DoD and Coordinated Bird Monitoring (CBM)
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Introduction

➢ Work by the bird initiatives, especially landbirds and shorebirds, NABCI, IAFWA, and many organizations involved with bird monitoring

➢ Effort to increase efficiency and utility of bird monitoring through improved coordination:
  • Between the initiatives
  • Between field workers and statisticians
  • Between decision-makers and technical experts
Introduction

- Vision: that monitoring be management-driven, science-based, scale-dependent, and implemented through partnerships.
- CBM is a movement and an approach
- No authority to compel anyone to do anything; just a bunch of advice
History

- Started by Partners in Flight in late 1990s in the western US
- Expanded throughout the US, and some of Canada, during the past 2-3 years
History (cont’d)

- State CBM plans completed for two States and underway for 8-10 others
- Work in the shorebird and landbirds initiatives is continuing
- IAFWA CBM Committee just completing report
- Plans being made to implement its recommendations
Today’s Presentation

- Provide summary of recent and planned CBM work.
- Suggest ways it might be useful to DoD.
Overview

- Use a Goals-Objectives-Strategies approach
- Will discuss work on each phase
- Provide advice for short- and long-term projects
Two General Principles

- Monitoring design should be based on management needs.

- Coordination should occur at the scale of the management issue.
Goals: Short-term projects

➢ Nevada
  - Importance of juniper to birds in NV
  - Success of riparian restoration projects
  - Models predicting effect of water levels

➢ Mid-Atlantic States
  - Effectiveness of ROW management
  - Importance of stop-over habitat for landbirds
  - Black rail population size
# Goals: Coordination

<table>
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<tr>
<th>Management Issue</th>
<th>NJ</th>
<th>DE</th>
<th>MD</th>
<th>NY</th>
<th>CT</th>
<th>VA</th>
<th>PA</th>
<th>Selected?</th>
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<td>X</td>
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<td>X</td>
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<tr>
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<td></td>
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<td></td>
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<tr>
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<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>
Goals: Long-term projects

- Many goals, some not well known initially
  - National Petroleum Reserve of Alaska
  - Use of Breeding Bird Survey data
    - research articles
    - estimating population size
Goals: Long-term projects

- Determine whether species of special concern need additional protection.
- Determine causes of declines and ways to reverse them.
- Identify critical habitats for species of special concern.
- Determine the conditions required for viable populations.
- Identify areas of highest priority for acquisition or restoration.
- Set habitat objectives by species, region, and season.
- Evaluate and refine large-scale conservation efforts.
Objectives

- Biological population
  - Focal species
  - Study area
  - Study period

- Information needed

- Quantitative objectives
  - Parameters
  - Accuracy target for each
Objectives: Short-term projects

- **Common products**
  - Population size or change in size
  - Demographic rate(s)
  - Habitat relationships

- **Examples from the Nevada CBM Plan**
  - Population size in juniper (cv < 0.2)
  - Chg in pop’n size in riparian areas (power)
  - Regr. coef. for wetlands model (cv<0.5)
Objectives: Long-term projects

- Work by landbird and shorebird initiatives
- Goal for abundance monitoring
  - 80% power to detect a 50% decline occurring during no more than 20 years using a two-tailed test...
- Work needed for population size, ...
Strategies:
“Design of Bird Surveys”

- Introduction
- Reasons to Survey Bird Populations
- Major Components of the Monitoring Plan
  - Management Issues Addressed
  - Monitoring Objectives
  - Strategies
- Survey Design
  - Components of Accuracy
  - Index methods
  - Double Sampling
  - Habitat Information
  - Procedures for Aquatic Areas
- Estimating Trends
- Estimating Abundance
- Estimating Demographic Rates
- Specific Surveys
- Literature Cited
Design of Bird Surveys (cont’d)

- Survey Types: Point counts, area searches, migration counts, aerial surveys, nest success, ...
- Topics: Parameter definition, sampling plans, field methods, potential bias, power and sample size formulas, point and interval estimates.
- Orientation: quantitative
Strategies: short-term projects

- “Guidelines from Short-term Projects”
  - Brief description
  - Statistical population
  - Sampling plan
  - Training and field methods
  - Sample size requirements
  - Analytic methods
  - Data management
  - Reports

- Examples from Nevada, Idaho, mid-Atlantic states
Needed long-term surveys for non-game birds

- BBS and similar programs
- Migration monitoring (landbirds)
- Wetland bird surveys (year round)
  - aerial surveys
  - ground-based, diurnal surveys (productivity, abundance)
  - secretive marshbird surveys
- Winter surveys
- Demographic surveys (breeding landbirds)
- Nocturnal landbird surveys
- Colony surveys
- Other surveys
Data Management
(long-term surveys)

- Agree on methods (so data are similar)
- Central repositories to extent feasible
  - Input via the internet
  - Data freely available to all (except sensitive data)
- Internet-based data network
  - Agree on core variables
  - Data providers write scripts to extract these variables
  - Internet-based program accesses these scripts
- Front-end, user-friendly programs for analysis
Program for Regional and International Shorebird Monitoring (PRISM)

Canadian Shorebird Conservation Plan
U.S. Shorebird Conservation Plan
Four-part Approach

- Arctic / boreal breeding surveys - 34 species
- Temperate breeding surveys - 17 species
- Temperate nonbreeding surveys - 38 species
- Neotropical surveys - 14 species
Sample stratification of a primary unit

dot = a cluster of plots
Example of a Plot the Follows Natural Borders

Dot = randomly-selected starting point for plot
Squares = randomly (e.g., systematically) selected plots
**Estimator: the CV**

\[
CV(\hat{Y}_3) = \sum_{h=1}^{H} \left\{ \frac{1}{c_h} \left[ g_{h1} + \frac{1}{n_h} \left( g_{h2} + \frac{g_{h3}}{m_h} \right) \right] + \frac{1}{c'_h} \left[ g_{h4} + \frac{1}{n'_h} \left( g_{h5} + \frac{1}{m'_h} \left( g_{h6} + \frac{g_{h7}}{o'_h} \right) \right) \right] \right\}
\]

- \( h \) = stratum
- \( g \) = constants, independent of sample size
- \( c \) = N of crew years (e.g., 20)
- \( n \) = clusters/crew year (e.g., 9)
- \( m \) = plots per cluster (e.g., 4)
- \( n' \) = intensive clusters/crew year (e.g., 2)
- \( m' \) = intensive plots/cluster (e.g., 4)
- \( o' \) = rapid surveys/intensive plot (e.g., 1)
Estimation of the g-values

Regions and field sites
Shorebird Population and Habitat Sampling in Extensive Ephemeral Wetland Systems

Prairie Pothole Region
North and South Dakota
western Minnesota

• Identify landscapes with high probabilities of shorebird occurrence
• Develop and test an approach to monitoring
• Model shorebird abundance relative to habitat and landscape attributes and climate
Long distance migrants

Timing
Townships classified into 4 landscape types based on median wetland and cropland areas.
Random selection of townships
How CBM can help DoD

- Clarify how monitoring does or can help address management issues of importance to DoD
- Provide state-of-the art, broadly-accepted advice on survey methods
- Help develop long-term surveys of species of special concern on DoD lands
How DoD can help CBM

- Assist in developing methods and agreement on them.
- Encourage use of the “Guidelines for designing short-term projects” and help us improve it.
- Participate in the data management system where appropriate.
- Participate in long-term surveys with level of effort proportional to land base (i.e., small effort, but long-term commitment).
Header

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  - sub-titles
- titles
Header

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  - sub-titles
- titles