Migratory Birds in Research

Animal User Training

Environment Canada
Canadian Wildlife Service

Environnement Canada
Service canadien de la faune

Last update: April 2008

Module Goals

- Provide an introduction to the legal, ethical and safety considerations for those who work with migratory birds in research
- Provide a document with reference to specialized resources to help investigators prepare for field work

Please note: This module does not replace hands-on training

Training Module Outline

- Introduction
  - Canadian Council on Animal Care (CCAC)
  - Institutional Animal Care Committee (ACC)
- Permits and Permissions
  - Federal Permits
- Key Points in Planning a Study
- Capture
- Restraint
- Health Evaluation

Training Module Outline

- Bird Banding and Marking
- Medical/Surgical Procedures
- Short-term Housing
- Transportation
- Release
- Euthanasia
- Human Safety Considerations
- Practical Training

CCAC

- Canadian Council on Animal Care
  - Responsible for overseeing use of animals in research, teaching and testing
  - Established a system of institutional animal care committees
  - Ensures appropriate animal care and use through CCAC site visits and assessments
  - Participants include academic, government and private institutions
  - For more information, please visit the CCAC website

CCAC

- Use of animals in research, teaching, and testing is acceptable only if contributing to:
  - understanding of fundamental biological principles
  - development of knowledge expected to benefit humans, animals or the environment
- CCAC guidelines have been developed specifically for field studies that use wildlife
- Investigators are expected to be familiar with all CCAC policies and guidelines relevant to their studies

CCAC and the Three Rs

- The Three Rs:
  - Replacement
    - Can research be achieved with non-animal models?
  - Reduction
    - How many animals are required for statistical significance?
  - Refinement
    - Has a research protocol been thoroughly examined to ensure replacement and reduction options have been addressed and that possible pain and distress are minimized at all stages?

Categories of Invasiveness

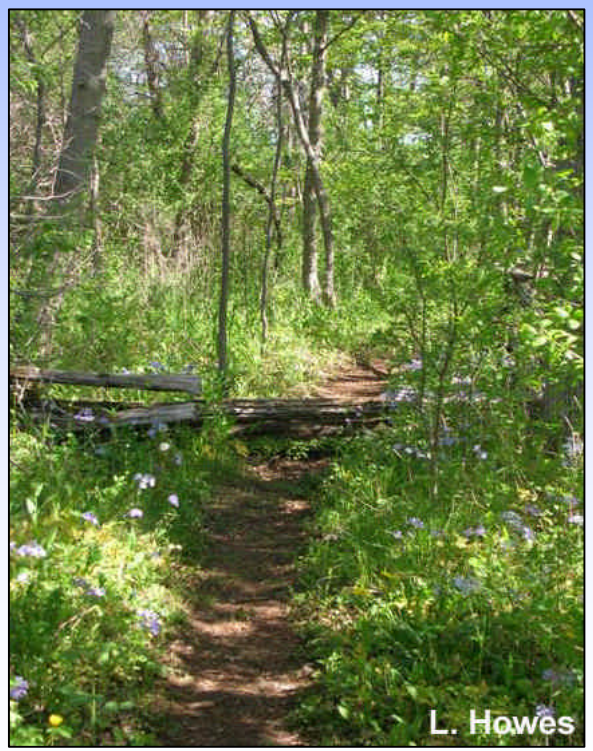
- CCAC Categories of invasiveness
  - Category A: invertebrates or other live isolates
  - Category B: little/no discomfort or stress
  - Category C: minor stress/pain
  - Category D: moderate to severe distress/discomfort
  - Category E: severe pain/discomfort

Animal Care Committee

- Role of institutional ACC
  - Provides ethical review of research protocols prior to study
  - Conducts visits to animal facilities and makes recommendations
  - Oversees all animal care and use
  - Provides animal use data to CCAC
- Project protocols must be approved by the local ACC before animals may be used
- Investigators should consult with the local ACC to ensure their research protocol meets CCAC policies and guidelines

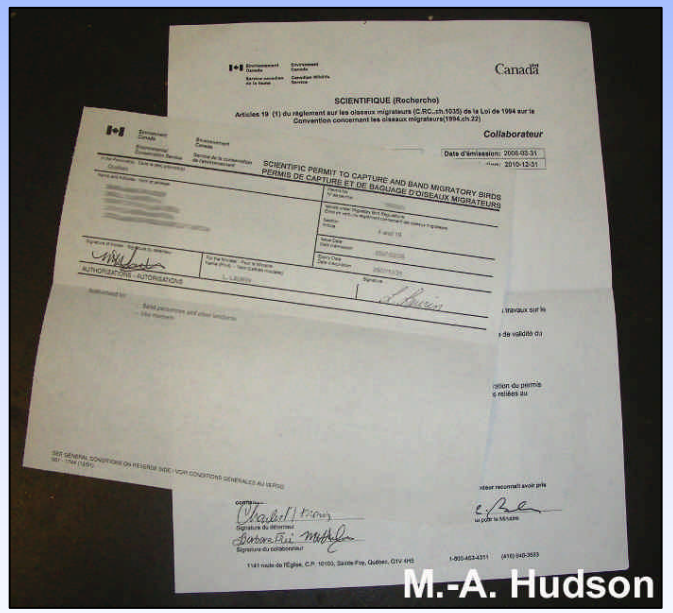
Permits and Permissions

- Institutional animal care committee approval
- Federal permits
- Provincial/territorial permits
- Band Council permission
- Landowner permission
- Veterinary drug permit
- Lab biosafety permit



Federal Permits

- Canadian Wildlife Service (CWS)
  - Scientific Permits
  - Species at Risk Permit
  - Access to Federal Lands
  - Hunting Permit
  - CITES Permit
  - WAPPRIITA
- National Parks
- Industry Canada
- Canadian Nuclear Safety Commission



Key Points in Planning a Study

- Bird safety should be of the highest priority
  - researchers should be prepared to abandon the study if adverse conditions arise
- Knowledge of study species
- Consultation with a veterinarian or other experts
- Inclusion of a pilot study whenever necessary
- Use of the least invasive practice possible
- Minimization of disturbance to animals and habitat
- Measures to prevent detrimental effects on the population

Key Points in Planning a Study

- Maximize information obtained and reduce impact on individual
- Know and minimize causes of stress or discomfort; a distressed animal provides poor data
  - Weather
  - Predators
  - Restraint
  - Short-term holding
  - Disease

Capture

- Knowledge of species
  - Moult
  - Behaviour
  - Time of day
- Minimizing stress and injury
  - Correct mesh size
  - No sharp edges
  - Safe and easy to use
  - Non-destructive to vegetation
- Evaluation of trapping method and planned endpoints

Capture

- Mist nets
  - Permits and extensive training required
  - Inappropriate mesh size can lead to injury
  - Safely dealing with accidental trapping and equipment
  - Knowledge of limitations (personnel and location)
  - Minimal, safe holding after extraction

Capture

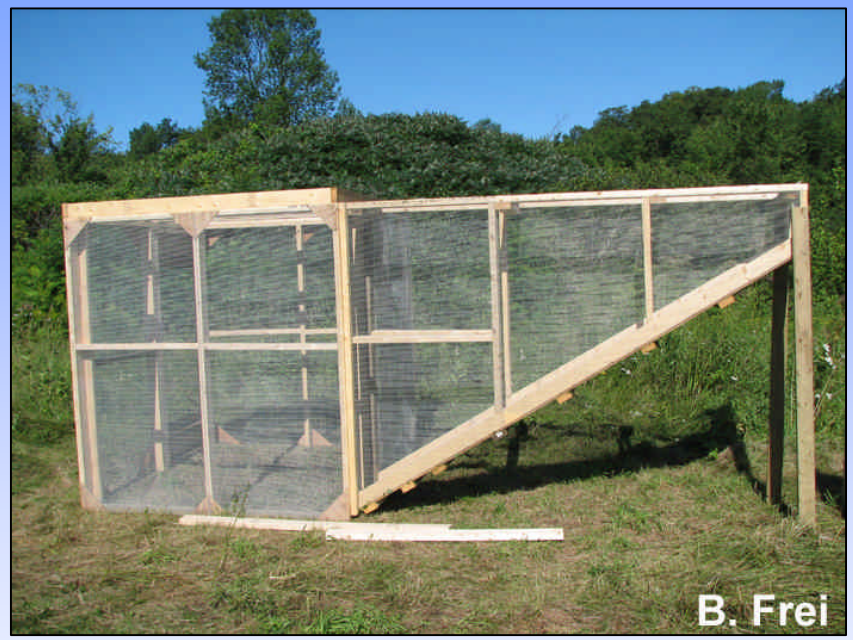
- Various methods
  - Dip net, floating mist-net
  - Bal-chatri
  - Dho-ghaza
  - Bow trap

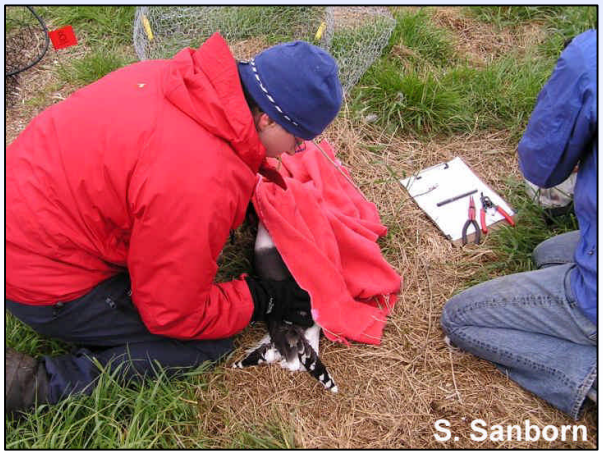
  } live animal lures

  - Net gun, cannon net, heli net, rocket net

Capture

- J-trap or heligoland trap
- Ground trap
- Capture at the nest
- Nest box traps





Restraint

- Knowledge of anatomy
- Different holds for different species
  - Wing wrap
  - Body grip
  - Photographer's grip
  - Bander's grip
  - Ice cream cone grip
- Chemical restraint

Health Evaluation

- Aspects to consider
  - Respiration rate
  - Feather condition
  - Messy vent
  - Pectoral muscle mass
  - Cardiac function
  - Capture myopathy

Bird Banding and Marking

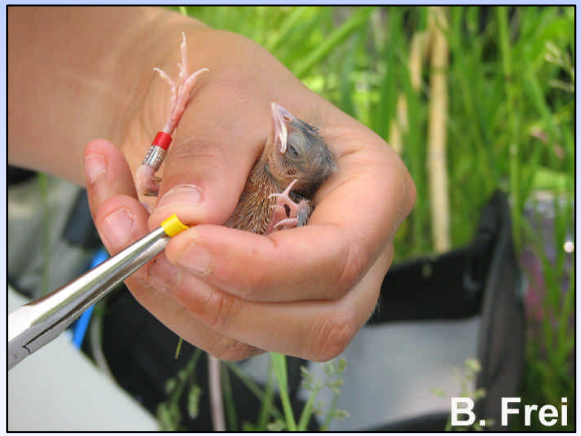
- Requires a federal permit
- Uniquely coded metal bands issued by the Bird Banding Office
- Auxiliary marker use requires authorization on the permit
- Training and resources
  - One-on-one training
  - Workshops
  - Bander training guides
  - Memo to banders
  - Bird Banding Manual

North American Banding Council

- NABC
  - Promotes sound and ethical banding practices
  - Sets standards of knowledge and skill for banders and trainers
  - Promotes competence in all aspects of banding, including bird capture, handling, identification, aging, sexing, banding, biometrics, research design, and data collection
- Log onto the NABC website for:
  - Training and certification sessions
  - Tools for training workshops
  - Educational materials for self study
- Contact the Bird Banding Office for training guides

Marking

- All marking requires a capture and banding permit
- Considerations for choosing a marking method:
  - Species biology, ecology and behaviour
  - Purpose of the study – individual or cohort marking
  - Coordination with other studies
  - Length of research
  - Possibility of pain



- Potential for injury and/or pain if improperly done

Marking

Marking

- Transmitters and electronic tags
  - Shape and size (<5% body mass, including battery)
  - Attachment
    - Harness, glue or surgery
  - Permits

Medical and Surgical Procedures

- Tissue sampling
  - Feather collection
  - Cloacal and choanal swabs
  - Buccal swabs
  - Tracheal/oropharyngeal swabs
  - Blood sampling

Medical and Surgical Procedures

- Blood sampling
  - Volume
    - 1% of body weight, <2% over 2 weeks
  - Site
    - Jugular
    - Wing
    - Medial-metatarsal

Medical and Surgical Procedures

- Ligatures and emetics
  - Used for food collection
  - Only used if strictly necessary
- Laparotomies
  - Strongly discouraged unless strictly necessary
  - DNA from feathers for sexing is preferable
    - Less invasive
    - Samples can also be used for isotope analysis

Medical and Surgical Procedures

- Surgeries or procedures that penetrate or expose a body cavity require appropriate veterinary supervision
- Birds are prone to complications from anaesthetics
- Investigators are responsible for maintaining a log of drug use and security procedures in relation to controlled substances

Short-term Housing

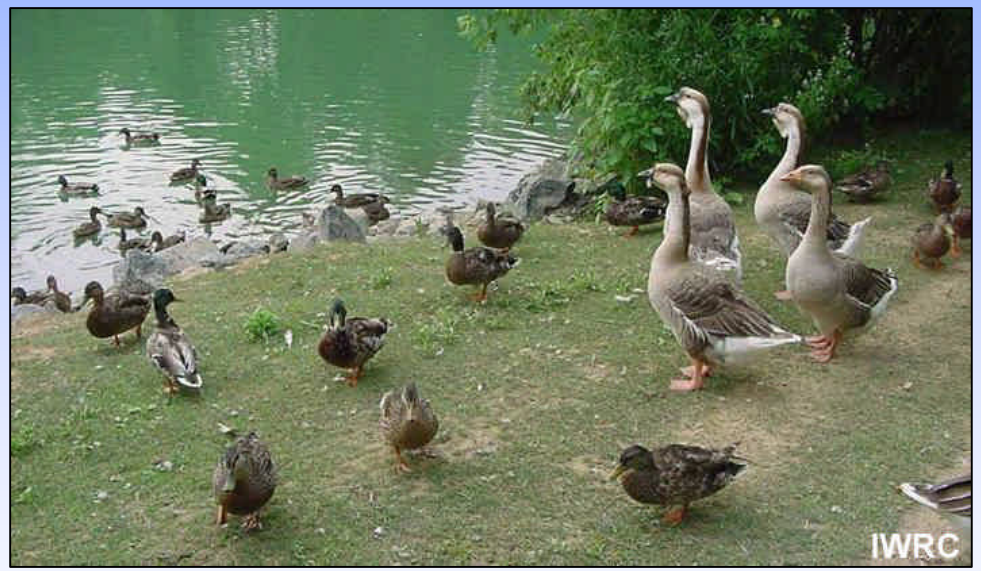
- Species-specific requirements
  - Food
  - Water
  - Environment
  - Safety
- Holding permit required if longer than 24 hours
  - See CCAC guidelines for long-term housing, as this exceeds the scope of this introductory module

Transportation

- Transportation requires a federal migratory bird transport permit
- Birds should be transported soon after capture
- IATA *Live Animal Regulations* should be consulted

Release

- Criteria for release:
  - Weight
  - Age
  - Waterproofing
  - Acclimation
  - Injuries/disease
  - Weather
  - Predators
  - Carrying capacity of release site
  - Environmental impact



Euthanasia

- Possibility must be considered and planned for
- Criteria for humane euthanasia
  - Above all minimize pain, suffering and distress
  - Method is reliable, predictable, easy and safe
  - Minimal stress on animal, investigator, and onlookers
  - Method will not impact study endpoints or environment
  - Carried out in isolation
- Technique may depend on provincial or territorial legislation

Euthanasia in the Field

- Methods
  - Physical methods
    - Blunt force
    - Cervical dislocation for small birds
    - Decapitation
    - Gunshot
  - Pharmaceutical methods
    - Injectable pharmaceuticals
    - Volatile anaesthetics
- Ensure safe disposal
  - Avoid introduction of drugs into the environment

Human Safety Considerations

- Physical risks
  - Beaks
  - Talons
  - Insect bites
- Chemical risks
  - Restraining agents
  - Disinfectants
  - Marking agents
- Proper training

Human Safety Considerations

- Potential zoonoses
  - Secondarily transmitted from birds to humans
- Biosafety/biohazards
  - Physical considerations
  - Disease transmission vectors
- Other hazards
  - Weather
  - Equipment

Practical Training

- Where to get training?
  - Recognised experts
  - Bird-banding observatories
  - Universities
  - North American Banding Council
  - International Wildlife Rehab Council
  - Canadian Association of Zoo & Wildlife Veterinarians

Acknowledgements

This module was developed by Lynn Miller and Marie-Anne Hudson, funded by a grant from the Canadian Council on Animal Care and coordinated by Lesley Howes of the Canadian Wildlife Service.

Thank you to all who reviewed previous drafts of this document and to the many photographers who contributed photographs.

Reference Handout