

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

Management Issue	NJ	DE	MD	NY	CT	VA	PA	Selected?
Forest health	X	X		X	X	X	X	Yes
Early succ'l hab.	X		X	X	X		X	Yes
Freshwater wetlds.	X	X	X	X		X	X	Yes
Migration habitat	X	X	X	X	X		X	Yes
Tidal marsh hab.		X	X	X	X	X	X	Yes
Wind power		X	X	X			X	Yes
Contaminants	X	X			X			No
End'd species	X	X						No

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

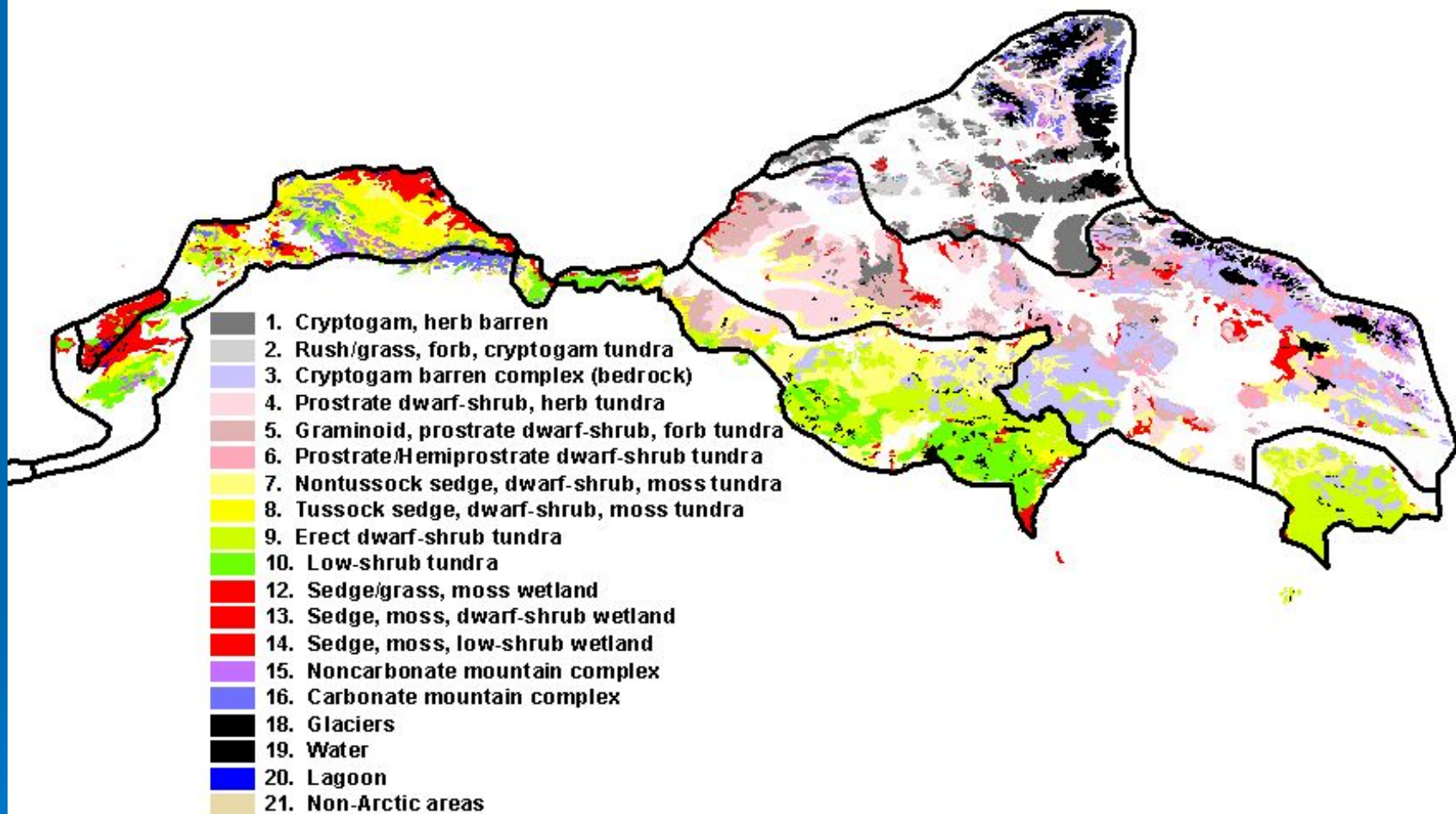
Program for Regional and International Shorebird Monitoring (PRISM)



**Canadian Shorebird Conservation Plan
U.S. Shorebird Conservation Plan**

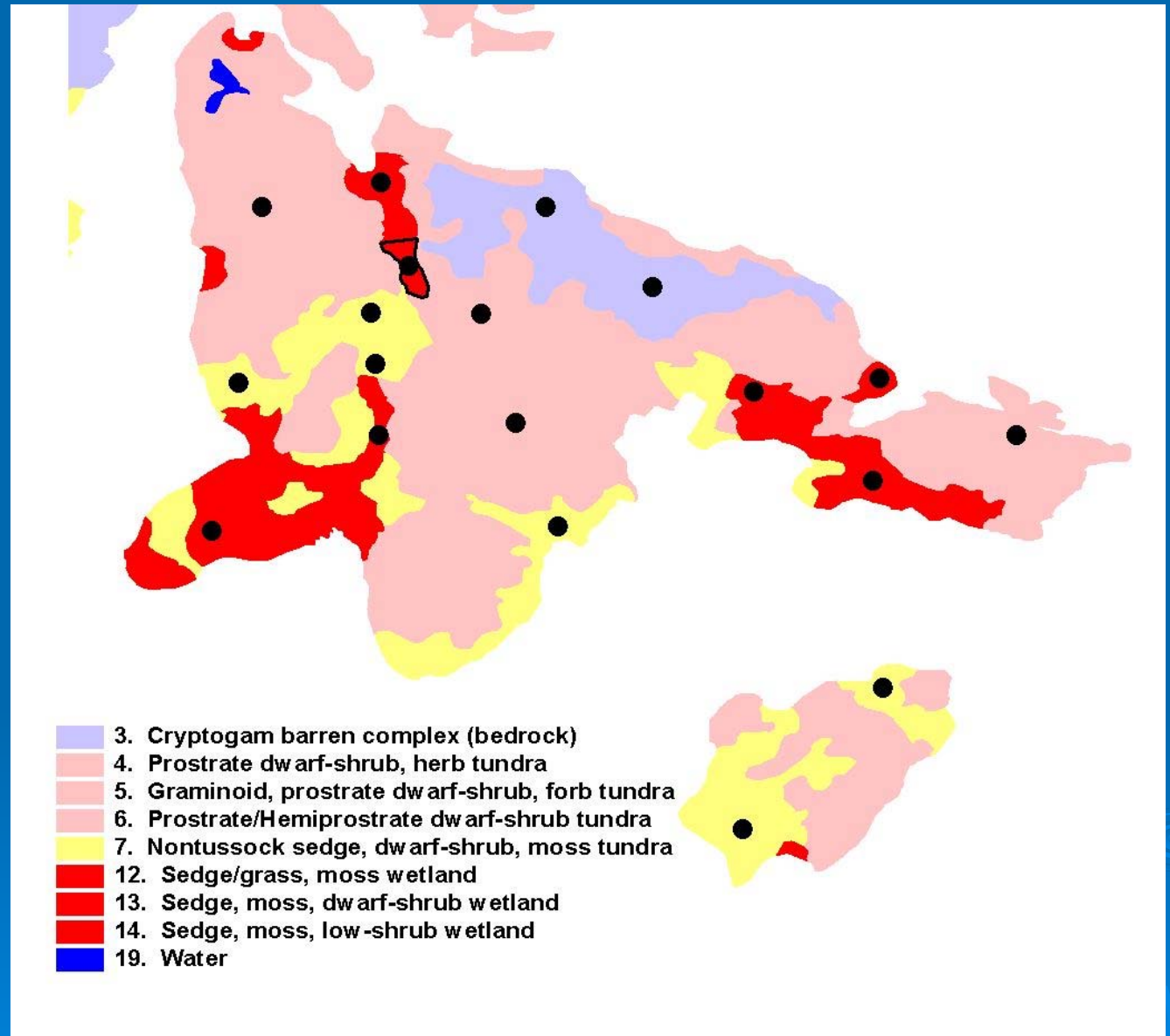
Four-part Approach

- Arctic / boreal breeding surveys - 34 species
- Temperate breeding surveys - 17 species
- Temperate nonbreeding surveys - 38 species
- Neotropical surveys - 14 species

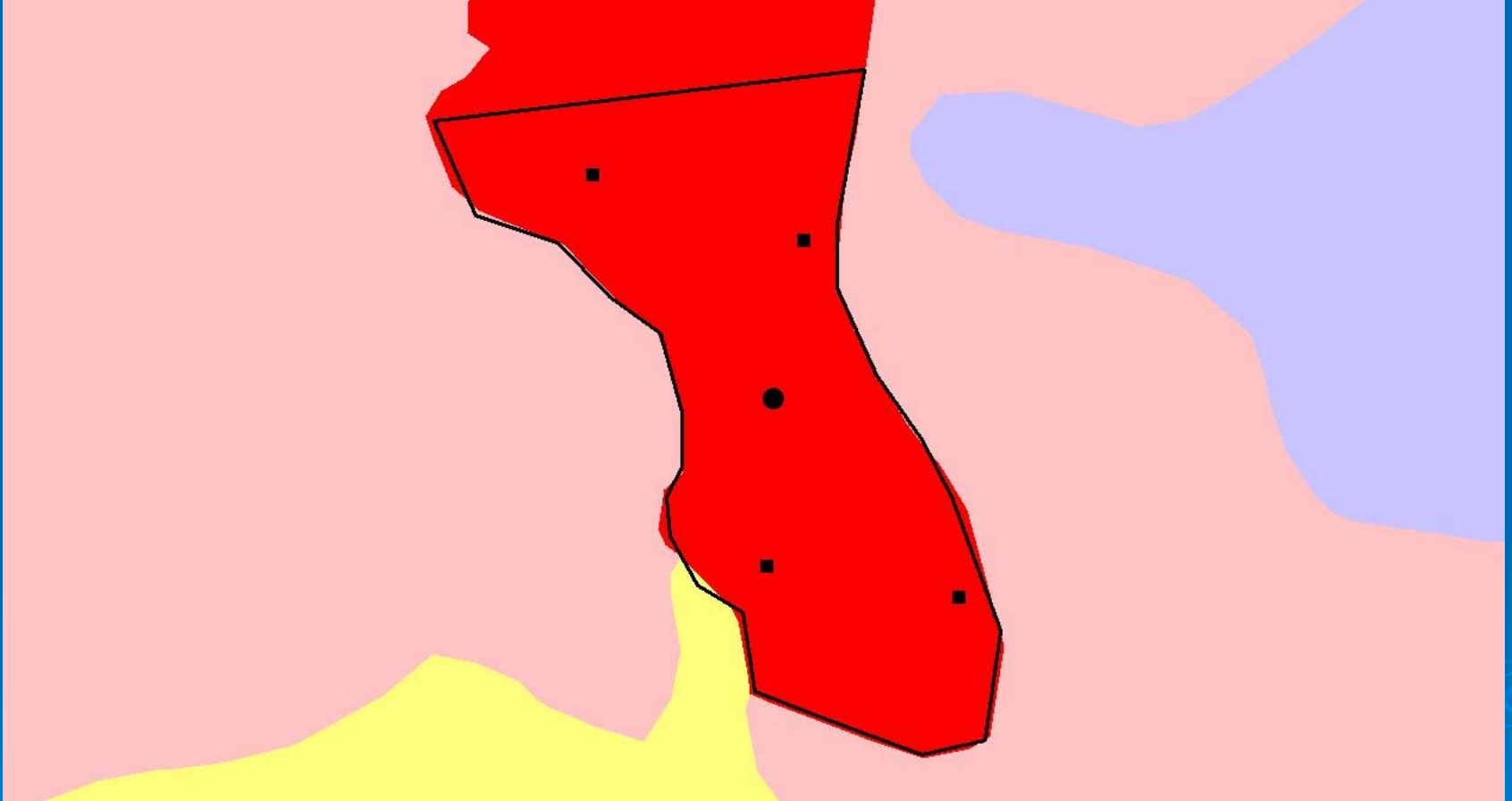


Sample stratification of a primary unit

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

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

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)

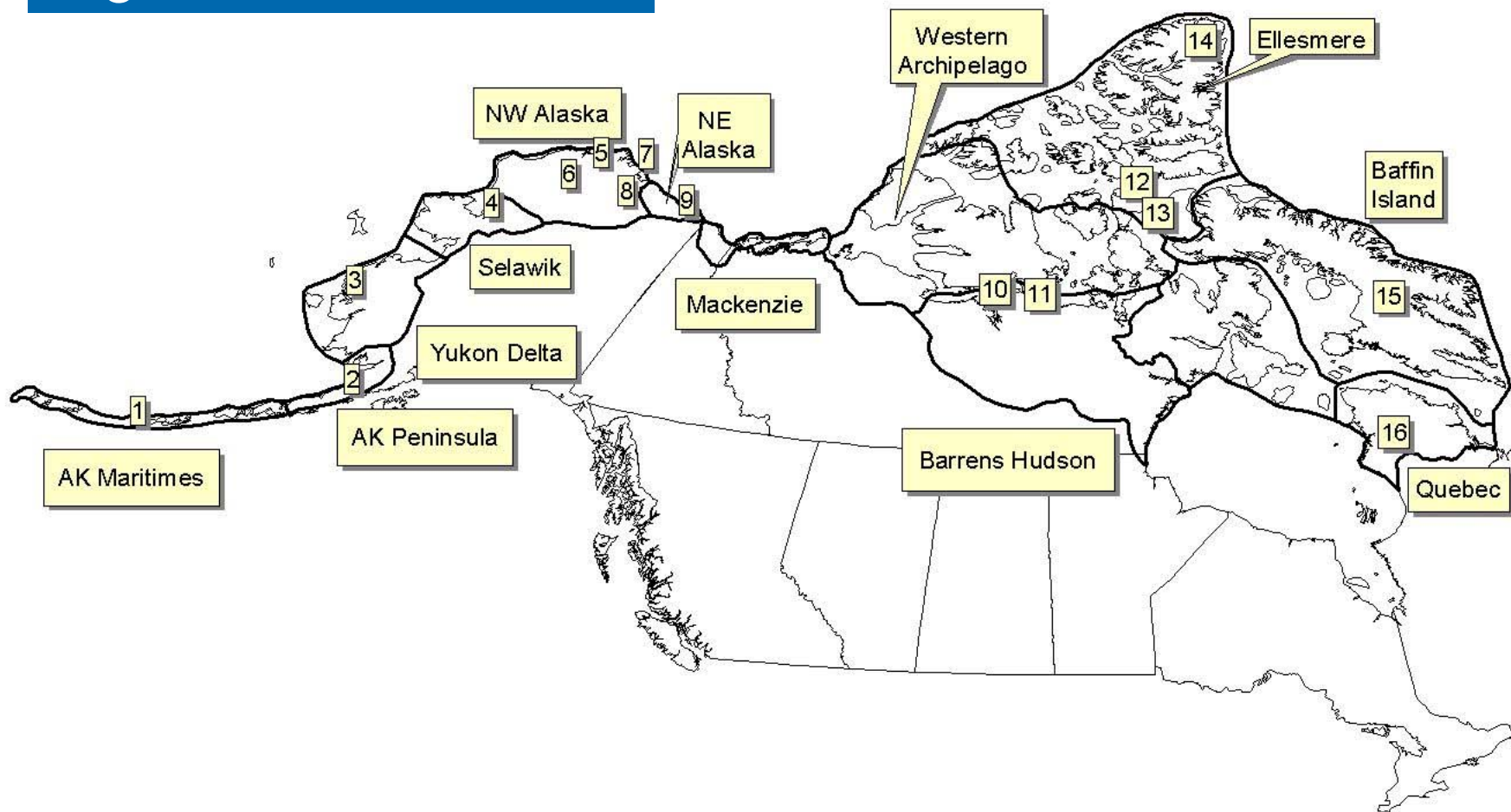
n' = intensive clusters/crew year (e.g., 2)

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

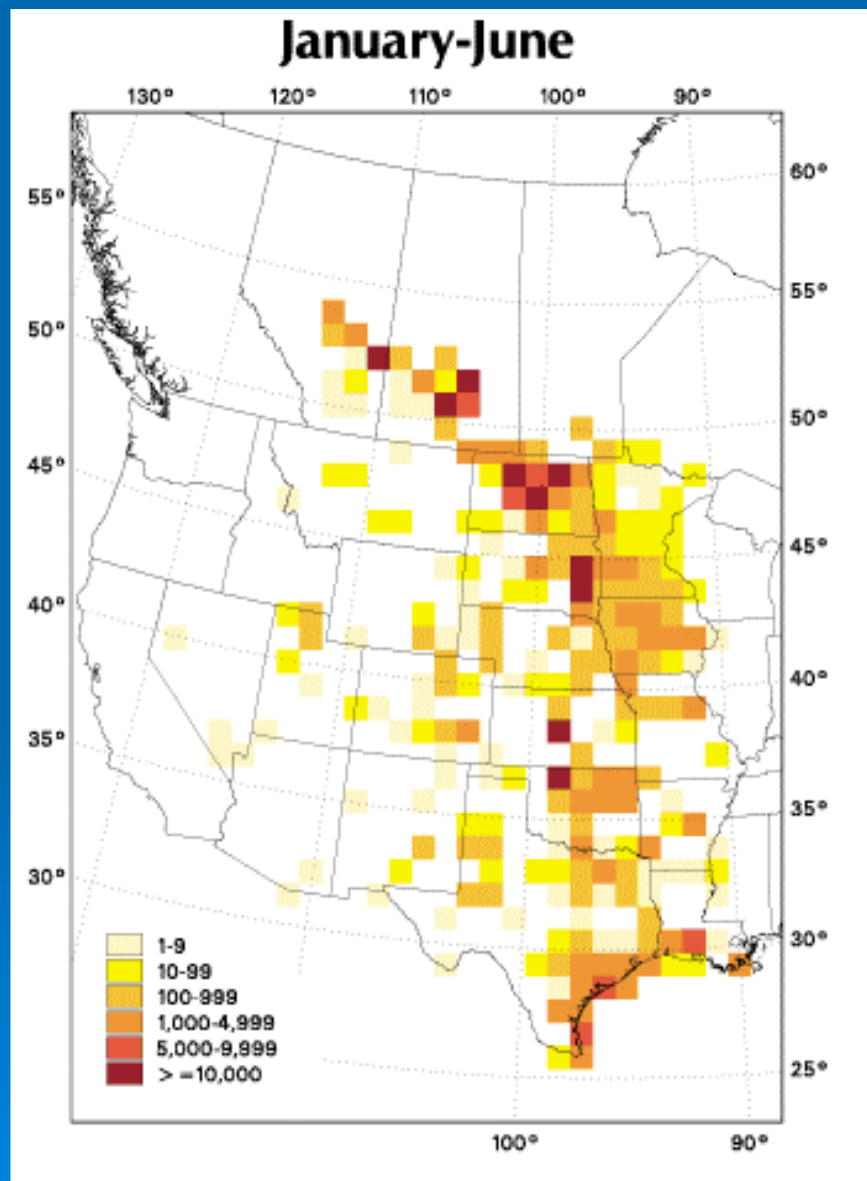
North and South Dakota
western Minnesota



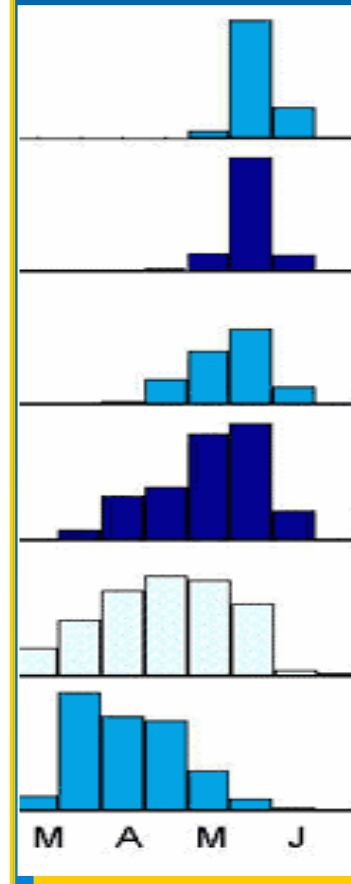
- Identify landscapes with high probabilities of shorebird occurrence
- Develop and test an approach to monitoring
- Model shorebird abundance relative to habitat and landscape attributes and climate



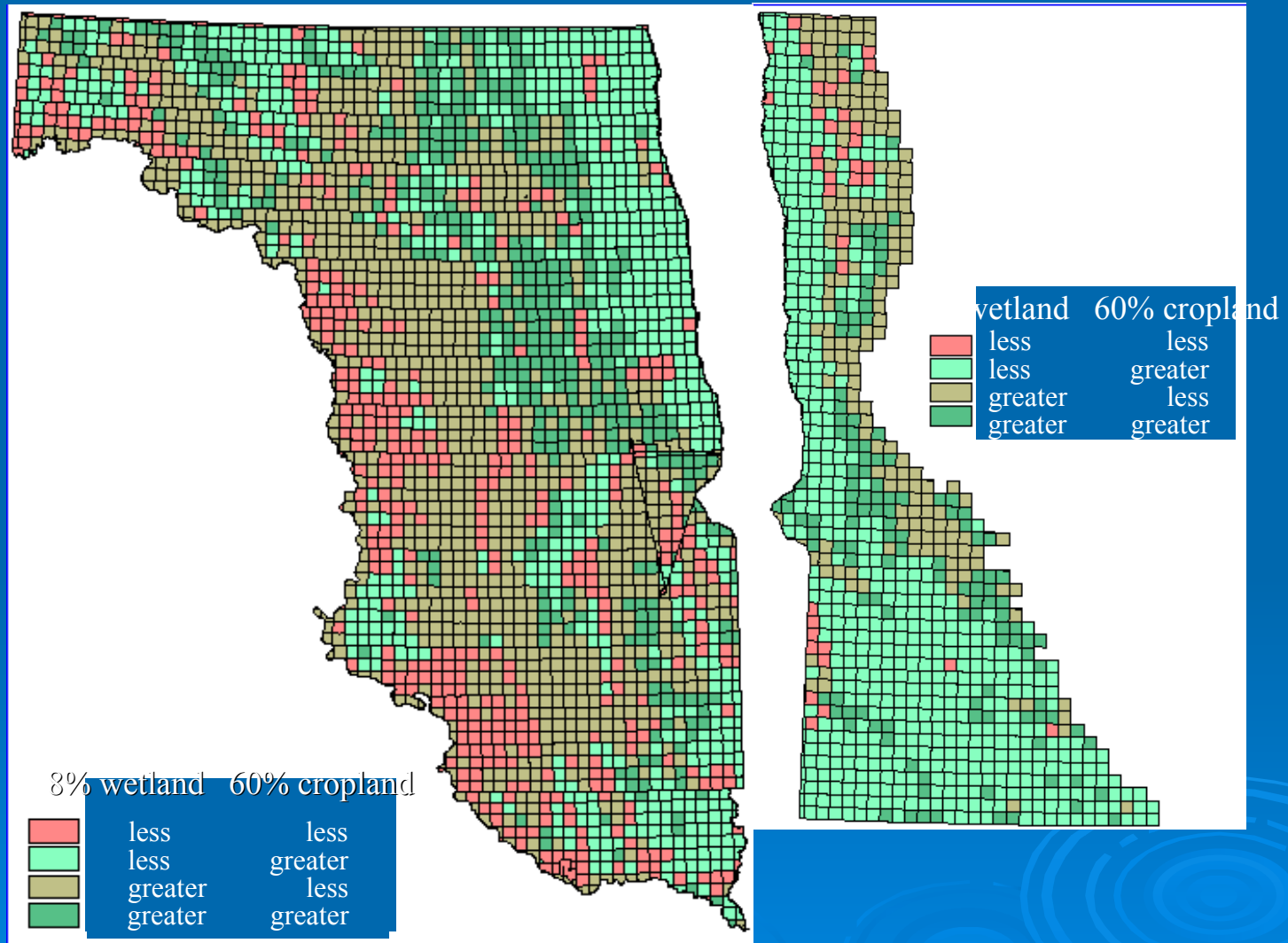
Long distance migrants



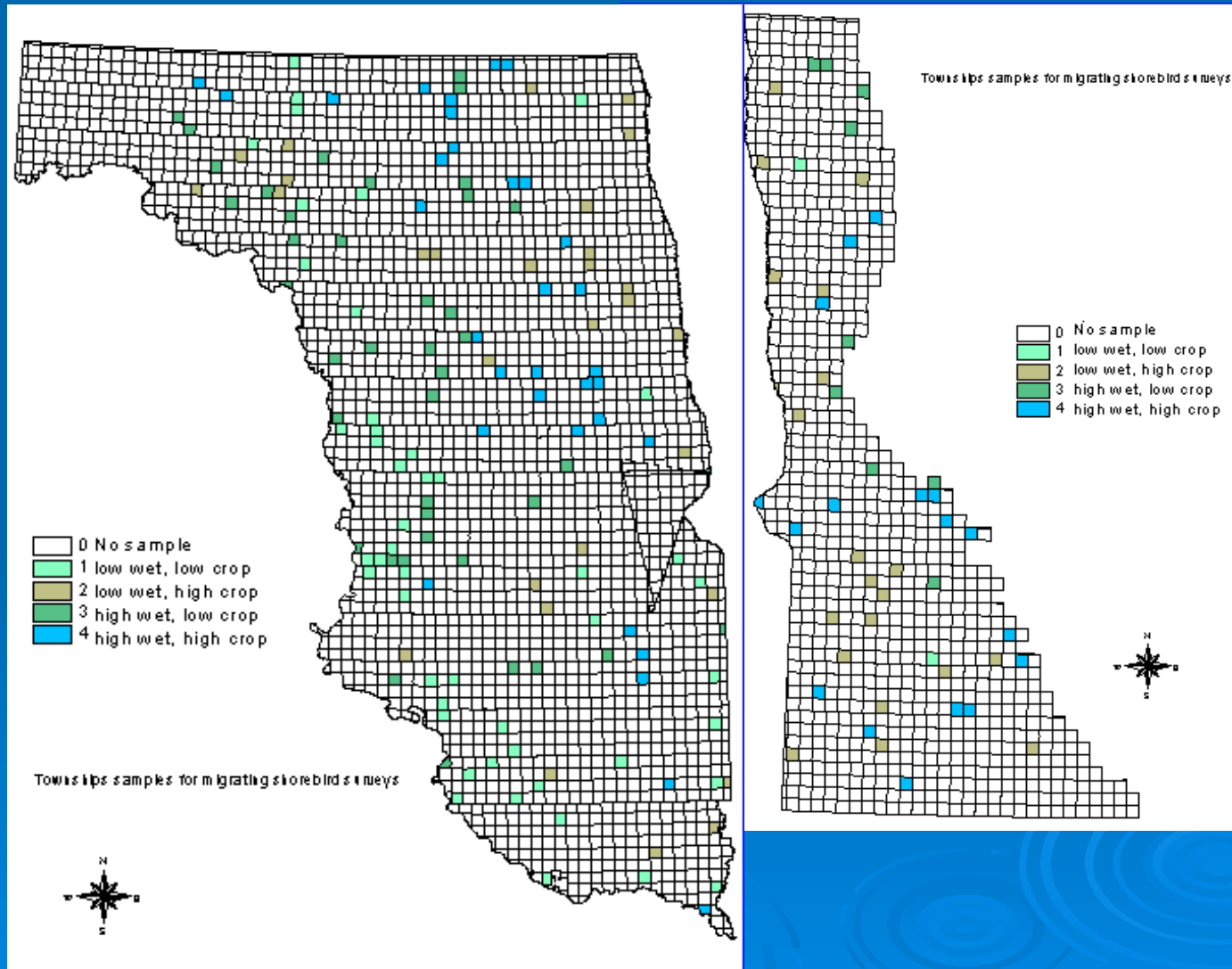
timing



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 (ie, small effort, but long-term commitment).



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