Capture and Processing Birds

Rick Lanctot
MIGRATE Workshop
Mazatlán, Mexico
16-19 March 2009
General Outline

• Capture Techniques
• Processing of birds
  – Banding
  – Aging, Sexing
  – Measurements
  – Fat, Muscle scoring
  – Moult
  – Blood collection
Capture Techniques

- Relies on knowing where birds will be in space and time
- Requires creativity and patience
- Requires you talk with many people and learn from their mistakes and efforts
Cannon Net
Double clap-net used in late summer, with decoys.

Closing net, pulled by the catcher in the background.
Chinese Clap Trap
Ottenby walk-in trap
Ottenby walk-in trap

Narrow beach
Higher vegetation, avoided by shorebirds
Broad beach, without clear leading lines

Water
Bow Net for capturing nesting birds
Setting a bownet

trap set (top view)

trap sprung (side view)

step 4 (thinner wire) semicircle

trap sprung (top view)
Nest walk-in trap
Capturing brood-rearing adults using chicks as bait
Mist Nets
Horizontal mist nets
Drive Trapping
Night-lighting
Drop traps

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Banding of Animals

- Factors to consider?
  - Why are you banding the birds? What are your objectives? Are they realistic?
  - Can you capture enough birds to meet your objectives?
    - Survival estimates require fairly large number of birds and at least three years of resight data
    - Some exceptions where banding data gives new insight that was not available before – migration patterns
One of 20 Buff-breast banded in Alaska was resighted in Brazil.
Three of 19 Buff-breasts banded in Paraguay were resighted in Brazil.
Extrinsic markers: color bands, leg flags, patagial markers

Resighting rates tend to be low for shorebirds, better for hunted species.

If see a banded bird, contact U.S. Geological Surveys Patuxent Wildlife Research Center’s Bird Banding Lab

http://www.pwrc.usgs.gov/bbl/
Calidris pusilla XUA kourou 061006 (7)

seen 2006 October 6th
vu le 6 octobre 2006

light green flag XUA # metal
"JJ"
Banding of Animals

• Factors to consider?
  – Why are you banding the birds? What are your objectives? Are they realistic?
  – Obtaining a permit and metal bands
    • Difficult in some Latin American countries
    • Can work through North American master banding permit holder to acquire USGS metal bands OR
    • Order metal bands from private company
    • Learn the rules for your country
Banding of Animals

• Factors to consider?
  – Why are you banding the birds? What are your objectives? Are they realistic?
  – Obtaining a permit and metal bands
  – Coordination of banding with other people working with the same species.
    • Especially important for long-lived species that leave your study area
    • Are there national or international programs in place that you need to follow?
Pan American Shorebird Program

Photo: C.L. Gratto-Trevor
Canadian Wildlife Service

Since few species of shorebirds are hunted in North America, the traditional method of marking birds with metal leg bands was not an efficient way to track shorebird movements. As a result, a method of marking shorebirds that would result in a minimal negative impact to the birds was needed. The idea of using a system of small cloth flags and their corresponding book of blank forms was developed and tested by researchers at the Canadian Wildlife Service. The Shorebird Banding Information System (SBIS) is a database of information on shorebirds that can be used by researchers to better understand shorebird movements and behavior. The system includes a set of flags and a book of blank forms that can be used to track the status of a particular shorebird population. The system is designed to be user-friendly and easy to use, and it can be used by researchers to track the status of a particular shorebird population.
<table>
<thead>
<tr>
<th>Master</th>
<th>Lower</th>
<th>White</th>
<th>Black</th>
<th>Blue</th>
<th>Green</th>
<th>Orange</th>
<th>Yellow</th>
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|        |       |       |       |      |       |        |        |

| North Island | White | Delay Use | Shanghai | Black | White | White | White | White | White |
| NEW ZEALAND         |       |           |       |       |       |       |       |       |       |

| Black |       |       |       |      |       |        |        |
|       |       |       |       |      |       |        |        |

| Yellow band | Dark Green flag | Alaska | USA |
|             |                 |       |     |

| Blue |       |       |       |      |       |        |        |
|      |       |       |       |      |       |        |        |

| Dark Green flag | Yellow band | Alaska | USA |
|                 |             |       |     |

| Green |       |       |       |      |       |        |        |
|       |       |       |       |      |       |        |        |

| Pale Blue | nothing | N Chukotka | RUSSIA |
|           |         |            |       |

| Orange |       |       |       |      |       |        |        |
|        |       |       |       |      |       |        |        |

| Pale Green | nothing | S Chukotka | RUSSIA |
|            |          |            |       |

| Yellow |       |       |       |      |       |        |        |
|       |       |       |       |      |       |        |        |

| doug.watkins@wetlands-oceania.org |

**Colour Flag Combinations for Migration Research on Shorebirds in the East Asian - Australasian Flyway**

24/06/2007

**KEY:** Provisional/Available | Discontinued
Solder bands
Banding of Animals

• Factors to consider?
  – Why are you banding the birds? What are your objectives? Are they realistic?
  – Obtaining a permit and metal bands
  – Coordination of banding with other people working with the same species.
  – What type of bands/markers to use?
    • Do you need to actually mark the bird?
    • Do you need to individually identify each bird?
Bird Bands
Enamel Paint may be better.
Unique color bands identify individuals.
Unique engraved flag identifies bird
<table>
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<td>A</td>
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<td>B</td>
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<tr>
<td>C</td>
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<td>O</td>
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<tr>
<td>K</td>
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<td>Q</td>
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<td></td>
<td>X, H and N</td>
<td>Caution reversible if used with 1,6,9,0</td>
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</tr>
<tr>
<td>Total</td>
<td>Total</td>
<td>Total = 11</td>
<td>Suggestion: do not use E / F or M / N in the same series or code year</td>
<td></td>
</tr>
</tbody>
</table>

Cohort banding

Red

Orange

Yellow/green flag

Yellow/green flag chick in Japan
Take pictures of data book and bird.
Banding of Animals

• Factors to consider?
  – Why are you banding the birds? What are your objectives? Are they realistic?
  – Obtaining a permit and metal bands
  – Coordination of banding with other people working with the same species.
  – What type of bands/markers to use?
  – Must determine band combinations and where to place bands
    • Random application to birds
Alaskan Dunlin breeding and wintering areas - Case study where banding was effective.

Southward migration of C. a. arcticola, August-October

Southward migration of C. a. pacifica, August-October
Alaska Marked Bird Resightings in Asia

- Alaska birds have been resighted primarily in Japan and Taiwan.
- Few observers in other countries.
- Recoveries of AK-banded birds in Sakhalin (all in Aug-Nov) suggest _arcticola_ dunlin migrate southwards via the Sea of Okhotsk.
Marked Bird Resightings in Alaska

- Dunlin banded in China, Taiwan and Japan have been seen in Alaska.
Aging and Sexing Individuals

AHY Male Buff-breasted Sandpiper

Hatch Year Buff-breasted Sandpiper

AHY Female Buff-breasted Sandpiper
Sexing Dimorphic species

AHY Male Pectoral Sandpiper

AHY Female Pectoral Sandpiper

Various measurements also are useful for separating sexes in many species.

But are there faeders (intermediate-sized birds) like in the ruff?
Morphology Measurements

Bairlein et al. 1994
Measuring wing of Semipalmated Sandpiper
Measuring the culmen of a Long-billed Dowitcher
Weighing birds
Helgoland

O. o. oenanthe
Norwegians

body mass/wing length (g/mm)

time (pentade, month)

April

May

June

O. o. leucorhoa
Greenlanders

body mass/wing length (g/mm)

time (pentade, month)
Fat Deposition

Bairlein et al. 1994
Extremely fat birds occur!
Moult

Plumages: succession

1. Natal down
   → prejuvenal molt
2. Juvenal pennaceous plumage
   → First prebasic molt
3. Basic I plumage
   → First prealternate molt
4. Alternate I plumage
   → Second prebasic molt
5. Basic II plumage
   → Second prealternate molt
6. Alternate II plumage
Feather Growth Scoring

tiny primary 11
Alula
Lesser coverts
Primary coverts
Median coverts
10
Primaries
1 1
Secondaries
10
Greater coverts
Scapulars
Tertials
Primaries

- *Most* birds have 10
- Storks, Rheas, Grebes, Flamingos have 11
- Ostriches have 16
- Some songbirds have 9
- Kiwis have 3-4

Secondaries

- 6 in hummingbirds
- 40 in albatrosses
**Calidris**: a diversity of moult strategies

<table>
<thead>
<tr>
<th>Pre-migration moult</th>
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<td><img src="image" alt="C. ptilocnemis" /></td>
<td><img src="image" alt="C. maritima" /></td>
<td><img src="image" alt="C. melanotos" /></td>
</tr>
</tbody>
</table>

*Diversity among species AND within species*

Courtesy of Sam Franks
• **Moult progression**
  – individual feathers 0 (old) to 5 (new)
  – total 0 (all old) to 100 (moult complete) for species with 10 feathers

• **Flight feather condition**
  – scale of 0-4

• **Change in moult status**
Moult Progression

![Least sandpiper](image)

Date

01-Jul  15-Jul  29-Jul  12-Aug  26-Aug  09-Sep  23-Sep

Moult progress (moult score)

0  20  40  60  80  100  200

2006  n = 98
2007  n = 337

Courtesy of Sam Franks and Dov Lank
Body Molt
Collect Feathers

- For stable isotope analysis requires knowledge of where feathers are grown (at least for some birds)
- Can clip ends of feathers (but be consistent), or pull entire feathers (these will be regrown)
- Try to avoid pulling flight feathers if birds are preparing to migrate
Take pictures.
Collection of Blood

• Used primarily for 1) genetic analysis (sexing, paternity, population structure, phylogeography) 2) reproductive or stress hormones, 3) measure metabolic fuels, 4) local stable isotope signature, 5) examine immune function, and 6) track emerging infectious diseases.

• Method depends on amount of blood needed. Alternatives may be available: mouth swabs for DNA, toe clips, feathers for DNA and isotopes.

BASILIC (CUTANEOUS ULNAR; “WING”) VEIN
MEDIAL METATARSAL VEIN

- Gastrocnemius, medial head
- Tarsal canalis
- Flexor digitorum longus

MEDIAL METATARSAL VEIN

- Extensor retinaculum
- Cruciate tibial artery
- Extensor hallucis longus muscle
- Dorsal metatarsal artery
- Extensor hallucis longus tendon
- Extensor digitorum longus tendon
- Abductor digiti II
10 June 15 June 20 June 25 June

Frequency

Monogamy
Multiple-maternity
Multiple-paternity

Nest Initiation Date

Monogamy
Multiple-maternity
Multiple-paternity

Nest Initiation Date

June

10 15 June 20 June 25 June

Frequency

Nest Initiation Date

June

10 15 June 20 June 25 June

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10 15 June 20 June 25 June

Frequency

Nest Initiation Date

June

10 15 June 20 June 25 June

Frequency

Nest Initiation Date

June
Heavy birds have lower cort levels. Cort levels highest in arrival > egg laying > inc > chick.
Processing birds

• Things to consider
  – How accurately can the birds be measured? Aged? Sexed?
    • How much variation is there from person to person in obtaining data?
  – What parameters are most useful?
  – How much time do you have?
  – What should you do if the bird is injured or becomes stressed out?
  – Be organized and prepared.
Banding alone
Banding together