Point Count Data and Management Decisions

What **could** point count data tell us?

- Presence
- Estimate relative abundance
- Estimate trends over time
- Examine associations between birds and their habitats
- Examine effects of management practices

How?

- Presence – pretty straightforward.
- Relative abundance – can use frequency.
- Relative abundance – can use distance data to develop density estimates.
- Trends over time – collect data more than once and compare.

How?

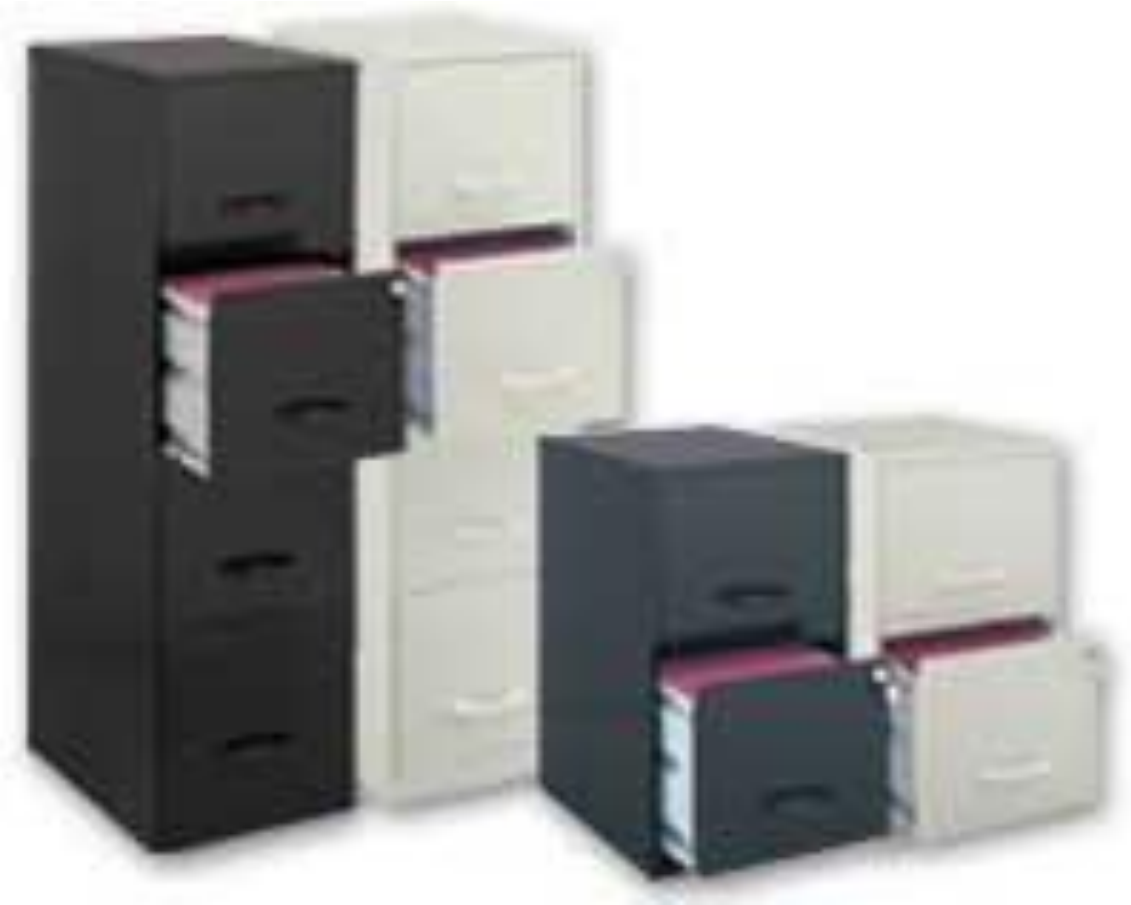
- Determine associations between birds and their habitats – conduct many point counts in the same habitat.

- Examine effects of management practices – conduct many point counts in management areas and control areas. Good for regional assessments; probably not appropriate technique at small scale.

So Who's Collecting Point Count Data?

- Land Management Agencies
  - Federal and State
    - NWRS, BLM, USFS, NPS, DOD, BOR
    - Most state wildlife agencies
- Non-governmental Organizations
  - Bird Observatories, TNC, Land Trusts, Audubon Chapters
- Researchers

What Do They Do With These Data?



Or maybe even this:

And/Or Contribute to National Databases

- Patuxent Wildlife Research Center
  - Bird Point Count Database
  - www.pwrc.usgs.gov/point/help/overview.cfm
- FS Fauna Database
- NWRS RL GIS/Geodatabase
- NPS – national database through I&M Program
- BLM – Not!

How are these data used?

- Informally – data are discussed, but their use is not documented in decision documents or plans
- Formally – data are analyzed to address specific objectives and results incorporated into documents and plans

Examples

- Formal Use – San Pedro National Riparian Area
- Dave Krueper (and others) collected bird data via transects and documented bird and vegetation responses to removal of cattle from the area.
- These data were used by BLM in their decision to not put cattle back into this riparian area and adjacent uplands.

San Pedro National Riparian Area - Before and After Photos

The data live on

- The data that Dave et al collected on the San Pedro continue to be used in other management decisions in Arizona.

Examples

- Often, point count data are collected to both establish baseline data for an area, and also to track trends over time.
- These data are rarely used in a formal way, but are frequently used informally to help guide management.

Example

- The Northeast Region of FWS collected point count data for 2-3 years to determine the composition of the breeding landbird community at each refuge.
- They use these data to help formulate goals and objectives in their Comprehensive Conservation Plans.

Example

- Klamath National Forest
- Established several hundred point count stations on one-track dirt roads throughout the forest, and collected bird and habitat data for several years.
- These data are still used in environmental assessments and project planning efforts.

Example

- Southern National Forests
- These forests have collected point count data for several years, in a coordinated, standardized way.
- These data were recently analyzed, and published.
- Forest Service General Technical Report NRS-9, June 2007

Example

- They report population trends and habitat occurrences in 14 national forests in the Southern Region from 1992-2004.
- They make no management recommendations.
- How will the FS use their results?

Example

- Lower Mississippi Valley Joint Venture coordinates point counts on refuges, national forests, and state wildlife areas in bottomland hardwood forests.
- http://lmvjv.org/population_monitoring.htm
- Recently created a database to house reforestation data.
- They hope to use these data to assess stand treatments across the ecoregion in bottomland hardwood forest.

Combining Surveys

- http://www.birds.cornell.edu/pifcapemay/sauer.htm
- Combining Information from Monitoring Programs: Complications Associated with Indices and Geographic Scale. John R. Sauer

Sauer paper

- **ABSTRACT**—To adequately monitor Neotropical migratory birds, information must be collected to assess population change at local, regional, and continentwide scales. I suggest that large-scale survey results (such as those derived from the North American Breeding Bird Survey) should not be used to predict population attributes on parks, refuges, and other protected areas. These areas are often managed, and generally contain habitats that can be poorly sampled in large scale surveys, hence local bird populations might be quite different from those sampled in the large-scale surveys. Furthermore, we are limited in our capabilities to combine information from local surveys with large-scale survey data. Most surveys of bird populations collect indices of abundance which are often not comparable among surveys due to habitat and region specific differences in probabilities of detecting birds. In assessing the effects of management, it is important to understand the limitations of monitoring at different geographic scales and to design programs to monitor at the scale at which management is conducted.

Example

- Kentucky – national forests and state wildlife areas have been conducting point counts.
- They compared their data to BBS data for the region and found different trends for some birds.
- For some forest birds, BBS data showed declines, while their data showed no declines or improving trends. Their early successional species showed declines.
- They are now using these data to more closely examine their management.

Example

- Point counts on national forests in Montana reveal importance of recently burned stands to several bird species.
- Forests are slow to incorporate info into their management plans.

Monitoring is Not Enough

- http://www.birds.cornell.edu/pifcapemay/nichols.htm
- Monitoring Is Not Enough: On the Need for a Model-based Approach to Migratory Bird Management. James D. Nichols

Nichols paper

- **ABSTRACT**—Informed management requires information about system state and about effects of potential management actions on system state. Population monitoring can provide the needed information about system state, as well as information that can be used to investigate effects of management actions. Three methods for investigating effects of management on bird populations are (1) retrospective analysis, (2) formal experimentation and constrained-design studies, and (3) adaptive management. Retrospective analyses provide weak inferences, regardless of the quality of the monitoring data. The active use of monitoring data in experimental or constrained-design studies or in adaptive management is recommended. Under both approaches, learning occurs via the comparison of estimates from the monitoring program with predictions from competing management models.

Final Thoughts

- Point count data can be used to help address many questions.
- These questions need to be decided and clearly stated up front.
- Once data are collected, they must be analyzed and provided to managers in a useable format.

Birds as Ecological Indicators

- What is an ecological indicator?
- An index about the environment.
- Indicators can tell us about the condition of the environment without having to measures all aspects of that environment.
- Example - Brown pelican population size and DDT in the environment

Ecological Indicators

- Are birds good indicators?
- Yes
  - We have a basic understanding of the general habitat features and conditions that are preferred by many bird species.
  - Relatively easy to identify and to estimate numbers
  - The most heavily studied taxonomic group of vertebrates

Ecological Indicators

- Are birds good indicators?
- And No
  - We often do not understand enough about the ecology of a species to understand how they respond to environmental conditions.
  - Populations of many species are difficult to estimate (raptors, nocturnal species, hummers)
  - Wide-ranging species may not be good indicator for local or regional effects.

Ecological Indicators

- Can be used at different scales - local, regional, and global are typical scales.
- Local - look at management practices
- Regional - look at the integrity of regional populations over many landowners - like BBS
- Global - long-term persistence of a species

Ecological Indicators

- Questions to consider when identifying useful indicators for local effects
  - Does a close, documented relationship exist between the species and environmental features in which you are interested?
  - Can populations of the indicator species be measured with reasonable accuracy and precision?

Ecological Indicators

- What is the most appropriate parameter to measure: population level, reproductive output/fitness, or behavior?
- When considering using a group of species as a single indicator, do those species respond in a similar way to habitat characteristics or change?

Using Birds as Indicators

- Caution must be exercised - extrapolating information from an indicator to other species must be done with care.
- For local management - the most effective approach would be to develop indices from local information, such as patterns of habitat use and measured response to past vegetative and hydrologic manipulations.