplished by finding the bird's bare belly.
- Immediately immobilise the bird, especially the wings and feet, to prevent struggling while extracting the bird from the net; this is done by wrapping your index and middle finger around either side of the bird's neck while cradling the body with the palm of your hand and other fingers (i.e. small passerines), taking care not to squeeze the bird too tightly. Large birds may take two people.
- In almost all cases, the feet should be untangled first then immobilised to prevent the bird becoming entangled again; always hold the bird by the upper leg (tibia) and never by the lower part of the leg (tarsus).

FIGURE 3.14
Reed Warbler (*Acrocephalus scirpaceus*) captured in the pocket of a mist net



CREDIT: PIETER VAN EIJK

- Lift the bird out of the pocket and gently pull it away from the net; often the net will simply fall away, but if not inspect the bird to determine how best to proceed.
- In most cases, it is easier to free the tail and one wing, then re-examine the situation to determine if the head or other wing should be freed next.
- If it is clear a bird is hopelessly entangled, do not hesitate to begin cutting individual strands of the net to free it; usually cutting one well chosen strand is enough to free a bird.
- In the worst cases, the net wraps tightly around the bird's closed wing or tongue; in such instances it is best to request assistance from experienced handlers and snip individual strands until the bird is released.
- Take care to avoid the bird pecking or scratching you with its claws while you extract it from the net. Some birds like parakeets (*Psittacula spp*), shrikes (*Lanius spp*), herons (*Ardea spp*), falcons (*Falco spp*) and hawks (*Accipiter spp*) need to be handled with special care as they will often try to peck or scratch.

MISCELLANEOUS CAPTURE METHODS

In the following section, we briefly describe capture methods which have proven useful for bird groups that may be difficult or impossible to capture with the above techniques. In general, these miscellaneous capture techniques have much lower capture rates (number of birds captured per unit time) than the previously described methods; in fact, in most cases the technique is used to trap individual birds rather than large groups. However, these capture methods may be the only effective means of conducting active disease surveillance for

some species known to contract AI viruses. More detailed descriptions of these techniques can be found in the references cited at the end of this chapter.

Raptors require special capture and trapping techniques specifically designed for these species. **Bal-chatri traps** consist of small wire cages of various sizes and shapes containing live bait (a rodent or small bird) and covered with numerous small nooses or slip knots tied from fine fishing line. Raptors attacking the enclosed prey are ensnared when the feet contact the nooses.

Bal-chatri traps are portable and can be quickly deployed when raptors are sighted in the vicinity, but must be weighted or tethered to prevent larger birds from flying off with the trap. The size and shape of the wire cage and strength of fishing line employed depend on the size of the raptor targeted. Nooses should be tied in 3-5 cm loops. Do not hesitate to cut nooses when extracting raptors from bal-chatri traps because the nooses can be easily repaired or replaced.

Several variations of the bal-chatri trap that utilise **noose carpets** have been developed, including: 1) a noose carpet tethered on top of an owl decoy to capture those passerine and raptor species that mob intruding owls; 2) noose carpets placed on baited feeding stations to capture ground-feeding species; 3) noose carpets placed near the entrance of a nest.

Dho-gaza nets exploit the tendency of raptors and many other species to mob intruding owls. A fine mesh net suspended above an owl decoy is effective for capturing these species as they dive on the perceived threat. The net should be tautly suspended above the decoy, but very lightly held in place at the four corners with clothes pins or similar sensitive triggers that release when the attacking bird strikes, allowing the net to envelop the attacking bird.

A dho-gaza net is most effective when placed near a raptor nest where it can be suspended from poles or surrounding vegetation. Decoys should be rendered as realistic as possible (mounted specimens are optimal) by tethering them in a manner (e.g. mounted on a spring) that allows some movement. If plastic decoys are used, attaching a few feathers may help attract the target birds' attention.

Numerous variations of the basic **drop trap** have been developed. The simplest models use bait or other lures to attract birds to an area where a manual or automatic trigger drops a cage, door or net. As with other baited traps, trapping areas should be baited for several days (at least) before traps are deployed and set. The variety of species that can be captured with drop traps is limited only by the ingenuity and patience of the trapper.

Night-lighting techniques utilise bright lights to attract or disorient nocturnally active species which can be captured passively in fixed nets or actively pursued with hand-held nets. A variety of aquatic species including waterfowl, alcids, shearwaters and cormorants have been captured by night-lighting from boats.

Many types of **nest trapping** methods have been developed, but the capture of breeding birds from nest sites is generally discouraged as disturbance at nest sites and colonies is likely to cause abandonment or nest failure.

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