

**THE INSTRUCTOR'S GUIDE TO
TRAINING PASSERINE BIRD BANDERS
IN NORTH AMERICA**

**A product of the
North American Banding Council**

**PUBLICATIONS COMMITTEE
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THE INSTRUCTOR'S GUIDE TO
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PREFACE

The purpose of this Instructor's Guide is to provide for all bander trainers in North America the basic information to instruct students safely and productively in the art and science of bird banding.

This publication is an integral part of the Banders' Study Guide. This Guide should be read by all banders and trainers. While individual trainers and stations may differ in some degree with the general guidelines set down in the Manuals and Guides, at the least, we and the North American Banding Council as a whole, suggest that full consideration be given to the guidelines and that trainees be fully exposed to the full variety of opinions that are in these publications.

This is a truly cooperative venture, representing many hours of work by many individuals and their institutions. As such, this is of necessity an inclusive document, including, as much as possible, all responsible views of banding in North America. As can be imagined, this was at times an interesting effort. We trust that the final product is worthy of the effort that all have put into it, and to the birds that we study and cherish.

—The Publications Committee of the
North American Banding Council
C. John Ralph, Chair

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-Publications Committee

1. INTRODUCTION

The North American Banding Council (NABC) consists of 18 voting members with representation from ornithological and banding organizations in North America. The mission of the NABC is to increase skill levels of banders by preparing and disseminating standardized training and study materials and establishing standards of competence and ethics. NABC has developed training and certification programs for banders and for trainers. The NABC hopes that by standardizing skills of trainees, banders in need of assistance can count on the skill levels of the banders with NABC training. The NABC has also developed a certification course for banders to become trainers. This training Guide was produced by the NABC for use by NABC-certified trainers.

The purpose of having a bander training program is to produce well-trained banders associated with excellent projects

contributing to the knowledge required for conservation and protection of birds. This bander training Guide has been compiled to assist the trainer in various aspects of the training procedure as it relates to landbirds, particularly songbirds. Other training materials are available from the Banding Offices (of the Canadian Wildlife and U. S. Fish and Wildlife Services) for waterfowl banders and will be developed as necessary for other groups of birds. This Guide should be helpful to all trainers, regardless of the target species.

Although the emphasis is on training people so that they can qualify for a Subpermit or Master Permit, a need also often exists for training less-qualified helpers at a banding station. In any case, the Guide is designed to assist you in three ways. First, it provides an overall framework for training banders, including a suggested order in which the main elements of the banding procedure may be presented. Second, under specific headings, numerous useful suggestions, tips and reminders to you, the trainer are listed. Third, it provides a comprehensive checklist and report card against which the progress of the trainee can be monitored.

Trainers are strongly encouraged to use this Guide in conjunction with *The North American Banders' Study Guide*. You may have useful training tips and reminders that we have overlooked in this Guide. Feel free to use them, and better yet, let the NABC Publication Committee know what they are so that the Guide can evolve.

Training bird banders can have its moments of frustration, but more often than not it is rewarding and refreshing. Good trainers invariably will have their eyes opened by trainees. Such refreshment can be exhilarating and really does help maintain good banding standards. We encourage all skilled and knowledgeable banders to take the opportunity to teach others their skills.

The bulk of this Guide consists of a checklist of skills. Most of the skills are accompanied by tips on how to teach them, points that require special emphasis when training, and thoughts on what level of skill the trainee should achieve.

Many different kinds of banding operations exist, each of which warrants certain kinds of training and emphasis. Naturally, you should take this into consideration when developing your own training protocol. The specific needs of trainees need to be considered, but you should give all trainees a broad introduction concerning the basics of banding. This should involve informing the trainee of the variety of techniques and equipment that banders use, not just the system you use yourself. Afterwards, you can concentrate on species likely to be encountered most frequently by the trainee and on special techniques for those birds. When appropriate, you can recommend that a banding permit be limited to a certain species or trap type, or be issued for use on a specific project only.

2. THE BANDER'S CODE OF ETHICS

Bird banding is used around the world as a major research tool. When used properly and skillfully, it is both safe and effective. The safety of banding depends on the use of proper techniques and equipment and on the expertise, alertness, and

The Bander's Code of Ethics

1. *Banders are primarily responsible for the safety and welfare of the birds they study so that stress and risks of injury or death are minimized. Some basic rules:*
 - **handle each bird carefully, gently, quietly, with respect, and in minimum time**
 - **capture and process only as many birds as you can safely handle**
 - **close traps or nets when predators are in the area**
 - **do not band in inclement weather**
 - **frequently assess the condition of traps and nets and repair them quickly**
 - **properly train and supervise students**
 - **check nets as frequently as conditions dictate**
 - **check traps as often as recommended for each trap type**
 - **properly close all traps and nets at the end of banding**
 - **do not leave traps or nets set and untended**
 - **use the correct band size and banding pliers for each bird**
 - **treat any bird injuries humanely**
2. *Continually assess your own work to ensure that it is beyond reproach.*
 - **reassess methods if an injury or mortality occurs**
 - **ask for and accept constructive criticism from other banders**
3. *Offer honest and constructive assessment of the work of others to help maintain the highest standards possible.*
 - **publish innovations in banding, capture, and handling techniques**
 - **educate prospective banders and trainers**
 - **report any mishandling of birds to the bander**
 - **if no improvement occurs, file a report with the Banding Office**
4. *Ensure that your data are accurate and complete.*
5. *Obtain prior permission to band on private property and on public lands where authorization is required.*

thoughtfulness of the bander.

The Bander's Code of Ethics applies to every aspect of banding. The bander's essential responsibility is to the bird. Other things matter a lot, but nothing matters so much as the health and welfare of the birds you are studying. Every bander must strive to minimize stress placed upon birds and be prepared to accept advice or innovation that may help to achieve this goal.

Methods should be examined to ensure that the handling time and types of data to be collected are not prejudicial to the bird's welfare. Be prepared to streamline procedures of your banding operation, either in response to adverse weather conditions or to reduce a backlog of unprocessed birds. If necessary, birds should be released unbanded, or the trapping devices should be temporarily closed. Banders should not

consider that some mortality is inevitable or acceptable in banding. Every injury or mortality should result in a reassessment of your operation. Action is then needed to minimize the chance of repetition. The most salient responsibilities of a bander are summarized in the Bander's Code of Ethics; more details are found in Section 13 of the Banders' Study Guide.

Banders must ensure that their work is beyond reproach and assist fellow banders in maintaining the same high standards. Every bander has an obligation to upgrade standards by advising the Banding Offices of any difficulties encountered and to report innovations.

Banders have other responsibilities too. They must submit their banding data to the Banding Offices promptly, reply promptly to requests for information, and maintain an accurate

inventory of their band stocks. Banders also have an educational and scientific responsibility to make sure that banding operations are explained carefully and are justified. Finally, banders banding on private property have a duty to obtain permission from landowners and to ensure their concerns are addressed.

3. GENERAL ADVICE

Not all good banders make good trainers. Quite apart from the fact that it is often surprisingly difficult to explain something that comes as second nature to an experienced bander, several specific personal qualities should be focused on and, if necessary, developed. A bander wishing to act in a training capacity should be knowledgeable and skilled in most, if not all, the techniques described in *The North American Banders' Study Guide*. A trainer also should show confidence, exhibit patience, be unlikely to lose temper in a crisis situation, make honest assessments relating to the trainee, show consistence and humility, be able to explain procedures without being dogmatic, and offer praise and encouragement whenever appropriate.

It is important to bear in mind that banding is part art and part science. While many aspects of the banding procedure can be learned effectively by rote, many banders feel that some elements, especially removing birds from nets and traps and, to a lesser extent, handling birds are more art than science.

Some trainees cannot "learn" some skills. If, after a reasonable period of training, you are reasonably certain that a trainee falls into this category, explain the situation as kindly as possible and attempt to dissuade the trainee from further exposure. The trainee still may have a useful role in a banding operation, and you can use discretion in recommending restriction to traps only, or recording, weighing, and releasing, if appropriate.

Most novice banders are apprehensive about handling something as delicate as a small bird, and larger birds are often a little intimidating. Part of the training process involves increasing the trainee's confidence. Explain that, for the most part, birds are remarkably robust. Demonstrate that the correct approach is to be firm but gentle and to minimize handling time without jeopardizing safety.

The old adage "practice makes perfect" applies well to bander training, except that perfection is never achieved, as even experienced banders continue to learn. This particular point cannot be emphasized too strongly, particularly in a training situation. Complacency can set in and result in mistakes. Throughout the training procedure, trainees should be encouraged to make repetitive measurements. This advice will be repeated in the appropriate sections later, but such repetitions and spot checks should be done **only** when the bird shows no signs of stress. Indeed, if at **any** stage of training the trainer perceives that a bird is under stress, the bird should be taken immediately from the trainee, with appropriate conciliatory remarks, and released or treated appropriately. To reduce anxiety and give the trainee reassurance, it is best that the trainee is warned beforehand that this may happen. For any particular skill, the trainer also should vary the size and type of bird on which repetitions are being performed.

In a similar vein, some trainees who are otherwise extremely

adept in acquiring new skills can get very frustrated, sometimes even despondent, with a perceived lack of progress. Such people should be strongly encouraged to persist. A useful line of approach is to point out that even highly experienced banders are always learning. By the same token, some trainees exhibit an uncanny ability and knack for the whole procedure, even though they may know very little about ornithology. Be prepared for all extremes.

From the above, it is obvious that you must evaluate prospective banders at the most basic level and at the earliest stage in their training. Banders need to be physically and emotionally able to conduct the work at hand. Do they have good finger dexterity? Can they see well? Do they have good hand-eye coordination? Do they have good depth perception? Do they have patience? Are they fit enough to traipse around the banding area every half hour? Trainers should not be afraid to gauge trainees before admission to a training program, nor to tell them that they have only a limited potential for hands-on work.

Most people will accept these basic requirements and be quite satisfied to help out in other ways, rather than risk harming birds.

In any given banding session, occasions may arise when training must be deferred, such as when many birds are in a net, or when a backlog of birds is waiting to be banded. Such situations, nevertheless, can be valuable training opportunities because the trainee can observe the trainer in action and learn how to record.

Trainees should be allowed to proceed at their own speed, but you must be satisfied that the trainee is sufficiently skilled to proceed to the next stage. Training can be sped up by constantly probing the trainee with questions about what is or should be going on, and also by encouraging them to question you as frequently as is practical. Questioning should be directed not just towards what is the appropriate course of action but increasingly towards "why" (or "why not"). Such an approach will encourage the trainee to appreciate the whole banding environment and enable more rapid progress towards acquiring the common sense, forethought, and awareness that are the hallmarks of a good bander.

Even once the basic skills have been mastered, it is a good idea to conduct spot checks on the trainee. It not only helps to assure you that the trainee is continuing to be meticulous, but also it can be a big confidence builder for the trainee, providing that the appropriate credit is given. We also suggest many "tests" to see if the trainee has been paying attention. You can do things like loosen net guy ropes or call out incorrect information to see if the trainee notices and takes appropriate action. Tell trainees that you will be doing this on occasion, after they have learned the basics, so they know they are expected to take the initiative. Misguided, polite trainees might otherwise decide to overlook and forgive your "gaffes." Trainers should keep in mind that trainees may have useful ideas for improving techniques, and that the training process can be a two-way street.

Finally, do not be afraid to make use of your trainees in your research; treat them as if they were full apprentices. They should act as helpful assistants, not as burdens.

4. ORDER OF TRAINING

The order in which you teach the various skills is up to you. Each trainer will have to tailor the program to the specific situation. However, common sense will tell you that things must progress from teaching the easy skills (e.g., recording) to the complex (e.g., ageing).

Two basic approaches can be used in training. One involves a trainee coming to the station on a regular, perhaps even daily, basis while banding is underway. We will refer to this as the "Intern" approach below. The other is a trainee who comes to a station and, along with the others, undergoes an intensive training program, that we will refer to below as the "Program" approach.

4.1. Intern Training

The following order of training is taken in part from the procedure generally practiced at Long Point Bird Observatory, where a variety of capture devices is used and where a large variety of birds is handled.

- (1) On the first day (or two), the trainee primarily acts in an "observer" role while all the various elements of the banding procedure (including basic record keeping, ethics, and bird safety) are explained. Except during any busy processing periods, the trainee records the data and assists in setting, opening, and closing nets and traps. As an introduction to the "hands-on" part of banding, and to maintain interest, the trainee may be given a few birds in the bander's grip for release. If not already done, the trainee must read the entire *North American Banders' Study Guide*.
- (2) The trainee must begin by mastering bird handling and the Bander's Grip. In passerine banding, bird handling practice is usually with medium-sized, docile birds (e.g., White-throated Sparrow, Swainson's Thrush). Raptor banders may start with a smaller species (Sharp-shinned Hawk, American Kestrel). At this stage, the practical rudiments of ageing, sexing, and measuring are introduced, together with practice transferring a bird from hand to hand and from person to person. The trainee also becomes familiar with placing birds in bird bags and removing them from the bags and traps. As a prelude to one method of extracting from mist nets, the photographer's grip is introduced and mastered.
- (3) For passerine banding, when it is evident that trainees are comfortable handling birds, they may begin to learn simple techniques for extraction from mist nets, usually on similar-sized birds. First, the trainer should demonstrate bird removal with a couple of birds. The trainer selects relatively untangled, quiet birds as a start and then progressively works up to more difficult situations. Through this entire initial training period, often lasting a week or more, the trainer personally oversees all of the trainee's bandings and extractions. As skills develop, the trainee is permitted to take on more and more solo responsibilities, but is cautioned constantly to contact the trainer immediately should any difficulties arise. As a general guide, the trainee is cautioned **not** to begin extracting a bird if any uncertainty exists as to how it entered the net. Two approaches have

been suggested for this critical, initial stage of training, involving how much time the trainer gives the trainee to extract the bird, as he or she encounters difficulties. (a) The first approach suggests that, should any bird take longer than five minutes to extract, help must be sought by the trainee. In the early stages of independent work on birds in nets, the trainer must be conveniently in voice contact at all times. (b) In the second approach, each trainee should attempt to remove a bird for something like 10-30 seconds, or until progress stops. Then the trainer takes over, completing the next step, and then turns it over to the trainee. The trainee then continues, starting the next step. This procedure is repeated until the bird is completely out. The trainer should take over completely if the bird becomes stressed or if the procedure takes longer than five minutes.

- (4) After a few days, the trainee should be capable of banding small birds, followed by learning to extract small birds from nets or traps. Larger birds can be attempted when they are caught.
- (5) Supplementary techniques such as skulling and molt assessment are dove-tailed into the program as appropriate. As basic skills are mastered, the trainer takes time to discuss scientific applications (if not addressed earlier). As soon as the trainee starts to solo on different elements of the program, the trainer begins making spot checks and testing to see if deliberate gaffes are noted. At this point, the trainee reads the Study Guide at least one more time.
- (6) If the trainee wishes to obtain a Master Permit, once all of the field skills are mastered, he or she should spend a week or more with the trainer, immersed in completing the various forms, producing banding schedules, data management, and other record-keeping details. Even a trainee wishing to obtain a Subpermit should be taken through some of these steps, especially those involving data entry and proofing.

4.2. Program Training

The philosophy of including an intense, structured, training program is to ensure that the trainee does not miss any important segments (as could happen with more than one trainer) and as part of a candidate's learning experience that reinforcement and evaluation take place in a short period of time. To this end, we suggest the intensive five-day schedule course in Appendix "C."

5. EVALUATING THE TRAINEE

The following material follows the Report Card (see Appendix A), section by section. Some aspects are essential for all banders; others can be ignored if the trainee is to be licensed only to work on a special project (e.g., the section on banding nestlings can be ignored if the person is training for a winter study of birds at feeders). Essential aspects are coded with an asterisk on the Report Card.

Exactly how you assess the trainee's skills for any particular element of the program is very much up to your personal judgment, based upon NABC standards and your standards as a

Permit holder and qualified trainer. The training process concludes with your overall assessment of the trainee's abilities. We recommend that the Report Card then be submitted to one of the Banding Offices for consideration and that both the trainer and trainee keep copies. This will facilitate upgrading of the trainee's skills in the future.

6. BACKGROUND MATERIAL TO COVER

Most of the background information to be learned about the administration of the North American banding system is detailed in the Bird Banding Manuals (Canadian Wildlife Service and U.S. Fish and Wildlife Service 1977, 1991) supplied by the Banding Offices. The trainee needs to be aware of this material and how to refer to and use the information. The Bird Banding Manuals do not however, address issues surrounding the ethics and humane handling of birds or the scientific merit of banding. This is where you should start things off, but you should come back to these topics throughout the training program.

6.1. Ethics of Banding Birds

The importance of understanding and observing the ethics of bird banding cannot be stressed enough. These should be included in every topic of the training program as elements for discussion. Discuss the Bander's Code of Ethics with the trainee. Ask the trainee to think of practical situations in which ethical questions are raised. For example, find out what the trainee would do in the following situations:

- (1) Many birds are in the netting area. You are only ten birds away from setting a new world record for number banded in a single day. It starts to rain.
Close the nets and forget about setting records.
- (2) Your friend is a fly fisherman and has asked you to collect a few crown feathers from Golden-crowned Kinglets.
Politely refuse and explain that it is against the Bander's Code of Ethics and illegal.
- (3) A farmer asks if he can borrow one of your traps to catch cowbirds and House Sparrows.
Politely refuse and explain that it is against the Bander's Code of Ethics and illegal.
- (4) A rare bird is captured and you would like to keep it on site for a couple of hours to let everyone else see it.
Show people as best you can, but a healthy bird never should be kept for more than about an hour and a half. Do not risk harm to a bird for the sake of pleasure.
- (5) A "good" bird that you have never banded before is captured, but it takes a size 4 band and you have only size 3B on hand.
Do not band it: all birds are "good" birds. Again, do not risk harm to a bird for the sake of your own pleasure.
- (6) A bird refuses to "sit" for a photograph.
An "uncooperative" bird merely wants to be set free. Get the best photo you can within about a minute, and then let the bird go.
- (7) A friend of yours has discovered that his nets catch a lot

more birds if a couple of House Sparrows are left in them to act as decoys.

Your friend is right in that decoys do work. He should be admonished however, for a serious breach of the Bander's Code of Ethics. Inform him that he is putting bird welfare at risk needlessly, that House Sparrows are indeed birds, and that the Code does not apply only to some species.

- (8) Things are really slow. You have had the nets open for five hours and have caught only one bird when a friend drops by and invites you out for a quick lunch. Your friend insists that you will be gone only for an hour "at the very most."
Feel free to leave the site, providing that all of the day's banding is done and that you close, furl, and tie all nets properly before leaving, removing the nets if necessary. Ask your friend to help. Do not risk leaving the site otherwise. Anything can (and does) happen.

Many situations pertaining to the Bander's Code of Ethics will arise when you are in the field with the trainee. Use such times to make sure that the trainee is able to answer correctly such questions as:

- (1) When does the condition of a net or trap make its use hazardous to birds? Why?
- (2) When should you close nets due to predators? Weather? Excessive catch rate?
- (3) How do you deal with an injured bird? How does an injury change how you report a banded bird to the Banding Office?
- (4) Discuss what bander safety hazards exist (e.g., guy ropes not properly marked, pegs in ground that may be tripped over, no facilities for washing hands)?
- (5) How can you offer honest, constructive assessment of the work of others in a diplomatic way?

6.2. How Bird Banding Fits into Scientific Studies

Emphasize that banding birds is not a conservation or research program in itself. The government does not have a conservation program called "bird banding," nor does it have researchers whose sole jobs are to look at data collected from banding. Banders are not making a contribution to research if they are banding birds only for the purpose of contributing to the North American database on banding and recovery. It is the responsibility of each researcher to ensure that study design and the collection and analysis of data are sound and that the results are published. The Banding Offices review all applications for permits and can deny an application because it lacks scientific merit.

If a trainee is having a hard time deciding on a research topic, emphasize that a great many basic questions remain to be answered about birds. For example, many gaps exist in our knowledge about ageing and sexing, molt strategies, winter site fidelity, and so on. Discuss the range of information that can be collected using bird banding studies. Then discuss the example of a well-designed research project that is given in Appendix C of *The North American Banders' Study Guide*. What role did banding play in the study? Can the same kinds of questions be asked about other species?

Pose a question (e.g., Do American Goldfinches show a

sexual difference in body size?) and then ask the trainee to tell you how a study might be designed to answer it. The trainee should be able to explain how ethics were considered in the development of the project design. Discuss things like sample size and the need to be realistic. Perhaps the question could be answered best as part of a cooperative effort with other banders. The trainee should be made aware of the value of cooperative studies like the Monitoring Avian Productivity and Survivorship (MAPS) Program and Operation Wingchord.

7. CHECKLIST OF PRACTICAL SKILLS

7.1. Processing

7.1.1. Identification and handling

7.1.1.1. *Recognizes all target species and releases a bird unbanded if identification cannot be made with 100% certainty*

A skilled trainee must be able to identify correctly all target species as well as any others that are to be expected in a general banding operation.

A couple of weeks before training, send trainees:

- (1) a list of the 20 most common species so that they can familiarize themselves with the plumages of the birds;
- (2) an annotated list of birds with reminders of problem species and a copy of the best guide book for the area.

During training, use a slide show to review breeding birds and more common migrants in the area. Particularly emphasize females and young birds.

Conduct a lab session with study skins (be sure some have spread wings). Make this a participatory exercise. The work stations might include:

- (1) groupings of similar species;
- (2) grouping of male and female birds of two or three species, matching species pairs;
- (3) asking for identification of juvenile birds such as thrushes, juncos, cowbird, and sparrows.

You can test this proficiency with specimens, a bird book, or slide quiz, and spot-check it in the field and in-hand. The trainee should obtain a high passing score for all target species and for a variety of age and sex groups. Some common birds (e.g., female House Sparrow, female Red-winged Blackbird) easily recognized in the field can fool beginning banders when in the hand. Hence, test in-hand identification as well as field identification. Also, proper identification sometimes requires taking accurate measurements and wing formulae, so you should introduce these aspects early in the training process.

Remind trainees constantly that it is OK to not know what species it is and that it is OK to release an unidentified bird unbanded, but that it is **not OK** to guess. Remember, unidentified birds should be documented in writing and (if possible) photographed.

If trainees need to work on identification skills, encourage them not to look at colors alone, but to look at other features as well (e.g., overall size, patterns of color, bill shape). Writing a rare bird description, even for a common species, is always a good way to train people to look at the whole bird. Do not restrict the trainee to field guides. Ensure that the trainee is

aware of publications such as Pyle (1997). When the trainee shows you a bird that he or she cannot identify, do not always provide the answer right away. Ask them to try to look it up, and help them through the process as if you were not quite sure either. However, also point out that the bird must be let go if its identity cannot be determined within a reasonable period (e.g., within half an hour).

Ensure that trainees can correctly identify feather tracts and anatomical features. Show the trainee how the various feather tracts overlap one another. Test trainees by covering over the legend to a diagram. Skilled trainees should be able to score near 100% on any kind of short test you can create. Again, a useful training exercise is to write a comprehensive rarity report, using a common bird, and asking trainees to describe, sketch, and label the various features.

Teach trainees how to properly number flight feathers in a variety of species. Trainees should appreciate that flight feathers are numbered in the order in which they usually molt, and know where to look up departures from this pattern for both passerine and non-passerine species.

7.1.1.2. *Appreciates the importance of minimizing handling time while not compromising safety*

Trainees must understand this apparent ethical paradox. Simply put, the idea is to process the bird quickly to minimize possible stress, but not so quickly as to get careless and risk injury or to fail to observe important features of each bird (e.g., for ageing and sexing purposes). Birds should not be held for inordinate periods for photo sessions, to work out identification, age, or sex problems, or when giving banding demonstrations to the public.

Skilled trainees should be able to process (correctly identify, band, age, sex, measure, and release) most birds completely within one to two minutes. Time the trainee's ability to do this on a random sample of ten birds. If processing routinely takes more than three minutes, more practice likely is required.

7.1.1.3. *Uses the Bander's Grip on a variety of species*

The importance of learning and using the correct Bander's Grip cannot be over emphasized. It is one of the keys to minimizing injury. The trainer should check knuckle separation frequently in the early stages of training. Training cannot proceed until the bird is safely handled and easily switched from hand to hand or bander to bander. Start off teaching this slowly, with only a few birds, preferably outside where the bird cannot be injured if it escapes, and where the trainee can have the satisfaction of releasing the bird.

Most trainees will be quite nervous until they have handled several birds, so it is best to give them a "break" after each of these early banding episodes. At this stage in the training, it is critical that you are full of positive comments and encouragement.

7.1.1.4. *Uses the Photographer's Grip safely*

Ensure that trainees hold the fingers tight against the bird's belly to prevent twisting and possible leg breakage, without grabbing the belly feathers inadvertently. Trainees must be

aware that some species are so weak-legged (e.g., goatsuckers and hummingbirds) that they must **never** be held in this grip, and others (e.g., herons) are unsafe to the bander when held in this grip. Again, repetition is necessary.

7.1.1.5. *Transfers a bird from hand to hand safely*

This skill should be mastered early in the training program as part of overall familiarity with handling. Its practical uses occur when passing a bird to another person, during extraction, and when switching hands to measure or look at the other wing. Trainees should be most comfortable holding birds in the hand opposite from the hand they use to write.

7.1.1.6. *Opens a bird's bill reliably*

The trainee should practice this technique whenever possible until mastered so that when the need for it arises in a bird whose tongue is caught, it is second nature. It should be performed on a variety of species, from hard ones like blackbirds down to kinglets. The technique also is required to age some passerines.

7.1.1.7. *Handles a variety of "awkward" species*

Make sure the trainee is able to handle safely species that are very small and have fragile legs (e.g., hummingbirds and kinglets); small and squirmy (e.g., wrens); small and aggressive (e.g., chickadees); have strong feet (e.g., starling, blackbirds); have strong bites (e.g., cardinal, grosbeak); large, vociferous, and flappy (e.g., flicker); have dangerous claws (e.g., small hawks, owls), and larger species (if appropriate). Discuss in theory how to handle a variety of species. What concerns should you have for your safety while handling a Mute Swan? Cormorant? Great Blue Heron? Even landbird banders will encounter these species.

7.1.1.8. *Releases a variety of species correctly*

Small birds should be released with care via an escape hatch or from an upturned hand. Emphasize which improper releases can damage a small bird and how. Trainees must show confidence when releasing raptors, holding the bird into the wind and releasing it up and away. At night, trainees must show diligence in placing an owl in a safe, dark spot and waiting until it has adjusted and flown away. Explain why this is done. Shorebirds are released by placing them on dry ground near a shoreline. Trainees must be aware of the possibility of leg cramps in shorebirds.

7.1.1.9. *Effectively deals with escaped birds in an enclosed space*

Birds do escape, even from the hands of experienced banders. However, the frequency should be very low. If the trainee constantly lets birds loose, then go back to the basics. Teach the trainee to avoid grabbing at an escaping bird (so tail is not lost or the bird is not injured by a clumsy grasp). Also teach how to recapture birds that escape in a closed space, pointing out the particular danger that windows present. If the bird cannot be recaptured immediately, the general rule is to open all windows and doors so that it can free itself rather than get hurt against a pane of glass.

7.1.2. **Banding**

For the first few birds, it is often a good idea for the trainer and trainee each to have a bird in the hand so that the demonstration can proceed in parallel. It is often easier for the trainee to see what you do and then mirror your actions, rather than to be told. This approach applies to both the banding and measurement procedures.

7.1.2.1. *Selects correct band size*

The trainee must know how to select band sizes under different conditions:

- (1) Selection according to Bird Banding Manual. Explain which is the preferred size if a choice exists. Encourage the trainee to select the larger choice for ground-feeding birds, to prevent build-up of debris between the band and the leg. Demonstrate the need for different band sizes according to sex (e.g., Red-winged Blackbird).
- (2) Selection with a leg gauge. Stress that even in situations where **only** a single band size is recommended by the Manual, if the trainee has reason to suspect that it may not be a good fit, the leg **must** be measured with a leg gauge. Have the trainee gauge each bird's leg for the first ten birds or so. Follow this up on successive days and then spot check at irregular intervals.
- (3) Selects a correct band size by eye. Ensure that trainees are familiar with this technique. Some leg gauges do not have all sizes, and gauges can get broken or lost. Hold a closed band behind the tarsus, and compare the space on each side of the band. Have the student try a larger and a smaller band size to see the difference on the bird.

7.1.2.2. *Reads band numbers correctly*

The trainee must know the number of digits to expect as a step to avoid making errors. Trainees must read the number twice on recaptures. Encourage the use of a magnifier if the trainee has any difficulty reading the tiny lettering. If the trainee consistently misreads numbers, then no point in continuing training in banding exists. Good eyesight is **essential**. The trainee can, however, still record and perhaps remove birds from nets if eyesight is not too problematic. Be on the look out also for trainees who may be dyslexic and therefore likely to scramble numbers.

Does the trainee understand that bands are to be used in sequence, that they are in sequences of 100, and that a band-size indicator is part of the band number? Be sure the trainee knows that the fate of each and every band must be recorded, even that of lost and destroyed bands. Trainees should double check bands prior to release.

7.1.2.3. *Applies a band correctly*

Band application should be taught with a variety of types of banding pliers, but especially with the kind the trainees will be using in their projects.

When opening a band, the practice of laying the pliers on the table and placing the band over the pins followed by using two hands to open the plier handles is to be **strongly** discouraged. It is a slow procedure and frequently leads to the band being over-opened and often subsequently deformed. Practice bands

(bands that will be reported as destroyed) should be used if a trainee continues to have problems with this procedure. The pliers should not be set down until after the bird has been banded (and then quietly). Encourage the trainee to close bands holding the index finger **between** the handles of the pliers to prevent sudden movement and overlapping. Ensure that the trainee really secures the band during the second squeeze to minimize any gap. The band is typically placed on a specific leg in a banding project. Individual banders develop a tendency always to band on one leg, but some times the band will have to be placed on the opposite leg (e.g., when the band is part of a color-band combination).

Ensure that the trainee understands the importance of holding the leg to be banded at the tarsal joint or by the foot. Show how also to restrain the other leg in species that tend to kick a lot (e.g., White-throated Sparrow) or to grab your hand (e.g., Common Grackle).

Here are some other useful tips. Throughout the banding operation, the trainer should see to it that the trainees increase their speed of processing to the point that common birds are being banded routinely (and safely) in under a minute. Is the trainee in fact making progress? Discourage trainees from talking to birds. Encourage the need for quiet. Trainees may try to "conceal" some of their actions below tabletop level or by holding the bird close to the body. Insist that you must be able to see everything that is going on. Make sure that the trainee remains focused on the bird (and all of its limbs) at all times. Make sure that the trainee learns not to become distracted at any time while handling birds.

Stress the importance (even virtue) of acknowledging a lack of knowledge, because hiding mistakes and incompetence introduces errors to banding records. Let the trainee in on the fact that even you do not know everything and that you are not afraid to admit it. Look things up in reference manuals to show the trainee that you too are engaged in the learning process.

7.1.2.4. Correctly applies a lock-on band (if appropriate)

Discourage the development of any practice that may lead to scarring the band inscription (e.g., using toothed pliers).

7.1.2.5. Correctly applies a color band (if appropriate)

If the trainee expects to use color bands subsequent to acquiring a permit, their use should be demonstrated and learned. Cover the range of types available and the advantages and disadvantages of each. Comment on the need to use colors that do not fade and are distinguishable in the field.

7.1.2.6. Recognizes when and how to correct an improperly applied band

Ensure that the trainee looks for gaps in the bands after each bird is banded. This is also important for retraps, particularly if the band is old.

See that the trainee knows how to use pliers to correct an unevenly closed band. Not infrequently, as a result of poor manufacture or opening the band asymmetrically, when the band is closed around the bird's leg, the two edges of the seam do not

meet exactly and two sharp "corners" protrude. The band effectively forms part of a spiral rather than a cylinder. In such cases, the flats on the ends of the pliers are used to correct the band. After this correction, the band may need to be tightened a little.

See that the trainee knows how to use pliers to correct a band about to be overlapped. Demonstrate the use of the flat tips of the banding pliers to bring the two ends level. If overlap already has begun, methods below may be used to pry the ends apart first.

7.1.2.7. Knows when and how to remove a band safely

Bands that are too tight, badly overlapped, or too loose should be removed. Also, if one or more digits are illegible, the band should be replaced. Removal also should be done if the band has worn so thin that it is sharp at the edges or is effectively a larger size and a danger to the bird. Have samples of such bands on hand (i.e., keep any illegible bands you have taken off) to demonstrate the problem. Discuss how illegible numbers should be reported to the Banding Offices and how the numbers are recovered. Bands with illegible numbers are to be sent to the Banding Office for etching.

Ensure that the trainee recognizes the need for the leg and band to be firmly held at all times during band removal and that band removal is often a two-person job. These techniques should not be practiced on live birds. Demonstrate and teach how to effect band removal using circlip pliers, thin wire or dental floss, and the point of a pen-knife; or two pairs of pliers for lock-on bands.

7.1.3. Storing and carrying birds

7.1.3.1. Uses the appropriate method of storage for particular species

The placing of raptors other than small owls in bags is discouraged. Does the trainee understand why birds are stored? Explain that it helps calm them down and also frees your hands and enables you to carry several birds at once.

The trainee must know which species and what numbers of birds may safely be kept together in one bag or holding box. Obviously pecky or grabby species such as vireos and icterids must be kept alone, and multiple birds in one bag should be avoided if possible. Any bird with pox-like lesions should be kept isolated and the bag and hands washed in detergent before reuse.

The trainee must show correct judgment regarding how long birds may be kept with respect to feeding habits, weather, onset of darkness, roosting habits, and nesting season. Point out that seed eaters and omnivores may be held longer than insectivores. As on many issues, pragmatism is in order, and any evidence that the time selected is too long must result in a shorter holding time.

Insist that insectivores be processed as rapidly as possible in cool or foggy weather. Make sure that the trainee understands that birds in cold weather, with low fat scores, birds must immediately be removed from nets and banded, or else banding should cease, or perhaps concentrate on seed eaters caught in traps. Note also the value of the bander having warm hands

when doing intricate work. Point out the risks of heat exhaustion in birds.

Watch the trainee closely for signs of alertness to potential weather hazards. Does the trainee drop everything and close nets at the first sign of an impending rain storm?

The trainee should be aware that, in general, diurnal birds should be released no later than a half hour after sunset. When trapping birds that fly to a communal roost (e.g., swallows), they must be released in time for this ritual. No specific times can be given, but local roost movements should be apparent.

Point out that dependent young must be processed as quickly as possible and returned to the nesting area or family group.

7.1.3.2. *Places birds in holding containers and carries and hangs them safely*

The trainee should be aware of the common holding devices for individuals in the species group that they will be working with, and the advantages and disadvantages of each.

If bird bags are used, make the trainee aware of the danger of loose threads on the seams of bird bags, ensuring that bags are used inside out. Ensure that the bird is in the bottom of the bag before looping the draw-string, that loops are not tied in knots, and any knots that do occur are untied as soon as they are encountered. When removing birds from bags, encourage the trainee to use the free hand to secure the top of the bag around the wrist of the hand in the bag. After removing a bird, the trainee should check that no other birds are in the bag and that the hitch is completely undone.

The trainees must carry bags around their wrists (without swinging them), attached to clothes pins, binoculars, or on a special hanger. A trainee **must** be discouraged **vehemently** from putting bags on the ground, on a belt, or hanging bags on trees or in nets. Make the trainee aware of other ways of carrying passerine birds (e.g., two to a hand, or shirt, or jacket pocket), but emphasize that these techniques are to be used only rarely and only as temporary measures.

The trainee must appreciate the reason for spacing out bird bags to permit air circulation. Sorting out smaller birds and more delicate species for earlier processing also is to be encouraged.

The trainee should understand why raptor banders use cans, and why different sizes are used. If banding at a passerine banding station, the handling of small raptors as accidental captures should be discussed. Other banders may use large holding cages for waterfowl or shorebirds to allow the birds to dry (and not constrict the legs in the case of shorebirds).

7.1.3.3. *Knows when bags or boxes need cleaning*

The trainee must be aware of health hazards to birds and humans from being exposed to dusty, dry bird feces, and should recognize when bags or boxes need to be cleaned. No strict guidelines exist for this. Look for trainees who display initiative to clean bags or boxes, perhaps with a gentle hint from yourself.

7.1.4. Field data collection

7.1.4.1. *Records data clearly, legibly, and accurately on field sheets*

Emphasize that all data need to be written clearly and legibly. Does the trainee understand why? Naturally, this is important so that other people (including nonbanders who may be involved in data entry at a later date) can make sense of the records. Also check that the trainee uses either a soft pencil or a permanent pen to enter data on the record sheets and understands the advantages of each implement. Also emphasize that "liquid paper" (not scribbles) must be used to make corrections of ink. Some field stations require that erroneous data be lined out with a single line and correct data written on the line immediately below. The advantages and disadvantages of different systems should be discussed with the historical importance in mind.

Get the trainee accustomed to keeping data sheets clean and dry. Encourage the trainee to keep and use tissue to clean up bird droppings, etc. on banding sheets as necessary. Does the trainee understand the value of the data sheets (i.e., that they must be treated like irreplaceable, priceless objects, because they are)?

You should constantly stress the importance placed on maintaining complete and accurate data. The trainee should be tested regularly throughout the training period. This can be achieved by calling out incorrect codes and other data when banding and ensuring that the trainee picks up on it. Try to maintain a strict order in recording data, usually in line with the order on the banding sheet, to make it less likely to overlook taking a datum.

Get trainees accustomed to double-checking band numbers at the very least whenever a new series is begun or a retrap is encountered; having the recorder read the numbers back in reverse order is a useful way to double-check a number. Test the trainee by deliberately omitting to announce the band number when banding, or by deliberately misreading it.

The trainee also should routinely check the full band number at series changes and at the start of each day. Does the trainee ask the bander for this information? Does the trainee ask for missed data and other information? Train and test the trainee by periodically withholding information when banding.

Ensure that the trainee knows and uses correct age, sex, how aged and sexed, species, and status codes. Does the trainee double-check all this information or just copy what was written before? Can trainees interpret these codes quickly and accurately, or do they constantly have to look them up or consult you?

For assessing accuracy, the trainer should conduct frequent spot checks at first. With the trainee present, all data should be reviewed by the trainer at regular intervals, and at least at the end of each banding session while the birds and data are fresh in the trainer's and trainee's minds. If training multiple trainees at one time, have them check each other's data, and discuss the best way to resolve any problems that they identify.

7.1.4.2. *Recognizes and takes description of or photographs rarities or unusual birds*

Show the trainee examples of rarity reports, both good and bad. Can the trainee distinguish between them. Have the trainee write a convincing "rarity" report for any bird you happen to have on hand, to see if the correct information is being selected. Does the trainee notice deformities or unusual attributes and note these on the banding sheet and status codes? Discuss drawings and photographs for documentation.

7.1.4.3. *Maintains complete and accurate daily logs or journals*

The trainee should help keep daily records of net and trap open and close times, mesh sizes and net lengths involved, personnel, net locations, trap types, weather conditions, and so on. This should be done on special data sheets, and the importance of this information to various types of research explained. A tabulation of the day's banding results often is useful, as is a short written narrative outlining the day's activities. Does the trainee show an awareness for the importance of such records? Does the trainee keep track of such things in a notebook so that the logbook can be filled in accurately? Naturally, you should set a good example.

7.1.5. **Biometrics (measurements)**

7.1.5.1. *Uses and accurately reads measuring devices (wing rule, balances, calipers, dividers)*

Wing rule.—The trainee should be able to repeat measurements consistently on the same wing to within 1 mm of measurements made by the trainer. A common error made by beginners (and fatigued banders of all skill levels) using wing rules with a highlighted intermediate 5-mm mark, occurs when the intermediate is mistaken for a 10-mm mark. This should be watched for and corrected at an early stage. Spot-check all wing measurements at regular intervals. When the trainee is recording, you can intentionally feed the trainee wrong wing chord measurements to test whether the trainee is developing a sense for the range of wing chords for different species.

Balances.—Introduce the trainee to a variety of weighing devices (e.g., triple-beam balance, Pesola scales, electronic scales). Ensure that the trainee gets into the habit of taring the scale with weighing containers at the start of each day's banding, if a self-taring balance is not being used. Many trainees spend inordinate amounts of time when using a triple-beam balance. Show them how to dampen the balance pointer with one hand while the other adjusts the weights. Some triple-beam balances permit interpolation. This should be encouraged, providing it is done accurately. As with the wing chord, you also can intentionally give the trainee wrong body weights as a test of growing awareness of body mass of different species.

Vernier or dial calipers.—Dial Calipers are relatively easy to use, but they are expensive. Many banders still use vernier calipers, and they can pose considerable problems for novice users. In such a case, the trainee should be made to practice on inanimate objects (a ruler is an ideal starter) until the skill has been acquired. As with wing rules, some people misread the 5-mm intermediate mark, if present. This should be looked for and corrected if necessary. Again, spot-check all measurements

regularly.

Dividers.—Several measurements, including culmen and tarsus, are more easily done with dividers. Some people tend to use too much pressure with calipers, especially stiff ones. The trainee should be encouraged to approach the bird from the side when using dividers, partly to prevent sudden movement, and partly because measuring is easier that way. Again, conduct frequent spot-checks.

7.1.5.2. *Correctly and accurately measures various anatomical features*

Wing chord.—Ensure that the trainee is absolutely clear on what method is required, and that they are indeed measuring the natural wing chord. Most trainees tend to flatten and sometimes straighten wings. Encourage the trainee to tilt the wing to reduce friction. The trainee should be alert to wings that are unnaturally bent following containment in a bird bag. The trainee also should recognize a wing point that is abraded or otherwise damaged, and be prepared to switch to the other wing if its point is intact. If both wings are abraded, growing, or broken, does the trainee correctly assess the situation and understand why the measurement is invalid or erroneous and therefore not worth taking?

Tail length.—The trainee may find the reverse grip easier for learning this technique. As with wing length, repeat measurements should be done until a 1-mm accuracy can be achieved consistently. Trainees should learn to use a variety of instruments but should find a stopless ruler the easiest.

Tail difference.—The trainee should be cautioned to look out for abrasion which will alter the reading. In such cases, the measurement still can be useful. For example, if the difference between abraded outers and unabraded inners in a forked tail still exceeds the criterion, the character is still valid.

Bill, tarsus, crown patch, hind claw, and footpad.—The trainee must be aware of the various categories of measurement and be alert as to which is required in a particular situation. Accuracy of bill measurements for small birds should be under 0.5 mm. Conduct regular spot-checks.

7.1.5.3. *Assesses simple wing formulae*

This can be attempted once the trainee has learned the numbering nomenclature and the number of primaries and secondaries to expect in a species (or where to look it up). The trainee should be able to identify and measure emarginated primaries. The trainee should be aware that wing formulae are not infallible, and that some species will occasionally show aberrant features (e.g., Traill's Flycatcher with an emarginated sixth primary). The trainee should begin with easy examples and progress to harder species, such as Warbling and Philadelphia vireos. The trainee needs to be able to find, number, and measure the longest primary. Ensure that the trainee checks to see that the primaries around the wing point are full-grown. When teaching how to compare relative lengths of selected primaries, this technique is best learned with repeated measurements. The trainee's efforts should be cross-checked with yours and an accuracy of ± 1 mm should be attained.

Practice on museum or other specimens may be beneficial and will cut down on time-consuming practice with live specimens.

7.1.5.4. *Assesses and records molt accurately on a molt card*

Because of the time involved, particularly with novices, it is better that trainees begin with robust species (e.g., blackbirds and sparrows) before progressing to smaller insectivores. Trainees should be especially alert to missing feathers. Do they have to be prompted for molt information, or do they routinely check for it and call it out?

7.1.5.5. *Accurately scores fat deposits*

Scoring fat deposits is relatively easy, but some beginners, especially older ones, have difficulty in blowing the feathers aside. Take care to prevent trainees hyperventilating. Show them how and where to direct their breath. Take the bird from them after, say, four attempts on the same bird. Encourage the trainee to check the underwing and around the vent for fat, too, especially on birds with little or no fat in the furculum. It is possible to wet the fingertips and part the feathers with the fingertips, or use a straw to blow the feathers apart. Demonstrate alternative techniques and discuss the drawbacks of each (takes time, but may be more accurate, can be easier to see if focal distance is a problem). Spot-checking is required for the first several dozen birds at least.

7.1.6. Ageing and sexing

In order to fully understand the value of different characters used in ageing and sexing birds, the trainee must be familiar with the life cycle. In a classroom situation, outline significant events in a bird's year. Identify the specific events, plumage used, state of sexual organs, flocking behavior, singing rate, fat levels, migration timing, egg laying, incubation, and fledging of young. Review bird topography, plumage sexual dimorphism, brood patch, cloacal protuberance, skull ossification procedure, and feathers commonly retained between molts.

7.1.6.1. *Correctly uses guides for ageing and sexing*

The apparent color of a feather tract depends both on the light direction and the angle from which it is viewed. This can pose problems when training banders to age and sex birds. For any given situation, ensure that the trainee comprehends exactly what they are supposed to be seeing. As a help, a progression should be followed, whereby initially the trainer holds and explains, then the trainee holds while the trainer explains, and finally the trainee holds and explains. Another useful progression to follow relates to characters. Begin with a species that is easy to sex by plumage, then species that are easy to age by plumage, and gradually move on to more difficult situations.

At all times, stress that "unknown" may be a completely acceptable age or sex determination, even if it appears to be precluded by Pyle (1997). It is better to record something as unknown than to guess. The trainee should be aware that unknown for age is not acceptable between January 1 and the breeding season that AHY replaces unknown at this time. The trainee must appreciate that wet plumage, abrasion, or some

other factor (including inexperience) will sometimes preclude reliable age or sex determinations. Also stress the fact that individual variation is common in many species of birds, especially in the fall.

Stress which age or sex guides are to be used as the primary reference: Pyle (1997) for all species covered; *North American Bird Banding Techniques, Volume II* (CWS and USFWS 1977) for species not covered in Pyle; which contain "reliable" features (e.g., Wood 1969); and which contain "useful" features (e.g., Pyle 1997). Explain the difference between "reliable" and "useful" features (e.g., "reliable" features have been shown to age and sex birds with 95% accuracy). Note how "useful" features should not be used alone but, rather, in conjunction with others, pointing out how such features often contradict one another. Also discuss how "useful" features are frequently comparative gradations (e.g., "narrower than," "brighter than"), which means that considerable overlap may occur and that gradations are difficult to interpret without much experience with the species in question. Explain why some characters have precedence over others.

Does the trainee know how to use a dichotomous key? Does the trainee understand what the slash (e.g., HY/SY) means? Does the trainee understand how to use the seasonal graphics for helping to decide acceptable age or sex codes? Does the trainee understand that the Bird Banding Manual is currently the most accepted source for age or sex determinations and that other references need be consulted only if the species is not covered in the Bird Banding Manual, or if further information is required or desired? Note that Pyle (1997) will replace the Manual for all species from doves through weaver finches and will be the new standard for ageing and sexing techniques.

The trainee should be aware that other texts may be appropriate for particular species, including Roberts (1980) and Godfrey (1986). For Holarctic species, Svensson (1992), Prater et al. (1977), and *Birds of the Western Palearctic* (Cramp 1977) occasionally can be very useful. Also, articles on age or sex regularly appear in some journals, especially *North American Bird Bander* and the *Journal of Field Ornithology*. Encourage all trainees (especially those aiming for Master Permits) to subscribe to both of these journals. Experienced banders keep a binder full of these updates on hand; your trainee should be encouraged to photocopy your set.

Encourage the trainee to note apparent exceptions or contradictions in the age or sex manuals. If warranted, these notes may be entered into the manuals themselves (in pencil, dated and signed); more frequently they are entered in the comments section of the banding sheet.

Does the trainee know the difference between basic and alternate plumages? Does the trainee understand how to interpret the bar graphs and age or sex couplets in Pyle (1997)? A good sign that trainees are having difficulty learning the information in age or sex manuals is when they constantly need to refer to the keys for species they have handled many times. Check to see whether the trainee is being cautious and verifying his or her memory against the key or truly does not remember.

7.1.6.2. *Accurately scores skull pneumatization*

Skull pneumatization is probably the most difficult technique to learn, stemming from the fact that many trainees do not know exactly what they are looking for and that it is simply hard to see. If possible, use a couple of museum specimens of skulls to demonstrate. On live birds, it is best to begin demonstrations with thin-skinned species, with an obvious dividing line between pneumatized and unpneumatized sections. Also require the trainee to look for dots (or absence of them) on "trace" or fully ossified skulls, rather than make a judgment call based on the color of the skull. Explain that skull color is **not** what should be viewed but, rather, dots pneumatized in areas and clear areas in unpneumatized areas. We strongly recommend requiring the trainee to use a magnifying lens even in good light, or outdoors. Many banders assert that a magnifier is always necessary. Emphasize that a magnifier should at least be available at all times to verify any uncertainties. Make sure each trainee does several birds, especially those with thick skins, molting heads, and small windows.

Discuss equipment that helps in skull evaluation (water, lamp with strong diffuse light to reduce glare, an Optivisor or magnifying lens set on a support stand so hands are free, or a jeweler's lens). One trick that helps with thick-skinned (e.g., blackbirds), dark-skinned (e.g., chickadees), or molting birds, is to bring the loose skin of the back of the neck up to the skull region. This skin is often quite transparent and lacks pigment. The neck skin also is less likely to have "dandruff" or a lot of pin feathers if the bird is undergoing a body molt. While the training should begin with birds that are easily skulled, your final evaluation needs to include difficult examples.

Discourage guesswork. Spot-checking is an absolute necessity for many dozens of skulls. For many species, you may be able to age the bird yourself by glancing at its plumage or some other obvious feature, without needing to skull each one yourself. Still, you must check the trainee on scoring.

7.1.6.3. *Correctly uses other characteristics for age determination*

Juvenal plumage.—Explain the term juvenal. Encourage the trainee to look for the loose feathering of juveniles, especially on the nape, belly, and undertail coverts. Explain the difference between a brood patch and a juvenile's bare belly.

Molt and differing feather generations.—The trainee should comprehend the confusing terminology in different manuals (e.g., prealternate and prebasic, versus postbreeding and postjuvenile). An understanding of molt sequence should include partial postjuvenile and complete postbreeding adult molt, as well as the numerical sequence of molt in flight feathers. A "calendar" of typical events in a bird's life can be prepared in relation to molt sequences. A molt key could even be sketched out. Have the trainee explain various molt strategies to you. Teach the trainee to recognize different generations of feathers by shape, texture, color, and abrasion. Color is particularly important in primary and secondary coverts, whereas shape and abrasion are most useful on flight feathers. Ensure that the trainee understands how these features can provide important clues about a bird's age. Encourage the trainee to make comparisons in good light. Contrasts in the primary and secondary

coverts are best observed when the wing is almost closed, removing any transparency to the feathers. The trainee should recognize true (as opposed to adventitious) molt. Explain how birds can lose feathers but not be molting, hence the need to check each wing and both halves of the tail, especially if molt seems at all strange. Explain typical molt sequences and the differences among limited, partial, incomplete, and complete molts and how a knowledge of these can be used to age birds.

Fault bars.—Ensure that the trainee is aware that bars have to be uniform across feather tracts in young birds. Caution against misidentifying an adult tail that is regrowing after complete accidental loss. Contrast with growth bars.

Feather abrasion (wing and tail).—Ensure that the trainee is aware of the faster rate of abrasion (especially of the tail) in ground-feeding birds, that the first two tail feathers (the inner ones) are generally more abraded because they are on top and therefore more exposed to light and wear, and the extreme wear in woodpeckers and creepers. Discuss the relative wear of feathers according to pigment (e.g., white feathers are weaker than black feathers).

Shape of tail feathers.—This skill can be quite difficult to acquire, even for an experienced bander, but you should at least touch upon it. Ensure that the trainee looks at the tangent at the turning point on the inner web, and not the feather tip itself, as well as at the width of the inner web. The trainee also should be aware of how abrasion affects tail shape, especially in spring, and particularly on feathers with pale edging (e.g., adult Black-capped Chickadee). Encourage the trainee to assess more than one feather in case a feather has been lost and regrown in an adult shape. Does the trainee understand that HY/SY birds tend to have "pointier" feathers, not because of feather wear but because that is how they are constructed? Make certain that the trainee demonstrates full awareness that feather shape must be used with caution and only on certain groups of birds (thrushes, some warblers), and that it is not reliable or easily determined in other groups (mimids, vireos, *Empidonax* flycatchers). It must not replace other more reliable methods of age determination (e.g., skulling in fall).

Eye color.—Encourage the trainee to look for this character in good light, preferably sunlight. Use of a lens is often helpful. Discuss the rapid change that can occur in eye color.

Mouth color and gape.—Explain how the color of the inside mandible (lower bill) always is paler due to the tongue and throat lining and that the maxilla (upper bill) color is what should be checked. Make sure the trainee can distinguish a juvenile's fleshy gape. Ensure that caution is exercised when using a gape mark for ageing, especially in finches and thrushes.

7.1.6.4. *Understands and assigns correct age codes*

The main point to get across is that age is treated on a **calendar year** basis. Consequently, *all birds have a birthday on 1 January*. This will help resolve how to handle an apparent choice (e.g., HY/SY) in a manual. Some trainees have difficulty with the implied equivalence in age codes (e.g., AHY is second year or older, or alternatively **not** hatching year). Sketch out a "calendar" for the trainee, showing how a bird's age changes with the changing calendar years. An example is shown in Table 1.

Does the trainee appreciate when age or sex should be recorded as unknown? Does the trainee **guess**? Does the trainee understand the consequences of such guesswork? You can test the trainee orally by asking questions like:

- (1) It is August. What age is a bird that has an apparent brood patch and a trace (just the first margin pneumatized) skull?
Answer: HY. The apparent brood patch is really the bare belly of a juvenile. When in doubt, go with what the skull tells you.
- (2) What age should be given to a bird that is captured on 21 September 1995 with a trace skull?
Answer: HY.
- (3) What age should be given if exactly the same individual is recaptured on 2 January 1996, but its skull is fully ossified?
Answer: The HY bird had a birthday on 1 January, so it must be AHY, and more precisely a SY. However, unless the bird shows plumage criteria of a SY, you must call it a AHY – do not age birds based on previous data.

7.1.6.5. *Correctly uses color, size, brood patch, and cloacal protuberance for sex determination.*

Color.—Have the trainee name ten species that can and cannot be sexed by plumage color. Caution that AHY/ASY females and HY/SY males often can be difficult to separate in some species.

Size.—Have the trainee name five species that can and cannot be sexed by wing chord. Does the trainee understand the concept of "overlap" and bimodal curves?

Brood patch.—Ensure that the trainee can distinguish a brood patch from sparsely feathered bellies seen in juvenal plumage and during molt. Describe the appearance of the various stages of a true brood patch, using photos or examples to illustrate. The trainee must be aware that the males of some species can develop partial brood patches, and care must be taken when sexing these species using this technique. Why can this technique not be used for cowbirds? Can it be used for woodpeckers?

Cloacal protuberance.—The trainee should realize that females in the breeding season often show a swelling in the cloacal region. Encourage the trainee to look closely at potential protuberances to ensure that they have the typical bulbous appearance before being sexed as male. Does the trainee understand that the **absence** of a brood patch or cloacal protuberance usually means nothing?

7.1.6.6. *Evaluation procedures*

The major factors in processing are accuracy and speed. During the evaluation, in order to pass, the error rate should be

taken and generally be quite low. Watch the trainee process several birds. Check their evaluation of various characteristics by repeating the process on the same birds yourself and evaluating their results.

- (1) Measurement data, such as wing length or weight, should differ on the average by no more than 3% from the trainer's measurements.
- (2) In qualitative measures (e.g., the class or degree of brood patch development or fat class), a top-rated trainee would agree with the trainer in 95% of the measures. A trainee that is just passing should differ by no more than one class in four out of five times. A passing trainee would never differ by more than a single class.
- (3) The time to process a bird, including identification, placing the band on the bird's leg, and assessing its physical condition should be approximately a minute when fully trained, unless supplemental data are taken. During evaluation, the time should be noted as a trainee takes data on each bird, the error rate noted, and time averaged for each trainee for at least ten birds. Here is a suggested evaluation scale, but each trainer can make his or her own.

	Mean time to process	Error rate of measurement	Qualitative errors	
			Agree	Disagree 1 class
Top	<1:00	< 1%	>95%	<5%
Pass	<1:30	< 3%	>80%	<20%
Marginal/Fail	<3:00	< 5%	>50%	20-40%
Definite fail	>5:00	> 5%	<50%	>50%

In addition, evaluation should include notes on their ability to comfortably handle the birds without unduly stressing them.

A written test at the end of the training period will be a valuable way to see if the trainees understand what they are looking at on the bird. Questions could include items such as: What does a skull of 0 mean? Describe what a brood patch of 3 would look like. If a bird's skull value was one and it had a BP of one, what does this mean?

7.2. **Special Authorization for Mist Netting**

7.2.1. **Erecting, opening, and closing nets**

7.2.1.1. *Chooses an appropriate netting site and appropriate net*

After demonstrating various existing net sites and explaining the reasons for their existence, get the trainee to pick potential new sites and explain why they might be good. A netting site is

Table 1. Example of a calendar of a bird's age classes by year and month for trainees.

Year	1		2	3	4
Month	June	July-Dec	Jan-Dec	Jan-Dec	Jan-Dec
Age	L	HY	SY or AHY	TY, ASY, or AHY	TY/AHY

selected based upon likely bird movements, paying equal attention to sun and wind exposure, habitat structure, and the time required to conduct a net round. This ability is essentially intuitive but can be learned with demonstrations and experience.

The trainee must appreciate the value of background and vegetation height in terms of net visibility and efficiency. The trainee must understand the effect of sunlight on catchability, safety of birds in the net, and the durability of the net itself. Introduce the trainee, preferably with examples, to one- and two-panel nets for use either in specific sites or to target certain species. Discuss, and if possible demonstrate, canopy nets.

For some target species, wind often is inevitable, but a properly set net is safe and effective in moderate wind. Light wind can be an advantage at times by keeping birds low and making them easier to drive into the wind (and the net). Nevertheless, the trainee should point out wind-blown nets and take steps either to reduce the problem or to close the nets.

Terrain and slope are additional considerations. Bumpy ground is a poor situation, with the net too low in some spots or the shelf strings too close together. If possible, demonstrate this with the trainee, actually setting up a net on uneven ground (and then relocating it to a better site). Discuss or demonstrate why steep slopes should be avoided.

Nets can be placed to the sides of trails (animal or human) but never across them, for obvious reasons. Likewise guy ropes should not cross an obvious path where people or animals can trip on them. As a general rule in populated areas, nets should be positioned out of sight to avoid vandalism and disturbance to captured birds.

The trainee must know which mesh size, height, and length to use depending on the situation (habitat, weather, and target species) and program specifications (e.g., MAPS). The selection of length and height is relatively easy, but the correct choice of mesh size and the combination of material, denier, and ply are more difficult. The trainee **must** be aware of the safety considerations involved, so the need for an informed choice cannot be over-emphasized. Does the trainee know how to measure mesh size?

Take the trainees to an area with no nets. Divide them into groups of two to four and have each group locate five potential net sites, marking them with flagging. Discuss the likelihood of capture at each site and the problems associated with each choice of net arrays in relation to the difficulty of terrain and time of a net round.

Evaluation procedures.—Evaluation takes place during the field session while setting up potential new net sites. The major problem is likely to be the focusing on a single criterion by a trainee, such as avoiding morning sun, to the exclusion of other equally important criteria. As the trainees tell you the reasons for the choice of each site, make sure that **all** criteria are given more or less equal weight.

7.2.1.2. *Correctly sets up nets unaided*

Many things need to be taught and learned about setting up nets. Present the various methods of erecting and taking down nets. Do not present only a single method, as different people will find different methods more suitable for their situation. The basic methods all involve essentially permanent sites with fixed

locations for the poles. The differences usually involve the method of rolling up the net onto a spool, into a bundle for a cloth bag, or around a pole. Methods of fixing a pole in place also will vary, depending upon site. Poles can be shoved into soft sand, rebar can be in place for at least one end in reasonably soft soils or gravel, and rock cairns must be used for the more firm substrates. Methods of tying guy ropes also will differ. Ensure that the trainee has mastered all of the following points:

- (1) Clears an adequate space around the net. In addition to dealing with obstructions around the net, the trainee must be alert to potential hazards such as an overhanging branch that could be weighed down with wet snow, or a dead tree nearby that could blow down over the net. Does the trainee show initiative? Make sure that the trainee knows to remove hazards at ground level (e.g., stumps) and at eye level. Again, the trainee must show initiative.
- (2) Secures guying points. This is extremely important because the collapse of a net must be avoided at all cost. The net set up should be robust enough to withstand wind gusts and even minor collisions against a pole.
- (3) Correctly judges guy angles. Many trainees tend to set the guys too steeply, the extra tension from the net can lead to pegs pulling out or the guy snapping. Guy line is the cheapest element in the set up—it should not be used sparingly.
- (4) Assembles loops on pole in correct order. Does the trainee correctly identify the top shelf-string, particularly if it does not have a color-coded loop? Does the trainee drop loops frequently or take a long time to get them correctly ordered, only to get them mixed up again when putting them on the pole?
- (5) Selects and ties appropriate knots in guys. This may appear somewhat trivial, but the trainee must understand the importance of knots that are easy to tie, especially unaided and with the guy under tension. The knots must be totally secure yet easy to undo. A tight knot is never an excuse to postpone making an adjustment to a net for bird safety. The bowline, clove hitch, and round turn and two half-hitches should become second nature to the trainee. A tight slip knot also can be used to quickly make adjustments in guylines without the need for untying and retying knots. Have the trainee practice these knots and teach them to others.
- (6) Pays out net safely, away from ground and side vegetation. Make sure the trainee is always attentive to the need for keeping the net from getting caught on anything.
- (7) Avoids vegetation when untwisting net. Demonstrate the two techniques used for untwisting nets, with the loops in hand and with the loops on a pole.
- (8) Correctly retrieves shelf-string loops that have catapulted through the mesh. This requirement is too often ignored. **Not** doing it puts an extra strain on the netting around the loop and reduces the amount of bag in the area. Deliberately demonstrate what you mean by fouling a loop within the net.
- (9) Sets adequate tension. Show the trainee how to use bird bags to simulate the weight of one big bird or lots of small birds. Show the trainee how a net looks when it lacks

adequate tension, perhaps by deliberately angling one of the poles. Teach the trainee to check the tension at least daily, especially with new nets. Does the trainee understand that net tension is important to maximize catch rate and to enhance bird safety? Does the trainee take the initiative to adjust the tension on loose nets? Secretly loosen one and see. If not, point out what you did and remind the trainee that she or he must take the initiative. What if the net is too tight? Birds are more likely to bounce out or be injured. Nets that are too tight can cut birds or injure fast-flying birds. Nets near areas where large birds or fast-flying birds may be caught can have rubber bands at one or both ends.

- (10) Sets correct bag depth. The trainee must learn to test the bag frequently, not only when setting nets but also during the day if the conditions change. Ensure that the trainee uses a bird bag to test the pocket depths. If large species are the target, insist that a bundle of bags of the same approximate weight is used. In an exposed site, make sure the trainee tests the pocket by throwing a bird bag upwind into the net. Does the trainee pull the top shelf-string down properly (by the loop) or improperly (by the thread)? Is a furling pole or makeshift stick used when necessary? Does the trainee reset the net after the top panel has been lowered? Secretly lower one to find out.
- (11) Positions bottom panel at safe height. The trainee should be aware that the safe height will vary depending on knowledge of potential local predators and on the height of the ground vegetation. Does he or she test this height?
- (12) Checks net condition once set up, including assuring that no mesh is caught on the tethering knots. Does the trainee check the net immediately after set up? Is he or she aware of the increased visibility of the top shelf-string and the reduced bag resulting from caught netting? Help set up nets with the trainee for the first few days, then give him or her the responsibility. Then tour the net site together and point out any deficiencies, noting also any good points.
- (13) Correctly sets up two or more nets with shared poles. Demonstrate how this is done with two people and solo. Mention how it helps if the two nets are of the same type, brand, and height. Talk about the advantages of double sets (e.g., less weight to carry into the field with fewer net poles; fewer guys are required).

7.2.1.3. *Properly furls and unfurls a net*

Stress the importance of always checking a net **thoroughly** for birds and debris before a net is furled, especially in bad light. Do not let the trainee get away with leaving debris in a net. Demonstrate what a pain it is to remove bits of twigs and leaves that have been rolled up in a net. Nets are easily damaged when they are unfurled with debris caught in them. Does the trainee exercise initiative in this regard, to the point that it becomes an automatic reflex? Does the trainee take a moment to remove debris during each net round, not just when nets are to be furled?

Make sure the trainee learns to tuck net spills near the loops safely back between the shelf strings. Have the trainee master net close-down on the first day. Spot-check for the next few

days, pointing out any difficulties. Pay close attention to using ties on the net once it is furled. Teach the trainee good habits early on. Make sure that a furling pole (or makeshift stick) is used to lower high loops.

Ensure that the trainee learns to place the ties in a secure, convenient place for temporary storage. Does the trainee routinely carry around a furling pole or stick to raise and lower the top panels of nets?

When nets are to be closed because of a sudden rainstorm, the first priority is to close and loosely furl the nets as quickly as possible. Once they are all closed and the rain has let up a bit, they can be revisited later to do a better job.

7.2.1.4. *Takes in and stores nets and associated equipment properly*

Make sure that loops are tied together properly. Demonstrate your favorite technique and explain the importance of keeping the net free of tangles. Do not just demonstrate; let the trainee take the nets down under your supervision, so that all aspects are learned.

Ensure that the trainee is aware that if the net is wet or even damp when taken down, it should be dried out as soon as possible. What is the reason for labeling nets in poor or damaged condition? Discuss and define nets that are in poor, good, and excellent condition.

Poles and guys should be retrieved and stored tidily indoors so they do not get lost, stolen, or rotten.

7.2.2. **Operation and extraction**

7.2.2.1. *Judges how many nets to use safely and checks them frequently and carefully*

The number of nets that can be operated safely depends on distance from banding location, anticipated number of birds, weather conditions, and the number and qualifications of the people on hand. Although this knowledge can come only with experience, explain what you are doing and why, right from the beginning, so that judgment will eventually rub off on the trainee. On a busy day, you can test this judgment by suggesting that more nets be opened to break last year's record. What is the trainee's response? After a good deal of training, ask the trainee for an opinion of how many nets should be opened today, which ones, and why, or when do they think nets should be closed? Does the trainee later take the initiative to close nets when too many birds are being caught?

Describe several potential scenarios and ask the trainees how they would handle the situation.

Stress the importance of making frequent net checks to reduce stress on the birds, chances of predation, and bad tangles. Net rounds without birds should not take more than 15 minutes, and time must be allowed to process captures. Individual nets must be checked regularly with no more than 45 minutes recommended between checks during daylight hours. The maximum time between net checks at night may be longer in ideal weather. Nets should NEVER be left open without regular checks; this practice may result in loss of banding privileges.

Ensure that the trainee understands that nets must be checked more often (even continuously) in hot or cold weather, when the nets are in direct sunshine, when the public is visiting,

when many birds are being captured, and so on. Make net rounds worth anticipating. Always show your eagerness, even on slow days. Test the trainees regularly by waiting for them to suggest a net round (provided that the interval does not become excessive).

Stress the importance of making careful (not casual) inspections of every net. Pass on the tip that birds in the net may be more obvious when viewed from the end of the net, and from this view it can be more obvious which side of the net the bird entered. Most importantly, stress how a small bird (especially one that is caught in the bottom panel or at the opposite end of a net) can be overlooked unless the entire length of the net is **carefully** inspected. A bird in the bottom panel can be more obvious when the bottom line is shaken. It often helps to use the same route so that a net does not get forgotten. It also helps to number or name your nets (e.g., based on landmarks), so everyone knows which nets are being discussed.

7.2.2.2. *Demonstrates an astute, accommodating approach to extraction*

The trainee must accompany you for several days and observe while you carefully explain the logic behind the extraction of each bird. Once the basic grips have been mastered, along with some simple bird banding, it is time to let the trainee attempt extraction. Whatever you do, do not start off with anything remotely difficult. Inspect the birds and select only those that you think you could easily extract in well under 30 seconds. Provide plenty of praise when a trainee makes a successful extraction. As the trainee begins to master easy extractions and gets to the point of removing birds in under a minute, offer more difficult extractions. Whenever you see a trainee begin to run into complications or failing to make progress on a particular bird, however, you take over. Insist that the trainees watch how you sort out the "difficulty." Talk through every step of the process as you perform extractions with them watching.

Do not forget that extracting a bird is a one-person proposition—two people trying to work together is seldom very successful. Trainers should remember this and generally try to resist the temptation to physically help the trainee's extractions along. When help is required, take over.

It will probably be at least a week before you feel comfortable enough to allow the trainee to make solo net checks. It is useful however, if you give the trainee a bit of "space" prior to that time. For example, you could both work on different birds in the same net or on different nets in close proximity.

Here are some questions you should ask yourself when assessing a trainee's skill level. Does the trainee check nets irregularly and without careful and close inspection of each net's contents? Take a long time (more than a minute) to extract simple birds? Display ongoing nervousness, awkwardness, roughness, or hesitation? Try to extract birds through a net backwards? Want to cut birds out regularly? Cut birds out without permission? Not carry or use scissors or toothpick? Get birds more tangled than they were originally? Or not seek help when it is needed? This part of the training program is probably the most subjective to evaluate, but if you answered "yes" to any of the above questions, the trainee has not mastered extractions

and cannot be graded as being skilled. Any trainee that can routinely extract "simple" birds safely, unassisted, and within a minute can usually be considered to be qualified.

Teach more than one technique for extraction (body grasp, legs first, wing-head-wing, etc.) and discuss when each should be used. Trainees should never be given mandates for speed like "any bird should be extracted in 30 seconds." Increasing speed will come with practice and should never be stressed over the welfare of each individual bird.

7.2.2.3. *Extracts a variety of species quickly and safely*

The trainee must be exposed to as many different species as possible. Examples include: small delicate species (e.g., hummingbirds, kinglets); short-winged, wriggly species (e.g., Winter Wren, Common Yellowthroat); strong-clawed species (e.g., Red-winged Blackbird); pecky species (e.g., chickadees and titmice); strong biters (e.g., cardinal and grosbeaks); long-winged species (e.g., swallows); species with "long" carpal joints (e.g., shorebirds); raptors; and any other appropriate species pertinent to the trainee's anticipated project.

It is important that trainees be exposed to as wide a variety of species as possible and become skilled at holding and extracting them. This is true even in specialized operations because nontarget species are caught incidentally. Even duck traps regularly catch more than just ducks.

7.2.2.4. *Deals proficiently with tricky situations*

Only after trainees have mastered routine extractions should they progress to more difficult situations. Make sure that you cover each of these situations thoroughly before allowing a trainee to solo. Teach the trainee when and how to use various aids (e.g., toothpicks, scissors, twigs). Emphasize the need for patience and logic in handling **all** tricky situations. Explain that what often looks like an insoluble mess can often be dealt with easily if you just take a few moments to assess the situation fully, **before** actually getting to work. It is just like solving a puzzle. Immense satisfaction accrues in being able to skillfully (almost magically) free a bird that looks badly tangled but really is not and greater satisfaction in freeing a bird that is really badly tangled.

Final evaluation should consist of both an oral and a practical test. A skilled trainee should be able to answer most or all of your questions concerning how frequently nets should be checked, what to do in case of an emergency, how long should be spent trying to extract a bird before seeking assistance, what to do in different weather conditions (temperature, sun exposure, wind), and so on. A skilled trainee will be able to extract birds in any of the following tricky situations in **well** under five minutes. Be careful however, with putting such a time limit or pressure on yourself or a new bander.

"Thighed" individual.—A bird with net tangled around the leg or the net firmly grasped in its claws is apt to be the most common and simplest situation to handle. Explain that, in many cases, it may be best to use the body grasp method and leave the thighed leg until last.

Caught tongue.—Ensure that the trainee knows how to use a toothpick, pencil, very small twig, or grass stem. Make sure that

the trainee is supplied with a personal device to be carried at all times.

Caught carpal joint(s).—The trainee must know when it is safe to take a wing right through the mesh and how to do it.

Spun individual (bottom-panel).—Explain that the legs may need to be freed first before the bird can be placed in a grip and spun back. Alternatively, the netting can be unwound with the fingers of one hand while the other hand holds the bird stationary. The trainee must realize that the wing that has caused the spinning must be restrained to prevent possible wing strain and to prevent the bird's spinning again.

Spun and double-pocketed individual.—In this situation, the legs almost certainly will have to be temporarily freed first before proceeding. It may mean working first on one side of the net, then the other, clearing the bird free of one pocket before a "clear belly" can be found.

Up and over top shelf string.—Insist that the trainee use a furling pole to lower the top shelf string. Attempts to pull netting down by hand or hold shelf strings down should be **strongly** discouraged. The trainer must ensure that the trainee resets the shelf strings **and** bag correctly after such an event.

Up and over an intermediate shelf string.—Again, the legs will usually have to be temporarily freed.

Round a side string.—This can be a real tricky one to figure out. It usually involves working on both sides of the net, sometimes at the same time.

7.2.2.4.1. Evaluation procedures

Practical ability to remove birds.—Evaluating the ability of someone to remove birds is difficult because each bird presents a unique challenge. A person who consistently removes a bird in less than a minute with no assistance from the trainer is clearly well qualified. A person who hesitates at each step, who is too careful or too careless, clearly needs more work. Between these extremes, we offer here a method for the trainer to grade each bird's entanglement, the trainees extraction ability, and the time of removal of several birds, preferably at least ten that are being removed by each person on the following scales:

Bird entanglement status.

- 1 - Bird passive in net with wings and feet unentangled.
- 3 - Bird moderately active, with some entanglement of bend of wings and net firmly grasped in its feet. A clear pocket made by the bird's entry.
- 5 - Bird very badly entangled, with no clear pocket of entrance.

Intermediate values of two and four should be assigned to those birds with intermediate status of entanglement.

Bird extraction ability.

- 1 - Bird is firmly, decisively, and rapidly removed.
- 3 - Some hesitation in approaches to removal. Sometimes starts on one entangled part of bird, then moves to another, then back. Considering the bird's entanglement status, takes a moderate time to remove.
- 5 - Much hesitation in removal. Usually starts on one part of bird, then moves to another, then back. Does not approach removal systematically and by the type of entan-

glement, but by rote. Considering the bird's entanglement status, takes a very long time to remove, or is unable to remove it.

If the trainee does not pass the evaluation, then he or she must continue to practice taking live birds from the net with trainer supervision.

A suggested range of evaluation scores and the potential grades for each would be as shown in Table 2, although the trainer's judgment should be followed.

We suggest that a person should have at least a "pass" score on 80% of all birds removed, and no lower than "marginal" on the others. The evaluation procedure should be repeated for those who did not pass the first time. If the trainee does not pass on the second attempt, then the trainee's ability to carry out constant-effort mist netting should be reevaluated.

7.2.2.5. Recognizes and repairs nets that are in poor condition

Use an old net (if necessary) to demonstrate what you mean by poor condition (e.g., broken loops, broken shelf strings, many large holes, weak or rotten mesh). Teach the trainee how to maintain nets and do simple repairs. Have him or her make several repairs on small holes. Does the trainee then take the initiative to repair nets? Explain how to properly dispose of a net and why burning is preferable.

7.3. Traps

7.3.1. Has knowledge of range of traps and their target species

Discuss the advantages and disadvantages of the main types of traps and which is best under different circumstances. Explain how and why birds are caught in each kind of trap. Make the trainee think. Ask him or her to design a trap for safely catching an ostrich.

Trap choice depends on the target species, prevailing weather, and other factors such as tide and wave action.

Table 2. Suggested range of evaluation scores for extraction of birds from nets.

Grade	Entanglement status	Extraction ability	Time necessary for removal
Top	1	1	0:10
	3	1	0:30
	5	2	1:00
Pass	1	2	0:30
	3	2	0:45
	5	3	2:00
Marginal	1	3	1:00
	3	4	2:00
	5	5	5:00+
Fail	1	4	5:00+
	3	5	not removed
	5	5	not removed

7.3.2. Operates traps properly and safely

The trainee should know and demonstrate what time schedules are appropriate for checking different types of traps and in various weather conditions. He or she should know the potential dangers of traps to birds (minor injuries around the bill from improper mesh size or type, scratches from wire ends, closing doors that hit birds, etc.). If possible and appropriate, have the trainee help you construct a trap.

The trainee must be aware that, while traps may be used in more inclement weather than mist nets, limits exist. In light rain, **only** large traps such as Helgoland and House Traps can be used. In small traps, birds will get wet very quickly from contact with the walls. On the other hand, Helgoland and House Traps should not be used in very strong winds (birds can be blown into the walls), whereas ground traps are permissible.

Does the trainee know how to operate and close the trap properly? Trainees must learn to avoid setting ground traps on bumpy ground, as birds can escape or get trapped under the walls and injured. If necessary, build up the site with sand, gravel, or snow.

For baited traps, novices tend to use too much bait. Bait should be limited to the trap interior, although some seed dumped in the trapping area can act as an initial encouragement in a new trapping site before a portable trap is put out. Likewise, for larger traps, bait the trap and leave the door open for a day or two to get birds coming to the site. Have the trainee think like a bird. Why does a bird enter a trap? What does it do when a human approaches and how does this flight reaction affect how you approach a trap?

For Helgoland and House Traps, trainees must be aware of the value of placing branches in the ramp area, the role of the grading device inside the catching box, and the need to inspect the trap for any sharp edges or gaps between the wall and floor. The entrance to the catching box should **never** be left open; self-caught birds may harm themselves or other birds if left in the catching box for any length of time.

Point out that not all birds in the area around a Helgoland Trap can be caught, and that no need exists to chase down every single bird. Indeed, concentrating on one individual will result in several others escaping. Emphasize that birds that break back behind the drivers may be captured on the next drive, particularly if the banders leave the site by a roundabout route.

Most large traps have catching boxes where birds are "herded." A few designs, however, do not use a catch box. Birds usually are taken from these traps by using a dip-net on a pole. This can be a little tricky and requires practice and training to do safely.

Most catching boxes have slotted rubber flaps or sleeves through which birds are removed. Small birds should be enclosed in the Bander's Grip to protect them. Large birds should be brought out in the reverse grip to prevent flight feathers from being bent backwards and possibly damaged. Do not let large birds bounce on top of small birds in the catching box. Always protect small birds from bigger ones; stress how order of removal is important. For example, if 20 juncos and one grackle are in the same catch box, the grackle is removed first. If 20 grackles and one junco are together, then the junco is removed first. Does the trainee keep the plexiglass dry and

clean? Why is this necessary?

7.4. Nestlings

7.4.1. Follows species and date and age guidelines in the Banding Manual

Normally, nestlings of cavity- and dome-nesting species (e.g., Bank and Cliff swallows, Winter Wren, and woodpeckers) are not banded in the nest. Does the trainee understand that banding these species usually results in the nest suffering some damage and that such damage is unacceptable? Woodpecker nestlings can be safely extracted using a noose (Jackson 1982), but only with extreme care and from about days 4-10 of nestling life.

Is the trainee familiar with the age guidelines? Make sure that she or he is able to age nestlings or estimate their age. The trainee also must be able to assess readiness for banding of nestlings of unknown age. Knowledge of the sequence and growth rate of nestling feathering must be acquired.

7.4.2. Approaches nests responsibly and removes, handles, bands, and replaces nestlings safely

The approach should be indirect, with a minimum of disturbance. For treetop nests, a mirror on a pole and for cavity nests a mirror and a light are used for checking contents until banding is timely. Make sure that the trainee recognizes signs of parental disturbance and backs off if disturbance cannot be limited to about five minutes. Is the trainee quick to process nestlings with the least disturbance possible?

7.5. Ethics and Injuries

7.5.1. Knows and practices the Bander's Code of Ethics

It is best to have the trainee memorize and recite the Code of Ethics. Keep on driving these ethics home throughout the training period. Point out the professional damage that can result from breaking the spirit or letter of any law (including those regarding transport and possession of wild birds and specimens).

The trainee must believe that a zero casualty rate is the correct target. Any sign that the trainee is developing a cavalier or insensitive approach to bird handling **must** be suppressed immediately. If it persists, then training should be terminated.

7.5.2. Shows excellent awareness of injury prevention

First make sure that the trainee has a comprehensive knowledge of injuries that can occur during banding. Awareness of injury prevention must be demonstrated during capture through weather monitoring, anticipation of bird numbers, and assistants available. For example, the trainee must know when to close traps or nets due to large numbers of birds or deteriorating weather conditions, and must come to you for advice on this. He or she must also understand which data are most critical to record when a backlog of birds needs to be banded quickly. Point out circumstances that require release of unbanded birds at the net or trap site.

You should emphasize why dependent juveniles must be released near their capture location. Some banders also do this

for nesting birds. Also explain that these birds should be processed as quickly as possible and that family groups should be released together. Show judgment in determining when banding may cause too much disturbance to local breeding birds. Demonstrate an appreciation of the need for balance between disturbance and scientific value of data being collected. Show judgment indicating when an injured or weakened bird should not be banded. Discuss how to deal with predation problems.

Does the trainee suggest innovations, point out potential problems, and take initiative? Review causes of any injuries and point out what steps can be taken to avoid recurrence. The trainer must develop this skill by questioning a trainee when an injury occurs. Diplomacy and sensitivity should be exercised if the casualty is a result of the trainee's actions. Sit down and discuss the occurrence calmly and with reassurance.

7.5.3. Shows familiarity with the most common injuries and their causes

Ensure that the trainee is able to recognize signs of stress in birds. If the trainee verbally communicates concern about a particular bird's condition, appreciate the value of this sensitivity. This also is a good time for the trainee to learn how best to handle and treat a bird that is stressed.

7.5.4. Demonstrates ability to treat minor injuries

Can the trainee diagnose common injuries and provide prognoses for recovery? Discuss and demonstrate (as appropriate) before guiding a trainee through treatment processes and before the trainee is permitted to undertake the required treatment.

7.5.5. Recognizes and demonstrates the need for euthanasia

Does the trainee understand the circumstances under which euthanasia is necessary and humane (i.e., when a slow and painful death is otherwise certain)? While theoretical knowledge usually must suffice, euthanasia techniques should at least be demonstrated on a specimen. Although rookie trainees never should be allowed to euthanize a bird, advanced trainees ultimately should be required to do so, should the occasion arise. Give your trainees fair warning and the chance to opt out. Never show a cavalier attitude towards euthanasia.

7.5.6. Assesses whether a specimen is worth preserving

Any dead bird that is reasonably fresh and in good condition can and should be salvaged as a specimen. Discuss the value of specimens to science and education. Remind trainees of the conditions under which salvage permits are required and who can legally keep specimens (and for how long the U.S. federal banding permit allows six months but states may have shorter periods). Does the trainee know what details need to be recorded for specimens? Point out that specimens can be salvaged for relevant institutions under both U.S. and Canadian permits.

Discuss inappropriate disposal methods and why they are inappropriate.

7.5.7. Records details of all injuries and casualties

Encourage trainees to yield this information as soon as it happens, never to suppress it. Ensure that injured birds are reported with correct status and remarks in field data, so they are correctly indicated on banding schedules and noted in station journals on logs. If nothing else, the information can be used to prevent recurrences.

You should exhibit noticeable emotional reaction to any injury or casualty. Does the trainee also react sensitively? If not, why not? Be prepared for tears; they are not infrequent. Offer reassurance as necessary, put the casualty into perspective for the benefit of the trainee, and call for a "time out." Each and every casualty or injury should result in discussion about why it happened and how it can be avoided in the future.

7.6. Health and Safety of Banders

7.6.1. Demonstrates a responsible attitude towards potential injuries and diseases from birds

Quiz the trainee about risks to banders and how they can be minimized. Does the trainee heed your advice?

Encourage the trainee to use carbolic or other germicidal soap. Are the trainee's hands constantly dirty? Set a good example yourself.

The trainee should know the symptoms of avian-borne diseases. While the risks are small, if any strange illness is contracted, particularly a respiratory one, a doctor should know that bird contact might be involved.

7.6.2. Demonstrates a responsible attitude towards physical hazards in the banding area

Does the trainee take initiative and deal with potential hazards, such as logs and branches? For example, are missing guy-line flags replaced? Remove some and find out. Emphasize that you want trainees to be able, ultimately, to run a banding operation solo and that they must be able to take full responsibility.

7.7. Data Management

7.7.1. Proofs and corrects banding sheets

At an advanced level, the trainee should help you proof banding sheets. To help teach and assess proofing abilities, trainers can make up a dummy field sheet that includes common errors (see Table 3). The trainee must be able to find, understand, and correct all mistakes before being recommended for Master Permittee status.

7.7.2. Completes banding schedules properly and unassisted

Have advanced trainees assist you with the preparation of your banding schedules, constantly reminding them of the need for accuracy. To obtain a Master Permit, a trainee must be able to complete a banding schedule properly and unassisted.

For computerization of banding data, the trainee must be taught how to enter data and how to use a program and its various editing subprograms. As a lesson, you can have the trainee enter incorrect information from the dummy banding sheet (Table 3), and have the trainee run this information through the various editing programs to produce a corrected schedule.

Table 3. An example of a dummy banding "sheet" with many errors.

Full Band Number of first band on this sheet: 1910-76101

Location: Hamilton, Ontario

Band # (last 2 digits)	Species	Species code	Age	Sex	Status	Date	Comments
01	Palm Warbler	PMWA	AHY	M	300	10-13-94	
02	Yellowthroat	YTWA	HY	F	300	10-13-94	
03	Ruby-crowned Kinglet	RCKI	AHY	M	300	10-13-94	aged by skulling
04	Yellow Warbler	YEWA	U	u	300	10-13-94	
05	Black-capped Chickadee	BCCH	AHY	M	300	10-13-94	Injured right foot; old injury
06	Carolina Wren	CARW	AHY	U	300	10-13-94	
07	Least Flycatcher	LEFL	AHY	M	301	10-13-94	
08	Alder Flycatcher	ALFL	HY	U	300	10-13-94	
09	Cape May Warbler	CMWA	L	M	300	10-13-94	
10	Black-capped Chickadee	BCCH	ASY	U	300	10-13-94	
11	Tennessee Warbler	TEWA	AHY	M	300	10-12-94	date is correct
12	Ruby-crowned Kinglet	RCKI	HY	U	300	10-13-94	1 red feather on crown
13	Tennessee Warbler	RCKI	AHY	M	300	10-13-94	
14	Unidentified Flycatcher	UNFL	U	U	300	10-13-94	Maybe a Pine!
15	American Redstart	AMRE	U	M	300	10-13-94	

The following errors appear in Table 3 (listed by band number):

- 01: Palm Warbler should be recorded as to geographic race (e.g., Western Palm Warbler) and coded appropriately (e.g., WPWA). Also, should be U - cannot sex this species in fall.
- 02: Species name and code do not match (presumably Common Yellowthroat and coded as COYE, as unknowledgeable recorders are apt to confuse codes used for Common Yellowthroat and Yellow-throated Warbler). Just to be safe, the bander should be asked if any Yellow-throated Warblers were banded. Also, cannot sex young female COYE (should be U sex).
- 03: Cannot age RCKI as AHY by skulling after 30 September. Should be U age if no notes are given on other characters.
- 04: Wrong species code (should be YWAR).
- 05: Cannot sex BCCH in fall (should be U sex); injured birds (whether new injuries or old injuries) should be status 500.
- 06: Should be comment about why the wrong band size was used (e.g., wrong band size used due to extremely thin tarsus).
- 07: Should be comment regarding color band (e.g., red band on left leg).
- 08: Given the geographic location (southern Ontario), there should be a comment regarding how the bird was identified (e.g., identified by wing formula and culmen length); otherwise should be recorded as Traill's Flycatcher (TRFL).
- 09: Cannot have a "local" bird of this species in October (should be aged as HY if skull incompletely ossified).
- 10: Usually cannot age this species as ASY in fall (should be AHY).
- 11: No mistakes; suitable comment is made concerning out of sequence banding date.
- 12: No mistakes; suitable comment is made concerning inability to sex bird.
- 13: Species name and species code do not agree. This is probably the worst possible of all mistakes. It can usually be sorted out only by referring to additional data recorded (e.g., wing chord and body weight). Otherwise, the **usual** assumption is that TEWA is correct and that the RCKI species code was merely copied mistakenly from the previous line. However, some comment should be made that identification is questionable and that the bird may in fact have been a RCKI. If in doubt, report as "data lost."
- 14: Unidentified birds should never be banded, even if you are sure it was a flycatcher, warbler, or sparrow. This bird should have been released unbanded after being photographed and documented.
- 15: Age is unacceptable; all male AMRE can be aged (comment should be made why the bird was not aged).

Note that the data editing process does not necessarily end when the schedules are submitted. Schedules have yet to be reviewed by the Banding Offices in Canada and the U.S. They may be returned if substantial correction is required. Otherwise, minor errors reported by the Banding Offices should be corrected on a copy held by the Master Permittee.

7.7.3. Handles other paperwork correctly and promptly

Under limited supervision, let the advanced trainee complete the band encounter forms and band orders, send in schedules and notes to file, and handle queries from the Banding Offices. Point out the need for promptness. Requests for band inventories and other information also may be delegated fruitfully.

7.8. Public Relations

7.8.1. Communicates effectively with the public about banding

Ensure that the trainee is aware of the need for good public relations and of some of the potential conflicts that can arise in banding operations that are open to public scrutiny. Encourage the trainee to be sensitive, polite, and friendly, even in awkward circumstances when visitors are critical of the operation. However, let the trainee also know how to deal firmly with visitors who may take it upon themselves to interfere with operations (e.g., a visitor who tries to take a bird out of a net).

Talk to visitors and explain what is going on and why. After a while, the trainee should be encouraged to give a banding demonstration with close supervision. Follow up early demonstrations with praise and a few helpful pointers. Later, when you are confident in their abilities, advanced trainees should be allowed to design and give their own demonstrations. Ensure that the Bander's Code of Ethics is not forgotten in the excitement.

7.8.2. Communicates effectively using banding data (reports, articles, etc.)

As a start, encourage trainees to write articles for local papers, naturalists' club newsletters, etc. Later, they may be persuaded to write or co-author an article or short paper in the local banding association newsletter, or in *North American Bird Bander*.

8. THE NORTH AMERICAN BANDING COUNCIL

The mission of the North American Banding Council (NABC) is to promote sound and ethical bird banding principles and techniques in North America. Skill levels of banders will be increased by the preparation and dissemination of standardized training and study materials and the establishment of standards of competence and ethics for banders and trainers.

The immediate objectives are:

- (1) to develop a certification and evaluation program by setting standards for experience, knowledge, and skills that must be attained at each level (Assistant, Bander, and Trainer);
- (2) to produce and update training materials such as manuals and perhaps videos;
- (3) to identify and certify an initial pool of trainers; and
- (4) to encourage cooperative efforts in the use of banding in the study and conservation of North American birds.

The NABC consists of 18 to 20 voting members, including one representative appointed by each of the following organizations: American Ornithologists' Union, Association of Field Ornithologists, Cooper Ornithological Society, Colonial Waterbird Society, Eastern Bird Banding Association, Inland Bird Banding Association, Ontario Bird Banding Association, The Pacific Seabird Group, Raptor Research Foundation, Society of Canadian Ornithologists, Western Bird Banding Association, Western Hemisphere Shorebird Reserve Network, and Wilson Ornithological Society. In addition, two representatives are appointed by the International Association of Fish and Wildlife Agencies (one from Canada and one from the United States). Other groups have been invited to become affiliated. The NABC also designates from four to six additional members. The directors of the Canadian and U. S. Bird Banding Offices are nonvoting members of the NABC. The NABC was incorporated as a nonprofit California corporation in 1998. Although it is expected that NABC's expenses will be covered by a small fee from applicants for banding certification, donations are being solicited during this start-up phase.

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APPENDIX A. TRAINEE'S REPORT CARD

Not all categories need to be checked for a certification. Some categories usually are considered fundamental however, and will probably need to be assessed for all prospective banders. These are identified by an asterisk (*).

BACKGROUND MATERIAL

- * Understand the ethics of banding birds
- * Understand how banding fits into scientific studies

CHECKLIST OF PRACTICAL SKILLS

PROCESSING

Identification and handling

- * Recognize all target species, and release a bird unbanded if identification cannot be made with virtual certainty
- * Appreciate the importance of minimizing handling time while not compromising safety
- * Use the Bander's Grip on a variety of species
- * Use the Photographer's Grip safely
- * Transfer a bird from hand to hand safely
- Open a bird's bill reliably
- * Handle a variety of "awkward" species
- * Release a variety of species correctly
- Effectively deal with escaped birds in an enclosed space

Banding

- * Select correct band size
- * Read band numbers correctly
- * Apply a band correctly
- Correctly apply a lock-on band (if appropriate)
- Correctly apply a color band (if appropriate)
- * Recognize when and how to correct an improperly applied band
- * Know when and how to remove a band safely

Storing and carrying birds

- * Use the appropriate method of storage for particular species
- * Place birds in bags, and carry and hang them correctly
- * Recommend when bags or boxes need cleaning

Field data collection

- * Record data clearly, legibly, and accurately on field sheets
- * Be able to recognize and take description of or photograph rarities or unusual birds
- * Maintain complete and accurate daily logs

Biometrics

- * Use and accurately read measuring devices (wing rule, balances, calipers, dividers)
- * Correctly and accurately measure various anatomical features
- Assess simple wing formulae
- Assess and record molt accurately on a molt card
- Accurately score fat deposits

Ageing and sexing

- * Correctly use guides for ageing and sexing
- Accurately score skull pneumatization (if appropriate)
- Correctly use other characteristics for age determination

Understand and assign correct age codes
Correctly use color, size, brood patch, and cloacal protuberance for sex determination

*SPECIAL AUTHORIZATION FOR MIST NETTING

Erecting, opening, and closing nets

Choose an appropriate netting site and appropriate net
Correctly set up nets unaided
Properly furl and unfurl nets
Take in and store nets and associated equipment properly

Operation and extraction

Judge how many nets to use safely and check them frequently and carefully
Demonstrate an astute, accommodating approach to extraction
Extract a variety of species quickly and safely
Deal proficiently with tricky situations
Recognize and repair nets that are in poor condition

TRAPS

Have knowledge of range of traps and their target species
Operate traps properly and safely, if appropriate

NESTLINGS (if appropriate)

Follow species, date, and age guidelines in Banding Manual
Approach nests responsibly and remove, handle, band, and replace nestlings safely

ETHICS AND INJURIES

- * Know and practice the Bander's Code of Ethics
- * Show excellent awareness of injury prevention
- * Show familiarity with the most common injuries and their causes
- * Demonstrate ability to treat minor injuries
- * Recognize and demonstrate the need for euthanasia
- * Assess whether a specimen is worth preserving
- * Record details of all injuries and casualties

HEALTH AND SAFETY OF BANDERS

- * Demonstrate a responsible attitude towards potential injuries from birds
- * Demonstrate a responsible attitude towards physical hazards in the banding area

DATA MANAGEMENT

- * Proof and correct banding sheets
- Know how to complete banding schedules properly
- Handle other paperwork correctly and promptly

PUBLIC RELATIONS

- * Communicate effectively with the public about banding
- Communicate effectively using banding data (reports, articles, etc.)

OTHER SPECIAL AUTHORIZATIONS

Demonstrate proficiency in the following special authorizations (specify as appropriate, e.g., color-banding, use of special traps, etc.)

APPENDIX B. TRAINER'S RECOMMENDATIONS

I _____ (name of trainer) have trained and witnessed _____ (name of student) and am satisfied that all necessary training has been successfully completed and that he or she qualifies for a:

- Subpermit
- Master permit

to band the following species groups:

- waterfowl
- seabirds
- shorebirds
- raptors
- landbirds

with the following authorizations:

- to use mist nets
- to use cannon nets
- to use chemicals
- to use color marking
- to use radio transmitters
- to band endangered species
- to take blood samples

Signed: (trainer)

Dated:

Permit #

Special Species or Trapping Restrictions (please list):

Other Comments:

APPENDIX C. PROGRAM TRAINING SCHEDULE FOR CONSTANT-EFFORT MIST NETS

Below is a suggested schedule for an intensive, five-day course. It includes material other than just banding and processing and is oriented towards landbirds. Depending upon content desired and the level of trainees, it can be modified easily. It relies upon rapid feedback and is intended to provide the minimum training for a reasonably adept person to rapidly become more qualified. Alone, a five-day course will not be sufficient for a person to become a fully competent bander or to obtain a permit. When coupled with past or subsequent experience at a banding station, however, the trainee can achieve the level of competence necessary.

DAY 1. Removing Birds from Nets

- 13:00 Discuss the fragility of birds and problems associated with removing them from mist nets.
- 14:00 If available, show a video of removal methods. Discuss emergency procedures for injured birds.
- 15:00 Use specimens to practice methods of removal.
- 16:00 If appropriate, depending upon evaluation of trainer, at least some trainees can begin to remove live birds.
- 17:30 Complete day's session.

DAY 2. Removing Birds from Nets (contd.)

- 06:00 Set up nets and continue to remove live birds for all personnel. Those needing more practice with specimens should be allowed this.
- 11:30 Take down nets and discuss problems, solutions, and procedures for handling of stressed or injured birds.

Data Processing

- 13:00 Classroom material, going over life cycle of a bird.
- 14:00 Review video or overhead material of data taking and processing. Have trainees fill out sample forms.
- 14:30 With a couple of nets open, the trainer should process a bird completely. After release, detail each topic.
- 15:30 Open more nets and the trainees start to process birds.
- 17:30 Completion.

DAY 3. Removing Birds from Nets and Data Processing (contd.)

- 06:00 Set up nets and continue to remove live birds and process captures for all personnel. Evaluate performance of trainees.
 - 11:30 Take down nets and discuss results of evaluation.
- #### Determining Location for Nets
- 13:00 At an indoor location, go over the considerations necessary for the placement of nets.
 - 13:30 Using photos and maps, or an actual array, evaluate potential capture rates at each net site.
 - 14:30 Locate new net sites in an area and evaluate the potential for capture.
 - 16:30 Completion.

DAY 4. Removing Birds from Nets and Data Processing (contd.)

- 06:00 Set up nets and continue to remove live birds and process captures for all personnel. Evaluate performance of trainees.
 - 11:00 Take down nets and discuss results of evaluation.
- #### Erecting and Taking down Nets
- 13:00 Discuss and describe the methods. Show the commonly used knots and the different types of ropes.
 - 13:30 Demonstrate each method with very experienced personnel.
 - 14:00 Have each pair set up a net, with each using at least three different methods.

Vegetation Assessment and Bird Censusing

- 15:00 Describe and discuss objectives of assessments and censuses.
- 16:30 Carry out measurements at single points with all trainees present and taking data. Compare results.
- 17:00 Discuss and evaluate results.
- 17:30 Completion.

DAY 5. Removing Birds from Nets and Data Processing (contd.)

- 06:00 Set up nets and continue to remove live birds and process captures for all personnel. Evaluate performance of trainees.
- 10:30 Take down nets and discuss results of evaluation.
- 11:00 Written evaluation.
- 12:00 Completion.