PROCEEDINGS OF THE NORAC SIXTH BREEDING BIRD ATLAS CONFERENCE

Cornell University, Ithaca, NY

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Minutes (from the combined notes of S. Laughlin and C. Foss, not to be construed as a complete record)

Contents

WELCOMING REMARKS

Chandler Robbins

This is a landmark meeting, being the sixth time this group has convened. At the first conference, no North American atlas had been published, and the group was struggling with many basic decisions now long-since implemented. Many atlases are now completed and we have learned a great deal since the first meeting.

In the second round of atlasing, we will not merely be repeating what we did before. Many new technologies are available, and our current decisions will involve how to take advantage of them to do the best job for the future. We have opportunities to share newly developed software, methods for collecting data, and approaches to using data, and to combine data across different states and projects. The early concerns about access to data are now an old problem and an old-fashioned approach, and we need to think of effective ways to share data.

I am full of enthusiasm for the next round of atlasing. By working together and sharing ideas we can create an excellent future for atlases, which have become major ornithological works.

SECOND GENERATION ATLASES

Chair: Dr. Charles Francis

REPEAT ATLASES IN EUROPE: OVERVIEW

Chan Robbins

The Atlas of European Birds lists all available European atlases.

Europe is again leading the way with second generation atlasing. (Chan had brought copies of The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991, and of the new EBCC book. Each country did their atlases independently using their own methods; the EBCC shows the results across Europe.

Many people in Europe have been thinking about how to improve atlas projects and have developed a number of new approaches.

The new Dutch atlas has separate maps for every month of the year, with estimates of population for a 5-year period. The new Atlas of Birds of Great Britain and Ireland includes both maps of the new atlas data and maps of changes in distribution from the previous atlas.

There is now much more emphasis on estimating abundance. Ontario was the only one to address this issue the first time. The European atlas has fantastic charts of abundance and increases and decreases by each of the 10 major countries. We could do this by physiographic regions within states. The European abundance data came from different projects in different countries (e.g., transects, breeding bird censuses) rather than from the atlas project itself. They took estimates in millions of pairs for each country, for minimum, maximum and geometric mean. The British system of determining abundance was based on frequency of occurrence. Participants selected a minimum of 8 of 25 2km square tetrads from each block and surveyed each for 2 hours, and the % of these tetrads in which the species was detected was then used as a measure of abundance. The selection of tetrads was not random. Only

presence/absence was recorded within a tetrad, rather than counts, except for some rare or colonial species for which actual counts were made.

There have been many ideas of using different colors to indicate increases and decreases. The European Atlas uses the size of a dot to show abundance, color to indicate status, and background to indicate type of coverage.

THE NEXT ONTARIO ATLAS

Charles Francis

Ontario has had one general planning meeting. The project will be a cooperative effort involving NGOs (Bird Studies Canada, Federation of Ontario Naturalists, Ontario Field Ornithologists) and government agencies (Ontario Ministry of Natural Resources, Canadian Wildlife Service, Forestry Canada), and others.

The proposed start is 2001, with pilot and developmental work in the 1999 season. The fund-raising process has not begun, and field work may be delayed if there are no funds. Estimated cost through publication is $1 million Canadian.

Reasons for doing a second atlas:

Diverse objectives

- Measure changes in distribution over 20 years in relation to land use, etc.
- Obtain precise localities for priority species
- Measure effects of forestry and other land-use practices on birds at landscape level
- Obtain estimates of relative abundance to identify core/peripheral areas, etc.
- Improve information for northern Ontario
- Identify habitat requirements and/or species assemblages within habitats
- Make data base compatible with other bird sampling programs to integrate results

Ideas on Sampling

- Must fit within 10x10 km sampling framework of previous atlas, but may be at a finer scale
- Finer scale may be desirable for estimating habitat relationships/land management effects - preferred scale not determined
- Incorporate measures of effort and estimates of relative abundance

Ideas on Quantitative Measures

- First atlas project asked people to estimate how many pairs occurred in a block - highly variable results
- Now considering a timed Christmas bird count style approach within smaller units (e.g. 2x2 km 2 for 2 hours with counts/estimates of numbers actually detected
- Number of tetrads or other sampling units and how to select them (probably not random because of access issues) not yet determined
- May consider greater flexibility (unlimited time as long as time is recorded, or estimate numbers checklist style during all counts in a block
- Also allow traditional data to be recorded
- Plan to reduce emphasis on confirmed breeding in favor of abundance measures

- For many analyses more important to get estimates of abundance
- Can tell people what species to expect in each block from first atlas
- Multi-tiered data base with different data collected by different methods

Ideas on Habitat Data

- Considered impractical to sample within habitats at a scale that will provide new information (i.e. better than forest vs. field, which is already known)
- Instead rely on precisely georeferenced data, to be combined with habitat data from other sources (e.g., remote sensing)
- Questions restricted to those at a landscape habitat mosaic scale, which is most appropriate for informing land management anyway
- Optionally, volunteers could help ground truth maps generated by remote sensing
- Could consider allowing data at finer scale

Computerization of data

- Allow for web-based data entry (perhaps BirdsSource) and reporting
- Also allow for some sort of paper data submission, probably scannable forms
- Plan to provide data on web but also produce book
- Rick West: Michigan got relative abundance in given habitat. Is this better than by-block approach? Look at this atlas to see how the habitat information was incorporated into species accounts.

DISCUSSION

Hugh Kingery: Colorado sampled habitats, and volunteers were willing and able to do it. We may think we know what habitats birds are using, but we really don't. Colorado learned a great deal from this information.

Charlie Smith: There are now recommended standards for habitat terminology that federal agencies are using, which is available on the web.

Mark Wimer: If we had given our Los Angeles County volunteers maps of all the habitats in blocks they would have excitedly rushed into all the different habitats.

Volunteer fieldworkers enjoy finding mistakes in the experts' data.

AUSTRALIAN ATLAS

Charles Francis

Involved year-round sampling, as most birds are residents

- 3 levels of sampling
    - 2-ha search for 20 minutes (preferred) (35%)
    - area search (any shape) for 20 min - 1 week
        - small (<500 meter radius) (41%)
        - large (500m-5km radius) (21%)
    - incidental search (other observations) (3%)
- Separate surveys of specific groups (e.g. shorebirds, waterfowl)
- Recorded habitat information, presence/absence, confirmed breeding, numbers

- Used GPS to record exact localities (necessary in Outback)
- Attempted minimum coverage in each 1 degree block
- Used scannable forms, also provided data entry software

Advantages:

- habitat specific, precise location
- relatively quantitative
- very versatile and flexible, like a checklist

Disadvantages:

- no sampling scheme below scale of 1 degree block
- uneven coverage of habitats and locations

NEW YORK SECOND ATLAS

Valerie Freer, Chair, NY Steering Committee

- Have spent a lot of time making decisions on objectives, roles, etc.
- Plan is to do it much like last time
- Using same codes
- Using the same blocks as before, blocks same size, shape, number for direct comparison
- Will send people to every block, not sample
- Have identified coordinators for each of 10 regions
- Few changes to field card, codes will be the same. Technology has changed dramatically, most changes involve increasing efficiency of data management
- Will use scannable forms, BBS-type form under consideration
- NY DEC providing computer support and basic foundation for atlas, including hiring coordinator
- Map production also facilitated by new technology;
- Field workers can obtain block maps via Internet, easily available, in color (for anyone with a color printer), and good detail. To view see http://dec.state.ny.us/websp/revision
- NY herp atlas has produced maps on Web site; will do this for bird atlas as well, updating as we go along
- GAP analysis also will be involved
- Abundance and habitat have been considered. There have been no final decisions as yet. There is likely to be special emphasis on these data at least for some species or in a given year.
- Foundation of project established, now hiring coordinator

Question regarding use of field cards and green sheets as in first atlas; response that with computerized data entry green sheets would be unnecessary.

Question about downloading maps from Internet. John Ozard handed out copies of computer-generated maps. USGS maps for all states are now available. Each map is on the Internet in full, but he does not have access to a large scale printer. They are cutting each 5km block from the quad and printing them on 8 ½ x 11 sheets. The scale is almost 1:24000 scale (1:24752), in order to fit on a page for a standard printer.

The NY Atlas Website address is: http://dec.state.ny.us/websp/revision

- 3 maps are currently available
- Need Adobe software to download them
- They are testing download speed on different modems
- Memory needs are 250 -300k per map so far, urban maps will be larger.
- The backup plan is for office staff to print out the maps and mail them to observers.

Cost of NY Atlas?

- Estimating about a million dollars through publication
- Intend to both publish a book and have data available on web

DATA COLLECTION AND MANAGEMENT

Chair: Bruce Peterjohn

With the first round of atlases, Ohio was using punch cards, and the atlases began and ended within state limits.

NORTH AMERICAN DATABASE

Steve Kelling (BirdSource Project Leader, Cornell Lab of Ornithology)

- Creation of database for breeding bird atlases across North America would need to build a relational database using the most current technologies.
- A NA database would be easier to maintain, since adding new data and changing to new database technologies in a single location would be more efficient and cost effective.
- This would require both a secure location and accessibility.
- Internet-based tools are needed for analysis at any level, across state, within state, physiographic region, township, etc.
- Technologies now exist on the web where you can select any area of interest for analysis.
- Crucial to georeference data

Proposal: Create a single repository for all State and Provincial Breeding Bird Atlases

1. Build a relational database using the most current database technologies.
2. Maintain the database. Keep the database up to date both in terms of new data, as well as in current technologies. Locate it in a secure environment with an off-site backup.
3. Develop Internet-based tools for the analysis and dissemination of atlas results. Ensure that the analysis can occur at any level and that data results can be analyzed both across states and provinces in physiographic regions, and by specific townships, ownership parcels, or atlas blocks.

Database Structure

- A major factor in the creation of a North American Atlas database would be to find the common denominators across all atlas projects, and not impose a rigid set of rules that would restrict individual state and provincial atlas project data collection.
- The database structure must be sufficiently flexible to incorporate all manner of atlas information, but have a set of data that would be collected across all atlas projects.

- In terms of database structure, a set of common denominators should be implemented across all atlas projects. This represents the core data for the North American Database. This core can be likened to the center of an onion and might include the following data fields:
    - Participant identification (necessary for data editing)
    - Location (at minimum this could be the centroid of each atlas block. This is crucial because it georeferences each data point for further analysis)
    - Date of sampling
    - Time of sampling
    - Duration of sampling
    - Indication of whether one is reporting all birds or a subset
    - Species identification
    - Nesting category (pull-down menu of observed behavior codes)
    - Measure of abundance (from simple estimates of numbers of each species to specific point counts)
- The above represent the minimum information necessary for inter- and intra-atlas analysis.
- Other layers can then be added to the onion - the core is simply the basis to start an atlas project from, NOT the end point. The database design must be flexible enough to ensure that each atlas project can gather additional information depending on state or provincial needs. These layers might include:
    - Habitat identifier
    - Weather conditions during observations
    - Block size variations

The implications of a North America Breeding Bird Database are enormous.

1. All atlas data would be in the same general format and at a single location. Specific differences across atlases could be housed within the database and available.
2. Atlas information could be made widely available and in a form that would be amenable to further analysis.
3. We are building for the long haul. Consider the next iteration of atlases, or the fourth. All atlas data could be maintained, updated, and housed in a secure manner, insuring its long-term availability.
4. Core data ensures across-atlas analysis capabilities.
5. Georeferencing each data point ensures that the North American Breeding Bird Atlas database can be part of a larger network of environmental and geographical data.

Distributed data sets, wherein data from different projects exists at different locations which are connected electronically, is a possible alternative to a centralized database.

There is interest in georeferencing and distributed databases from USGS, EPA, and GIS companies.

By georeferencing data, we will be getting into a position where data will be very valuable in conservation decision-making.

Conclusions

- Recommend the creation of a single database for North American Breeding Bird Atlases

- The atlas database should be housed in a secure environment
- A core thread of information (determined by a group such as this) would be a part of each state and provincial atlas.
- The database would be sufficiently flexible to incorporate any specific data-collecting requirements for a particular state or province.
- Internet technologies should be developed to make atlas results available in various formats and georeferenced to ensure that they remain part of the development of a distributed network of data sets.

DISCUSSION

Mark Wimer: Half of the value of a published atlas is the involvement of local people. Need to retain this ability to customize.

Charles Francis: The product should be the database. In order to use it, you need to visualize it. A book is one way to visualize it, and different analyses will use the data in different ways.

Steve Kelling: A centralized database would eliminate duplication of hardware in each state and province.

Bob Budliger: How much will it cost?

Scott Sutcliffe: First need commitment of states and agencies and vision of what it should look like before estimating cost.

DATA CENTRALIZATION ISSUES

Bruce Peterjohn and Keith Pardieck (Patuxent Wildlife Research Center)

Advantages

- Improves uses of data
    - Examination of regional patterns of distribution
    - Addressing of conservation issues
    - Implications for management of species/habitats
- Improves regional comparability of data
- Allows for additional scientific uses of data
    - Biogeographic studies
    - Landscape ecology studies

Disadvantages

- May reduce comparability with previously collected data from a state, province, or county
- Issues associated with atlas effort should be addressed
    - Is effort standardization possible?
    - Need to include effort data in databases
    - How can effort be documented?
    - Effort to locate species
    - widespread vs. localized/specialized species
    - Effort to document breeding status
    - Observers' identification skills cannot be quantified

DISCUSSION

Impossible to standardize effort - not just hours in the field, also includes observer id skills, hearing, awareness

Effort to locate species, effort to document breeding status are different

There are methods now that estimate species richness and correlate with level of effort that can be used to estimate species numbers that occur based on effort invested

If a species is not documented does it mean it is not there or that no one looked? If a species is documented you know it is there, if not, you don't know whether or not it is there.

CENTRALIZED DATABASE: ADDITIONAL ISSUES

- Standardization of data collection
    - Grid designs
        - How to deal with different grid designs?
    - Data collection issues
        - Standardization of "safe dates," acceptable codes for different species, ...
    - Emphasis on species detection or confirmation of breeding
    - Abundance data
        - Should a single method be adopted by all atlas projects?
- Data management issues
    - Develop a single database format?
    - States responsible for quality control
    - Need to record effort data
- Proprietary/publication issues
    - How important are data proprietary issues in the next atlases?
    - Internal publication vs. paper publication
        - Extensive publication on the Internet may preclude paper publications

DISCUSSION

Charles Francis: 2 issues - centralized database or distributed databases that can talk to each other - distributed databases enable local control but are much more expensive.

Charlie Smith: Federal databases have standards for map accuracy, metadata, and spatial referencing. If we wish to allow access or want federal funding will need to adhere to Federal Geographic Data Committee standards. A National Vegetation Standard has been developed and adopted and could be used for habitat designations.

With development of the Internet, remote access and management is now feasible.

Steve Kelling: ESRI is developing Internet tools to enable users to create maps from databases.

Bruce Peterjohn: States that are well-supported by agencies may be able to do much more and have their own data management, but other states may benefit greatly from centralized data management to reduce costs.

Coverage standards is a complicated issue, involving not only hours of effort for each block but also special efforts for particular species, e.g., use of tapes for owls and marsh birds.

Consensus of the group: Sending the data to a central place once the atlas is completed is highly desirable. Data bases need to be compatible.

The remaining issues need work. A subcommittee volunteered to work on recommendations to be reviewed first by this group, then by the full NORAC Committee.

Committee on Core Data Standardization/Central Depository for North American Atlas Data

- Mike Cadman, Chair
- Chris Elphick
- Charles Francis
- Steve Kelling
- Bruce Peterjohn
- Chan Robbins
- Charles Smith
- Scott Sutcliffe
- Joan Walsh
- Mark Wimer

OPTIONS FOR DATA ENTRY ONLINE/ WEB BASED ATLASES

Chair: Scott Sutcliffe

Steve Kelling

- Creation of Internet-based data form for data entry
- Internet use and technology are growing exponentially
- Enormous potential as tool for collection of ornithological data
- Cornell's Backyard Bird Survey Website had three and a half million hits, and 44 thousand checklists.
- Web-based data entry provides rapid access, error detection and correction, and prompt identification of areas or species needing further effort.
- How do you go about collecting data for the web?
- Can be problematic - a link breaks, a form doesn't work
- Would need to work on an easily navigable and quick-entry site
- Can tinker with form as data is being collected
- Propose standardized form with fields for core data but flexible to enable customization to each state and province
- Can create smart form in which expert has created set of filters that restrict the kinds of responses allowed, to avoid mistakes
- Some fields mandatory, others optional
- Ability to catch errors during data entry
- Can develop useful online help procedures that would help people navigate through data form

- Once you have a centralized data collection system, ability to manage it will reduce costs for everyone.
- Won't need server and team of developers for every state and province.
- Set of tools can be developed for atlas project where project leaders can develop their own form for state or province, no need for redundancy.

Why has Lab begun to emphasize this approach?

- Problems with scanning technologies
- Great expense in developing scanning materials
- If need to change form, big problem
- Some scanning idiosyncrasies - with Project Feeder Watch had booklet of forms, blots on adjacent pages caused problems
- Birds in Forested Landscapes - most participants had graduate degrees, but 30-40 percent had great difficulty filling out the forms and had to be called for explanations before data could be entered.
- Opportunity to take advantage of available and developing technologies which will increasingly become a part of the way people communicate and operate in North America.
- Smart Forms help to eliminate typos by setting limits on ranges of data that are entered - species and geographic areas, dates, numbers, etc. - by questioning the data and requiring confirmation that entry is correct, also flagging entry for evaluation by experts

WEB-BASED DATA ENTRY ISSUES

Bruce Peterjohn

- Not every atlas participant will have access to the Internet
    - Have to develop alternative(s) for those without Internet access
- Data entry requirements for participants may reduce efforts in the field
    - Procrastinators will procrastinate even longer
- Quality control issues remain after data are entered over the Internet
    - Edits in data entry interface can reduce likelihood of errors
    - Quality of entered data will vary between participants, and it may be necessary to check some/all of the entered data against original field cards

SCANNING AS A DATA ENTRY OPTION

- Minimize/avoid character recognition
    - Character recognition increases data verification time
        - Still faster than manual data entry
- Use of "bubbles" is preferred
    - Efficient processing of data forms
    - Minimal data verification time is required
    - Current software is very reliable
- Disagrees regarding expense of scannable option and difficulty of modifying form.
- Scanning technology is improving and costs are decreasing.

- Optical character recognition is improving but still has a ways to go, can separate whether field is reading character or number.
- Takes 15 minutes per form to edit BBS scanned form, an hour per form to enter and verify by hand.
- Economy of scale is considerable for hardware and data management costs.

DISCUSSION

Need to weigh observer preference for kinds of data - bubble, character, electronic entry.

Joan Walsh: Even if 30% of people enter their own data it will be a big help. Data proofing will still be necessary.

Rick West: The BBS is much more complex than atlases. Atlases could use other alternatives, such as an e-mail form attached back rather than on-line data entry.

HABITAT DATA COLLECTION

Dan Brauning

Discussion emphasized the importance of adding new information to earlier atlas data to justify the effort.

GEOREFERENCING

Tim O'Connell

There is strong potential for linking GAP analysis with atlas work.

What else can we do with atlas data?

- Can we use GAP to improve the survey effort?
- Are there more creative ways to use the data once collected?
- Stratifying data collection by elevation, physiographic provinces, ignoring state boundaries
- With atlas data that is georeferenced and tied to features on the ground, wall-to-wall coverage for all species on abundance would give better range-wide population estimates than are currently available

Problems

- Under-represented species and habitat types
- Using basic GIS layers can be misleading as the data may be some years out of date.
- Whip-poor-will is an under-represented species because of its nocturnal habits and is a species of concern because of BBS- indicated decline. When presumably-suitable habitat from GIS is correlated with distribution from atlas there is much more habitat available than is occupied, but we don't know if it is a sampling problem or real.
- Available habitat for the Blue Grosbeak is limited, but exceeds the current distribution. Is it because the species is being missed, because it isn't there, or because there is a problem with the habitat model?

- GIS can help to identify habitats that are under-represented in blocks.

DISCUSSION

Makes sense to come up with list of habitats that need special effort

Extensive mining in areas of Pennsylvania have created water quality problems that have affected LOWA distribution.

Mark Wimer: If we have a species distribution map and habitat distribution map, which way should it go? If there is a high level of effort and an absence means something, atlas data can be used to correct the habitat model.

Overlaying potential habitat and current distribution on maps can help to direct field efforts.

Kim Smith: No GAP projects received funding for vertebrate distribution ground truthing. Atlas projects provide excellent opportunities to ground truth GAP information on birds, which probably over-estimates distributions.

Washington overlaid GAP vegetation data and atlas data.

Chris Elphick: Nevada selected blocks stratified by vegetation, with simultaneous ground truthing of vegetation map. They hope to use this information to create models and develop probabilities of species occurrence in blocks not sampled, based on vegetation occurrence.

Hugh Kingery: Habitat data collection is important because species may be using more habitats than the literature suggests, or may be not occurring in some habitats where literature says they occur. There also may be geographic differences in habitat use.

Charlie Smith: Vegetation and bird data need to be in the same temporal scale. Not all animals occupy all the habitats they are known to use. NY can produce two lists of help to the next round of atlasers - species known to be there during the last atlas, and species predicted to be there by GAP analysis, based on vegetation.

ABUNDANCE INDICES

Chair: Charles Francis

Understanding abundance is important at habitat and geographic scales. British approach is to correlate abundance with frequency of occurrence. Ontario is considering having counts of species in given area surveyed.

DISCUSSION

Ted Floyd: Agrees that abundance data is better than just presence/absence, but feels it complicates presentation and statistical analysis.

Charles Francis: The product is a database, a book can present any subset of data you want. Statistics dealing with abundance data easier than that for presence/absence data.

Ted Floyd - Volunteers won't understand what it will be used for, or how it will be used in atlas, which is what they care about. It needs to be presented in the atlas.

Charlie Smith: It is important to ask what you want to learn from this data that you can't get from another source. Different states and provinces have different needs. Need to consult with a biometrician before beginning if you are going to collect it. Abundance is the most challenging question we have to answer in wildlife biology. Garbage in, garbage out.

Charles Francis: With presence/absence data, absence doesn't mean anything.

Rick West: Britain used absolute abundances, but we seem to be talking about relative abundance. If so, mini-routes like Maryland did seem to be a good approach.

Charles Francis: British estimates of absolute abundance are not very precise. One could have a double sampling scheme and get absolute abundance on a subset of sites and extrapolate. Any sampling scheme we come up with to get absolute abundance would have to use a tiered sampling scheme. We are most likely to get relative abundance data.

Joan Walsh: Probably not all volunteers would want to collect abundance data or be good at it, but a subset would be willing to do it and would do a good job. Could have some people doing mini-routes to get this data rather than trying to get everyone to do it.

Mike Cadman: When you do timed surveys, you need people with equivalent skills. One of the joys of atlasing is that people with lower skills can still participate, it just takes them longer.

Joan Walsh: There would need to be training for mini-routes.

Doug Kibbe: You wouldn't get equivalent results from all observers. I agree with the others who have spoken. Have you considered using pre-determined abundance categories?

Charles Francis: Another approach they were considering is keeping a daily checklist. The accumulated checklists for a block gives a relative measure of abundance by number of checklists with a given species. Another approach is to estimate species numbers on each trip.

Hugh Kingery: Habitat matters! It is most efficient to go to areas of a block with the greatest variety of species. This ignores the high numbers of widespread species in the remainder of the block where habitat is more homogeneous.

Charlie Smith: At the state level, the proportion of blocks occupied is highly correlated with BBS data for relative abundances.

Doug Gross: Cautionary notes from experience as a coordinator in rural Pennsylvania. People may be overestimating the number of people who will participate. Many birders aren't interested in atlasing. I'm concerned that if we get too engrossed with numbers we will turn off potential participants.

Mark Wimer: We used orders of magnitude as an estimate of what was in the entire square, but it can be hard to tell what to do with it.

The reality of atlasing is that people return to given areas. Every region has heroes, and if we take that person away to do counting or some other technique, it may cause a problem in getting regular block coverage. It is more important to get to out-of-the way places and survey for species under-represented in BBS.

Ted Floyd: If there is a positive correlation between frequency and abundance and if the primary goal is prediction of occurrence in areas not surveyed, you don't need abundance data unless there is very fine-grained heterogeneity of habitat.

Charlie: There are now extensive requirements for gaining access to private lands. We will be restricted to roadside surveys or written permission, which is big change from last atlas. This

will restrict much atlasing to public lands and roadside observations. People do atlasing because it is fun and easy. If we make it too complicated if won't be fun.

Chris Elphick: I don't think numbers need to be part of an atlasing effort. This can be accomplished by other means.

Dan Brauning: One thing atlases do is push participants' competence to higher levels. Is abundance data meaningful at the scale at which it would be collected?

Charles Francis: If participants recorded numbers and scale Christmas Count style, it can be flexible and useful. Abundance data can be atlas-specific. Projects can make it optional to collect this data, but if the database is centralized it needs to be able to accommodate it.

Dan Brauning: Projects can just use the folks willing to go above and beyond to collect this data, and not require everyone to do it.

Charles Francis: If observers submit day sheets we don't need a summary sheet. We need a database structure that allows participants to record what they are willing to record, above and beyond core data. In Australia, it can be either presence/ absence or numbers.

Mike Cadman: Atlas camaraderie is important with everyone working on the same thing together. We don't want to dilute this.

Charles Francis: It is a marketing issue, and can be a tiered approach.

There are flexible ways of getting more information out of atlasers without taxing all of them by using a two-tiered approach. Ontario will be grappling with this topic and others can listen in on the discussion by e-mail.

BBS DATA AND ITS USE TO NEXT GENERATION ATLASES

Presented by Keith Pardiek

BBS history

- Roadside avian survey program implemented in 1966 to monitor the status and trends of North American bird populations.
- Jointly coordinated by USGS Patuxent Wildlife Research Center and Canadian Wildlife Service.
- Approximately 2500 U.S. routes sampled annually by skilled birders.
    - Not necessarily the same routes sampled each year.
- Data provides an index of relative abundance, not a complete count.

Methodology

- Stratified random design used to place routes within states along suitable roads.
- Route is 39.4 km (24.5 miles) long with stops at 0.8 km (0.5 mi) intervals.
- A 3-minute point count is conducted at each stop where every bird heard or seen within 0.4 km (0.25 mi) radius is recorded.
- Surveys begin 0.5 hr before sunrise and take approximately 5 hours to complete.
- Surveys conducted once annually during the peak of the breeding season, usually June.

Past uses of BBS data by atlas projects

- Supplement BBA information (CO, OR, FL)
    - Map BBS routes to priority blocks and extract data from relevant stops.
- Relative abundance (OH)
    - Raw data from BBS routes available to BBA projects for analysis to provide general indications of relative abundance within state.
- Population trends (PA, MD)
    - USGS Patuxent Wildlife Research Center provides BBS population trends by state via the Internet.

Atlas limitations of BBS data

- Observations are primarily singing males and sightings of flying individuals, which correspond to "possible" or "probable" breeding status
- BBS participants are skilled birders but exhibit a wide range of expertise
    - Implications for using relative abundance
- Only have start point of routes georeferenced; the location of the rest of the route is only available in hard copy.
- It is a roadside survey, so focuses on roadside habitats, and doesn't address nocturnal, wetland, or alpine species.

What BBS can provide

- Since 1997, individual stop data have been digitized and are available via the Web, at www.mp2-pwrc.usgs.gov/bbs/
- Copies of route maps, stop descriptions, and observer contact information
    - BBA projects can obtain copies of maps or observers but need to make request well in advance
    - Depending on the state, 20-80 percent of routes have stop descriptions
- Patuxent WRC is interested in having stop locations digitized.
    - Provide GPS units to atlas projects (or BBS observers??)
    - Maintain geo-spatial database
    - Needs further discussion and development

DISCUSSION

Kim Smith: BBS data from Arkansas was used to test distributions in Arkansas habitat models. Routes were buffered routes for errors. Predictability for some species was terrible, but for others was 100 percent correct.

Can use BBS data with atlas data to check accuracy of BBS.

Bruce Peterjohn: Some species are better served than others by BBS because of their biology.

Carol Foss: Documenting which species are not accurately covered by the BBS could help to discourage inappropriate use of BBS data for other purposes.

STANDARD TECHNIQUES

Sub Committees created to work on these topics; will work by e-mail, report to this group, after input to full NORAC list.

Recommended Methods for Collection of Abundance Indices

- Chan Robbins, Chair
- Dan Brauning
- Doug Gross
- Charles Francis
- Doug Kibbe
- Rick West

Species Specific Atlasing Strategies and Standards

- Carol Foss, Co-chair
- Hugh Kingery
- Joan Walsh
- Rick West, Co-chair

There are two issues to address: the best way to sample and the best way to interpret observations. We need a Web document with a list of species, including species for which standard methods work, and other species for which special techniques needed, and provide species-by-species recommendations

Recommended Methods for Collection of Habitat Data & Recommended Method for Recording Fieldworker Effort

- Will be dealt with by the Core Data Subcommittee.

Maps (Rick West)

- Maps present a lot of data on a page
- Important not to lose detail of original data in more generalized map presentation, and to present as much data as possible without cluttering the map
- Can't keep on publishing simple dot data, opportunities for presenting more information

Hugh Kingery: It is important to retain all confirmation data, not just the highest code

PROPOSAL FROM LARRY MASTER OF TNC

Would like NORAC to adopt a standard form for reporting rare species and has provided a heritage program form for consideration.

Todd Schneider: The heritage form is complicated for some people to use. We use a species verification form with location identified on a photocopy of the quad map, and the staff goes through those and transfers the information to heritage forms if warranted.

Betty Anderson: The Massachusetts Heritage Program has a similar form but it is simpler to fill out, and includes the signature of the observer for legal documentation, and how many years of experience the observer has with the species in question.

Philip Unitt: San Diego County uses daily field forms and daily field maps. This form is overkill.

Concern was expressed about the lack of bird identification information on the Heritage form. It is more plant oriented than animal.

CONSENSUS TO ADD TO RECOMMENDED PROCEDURES

Each atlas project should use (as all have to date) a form for "asterisked species" (i.e. species that are state endangered or threatened, or species of special concern). It is very important that precise location information be collected (verbal site description, ownership of land if known, attached photocopy of map with location circled). Biological information about what was observed, and the code indicated is of primary importance of course. Signature of the observer is desirable, if possible, along with the observer's years of experience with the species. After review by the Regional Coordinator, form should be submitted to the state or provincial Heritage Program. If further details or forms are needed, the Regional Coordinator should fill them out to avoid overwhelming the atlas volunteer.

USES OF ATLAS DATA

Joan Walsh: The NJ wetlands conservation law is very strong; the Atlas data is important in protecting habitat, particularly threatened and endangered species. It has also been used in Birds of North America accounts, and the New York Bight project. Consultants often request it for development projects. NJ charged consultants for atlas data, and provided it free to government agencies and NGOs.

Hugh Kingery: Colorado is giving their data to TNC, the Colorado Bird Observatory, the Colorado Division of Wildlife, and the Audubon Society of Greater Denver

Mike Cadman: Ontario gave their database to the Heritage Program, and they handle requests for information.

Kathleen Anderson: Massachusetts Heritage has atlas data, but releases site information with a large buffer (i.e., a species is located somewhere within a given diameter radius)

Atlas data has been directly applied for many conservation purposes, town resource inventories, etc.

Concerns were expressed about misuse of data by consultants for developers, but the consensus was that as long as the information is available to both sides, there is not much to be done about it. It is just like any other scientific publication. Environmental organizations are just as likely to misuse data at one extreme as developers are at the other.

Doug Kibbe: If a consultant is relying on atlas data, he or she isn't doing the client any good and isn't saying anything the state doesn't already know. Atlas data is collected at such a large scale, that it is useless at the site scale, and developers really need site-specific data.

Charles Francis: If we are heading for Internet availability, we are heading for completely free access. Federal funding may require public access, and atlas data shouldn't be considered an income source.

Charlie Smith: If any federal money is used in the atlas, the information is public. It must be made available without fee to anyone requesting it.

Rick West: The process of atlas projects is a very important conservation and education tool, because participants become more aware of the needs of breeding birds, and their habitat associations.

The generation of predictive models at fine scales can be an important use of atlas data.

Atlas data can be extremely useful to state and federal agencies in environmental review.

Excellent and inclusive article on the uses of atlas data: Bird Study 44:129-145; 1998 (British Trust for Ornithology publication)

Doug Gross: Concerned about backlash from people who won't provide data on rare species if it is being publicized everywhere, because of birders abusing the situation or falconers using it to locate nests and remove nestlings.

Concern was expressed about wide access to data collected on private lands:

NJ directed in their handbook not to trespass on posted private lands without written permission; only one field worker was turned away. Posting was not a problem in NJ: all interesting open land is in public ownership, because of the population density. Ticks were more of a problem than posting; fear of Lyme disease kept people on the roads.

Ontario gave all their data to public agencies.

Some states said that they had provided all their rare species data to The Heritage Program, but it had not yet been entered in their database. NJ's has not been added in 7 years!

NY data use has changed completely, DEC says. Rare species data is with the Heritage Program. Used to get several thousand requests per year. Now data is wide open, except for species vulnerable to collecting, anyone can get it from the Web. Stressed importance of getting data out to developers while they are in the planning stages, and can more easily steer away from sensitive areas.

What about keeping secret locations of rare, threatened, or endangered species? Atlas volunteers won't give the data if they fear it will threaten the species. NY: when a field worker deliberately misled the DEC about the location of a rattlesnake den, it resulted in the den's destruction because the DEC thought it was 1 mile from its actual location. Could have protected it if they had known. Best to have the data open and available.

Can a species be found if people with bad intent know only that it is within a 10 sq. Mile block?

Some thought yes, easily, and some thought no. No consensus on this.

Doug Kibbe: Atlas data is useless for site analysis; not specific enough. Only a poor environmental consultant would buy it. Possible to charge for interpretation perhaps.

Rick West; atlasing is a conservation and education tool; results in a more aware public and a higher appreciation of habitat. Every 20 years we get the next generation. Essential for an informed public.

Sally Sutcliffe: remember the overall purpose is to conserve birds and their habitat!

Personal contacts with land owners or managers when rare species are found can be extremely valuable, circumventing Heritage data management problems. These relationships are very important to local conservation.

Papers have been published recently on the use of atlas data for studying fragmentation on a broad scale and to address other landscape ecology questions.

Bob Miller distributed a list of the uses of NY's Atlas Data, dated 1/25/99, reproduced below:

- Reference source for information on NY's breeding birds
- Statewide database maintained by DEC and Natural Heritage Program to respond to request for bird species lists for specific geographic areas in NY - used by DEC biologist for routine inquires, planning and project reviews; used to respond to request from consultants for env. reviews, researchers, outdoor writers, students, county and town planning bodies, Army Corps of Engineers, USFWS, National Park Service, etc.
- Source of observer information on rare species: Bicknell's thrush, northern harrier, short-eared owl, loggerhead shrike, common loon.
- Data used in statewide and regional publications on birds: Migratory Nongame Birds of Management Concern in the Northeast (Schneider and Pence 1992), Importance of Geographic Areas to Neotropical Migrant Birds in the Northeast (Rosenberg and Wells 1995), Grasslands of Northeastern North America (Vickery and Dunwiddie 1997), Important Bird Areas in NYS (Wells 1998), Bull's Birds of New York State (Levine 1998), Rare Species and Significant Ecological Communities of the New York State Wildlife Management Areas (Novak 1998), An Application of the New York Gap Analysis Database for Identification of Potential Bird Conservation Areas on Public Lands in NYS (Smith et all., in prep.).
- DEC bird studies and reports - Status of the Common Loon in NYS (Parker et al. 1986), Population Status of the Black Tern in NYS (Novak 1989), Critical Habitat Components for the Northern Harrier in NYS (Loucks 1992).
- Development of official state lists of endangered, threatened, and species of special concern.
- DEC fact sheets on listed species.
- DEC Unit Management Plans for Forest Preserve Lands
- Data layer in DEC's Division of Fish, Wildlife, and Marine Resources Master Habitat DataBank geographic information system (GIS). A special menu for analysis data is also available as an extension to the Master Habitat DataBank.
- Atlas data used to identify high quality boreal habitat for open space planning and acquisition - most recently in relation to the DEC acquisition of the Champion International properties in the Adirondacks.
- Atlas data used to determine presence of grassland bird species to assist field survey efforts in NY, 1997-98.
- Data layer in NY Gap Analysis Project
- Biodiversity inventory of state wildlife management areas, 1992-98.

SPECIAL FIELD PROBLEMS

Chair: Rick West

There are a number of problem species that deserve special attention and instructions. E.g.,

- Turkey Vultures fly over every block, and data that doesn't directly indicate breeding activity is meaningless.
- Least Bitterns are more likely to respond to broadcasts from the water than those from shore.
- Green Herons forage near nesting sites, unlike colonial herons.
- Buteos have small territories and usually remain on them, but current atlas protocols assume they shouldn't be counted as on territory.

DISCUSSION

- Los Angeles County has a code that has safe dates - encounter
- One approach to colonial waterbirds, is using "confirmed" for known colonies, and "observed" for all other observations
- With multi-brooded birds, where do the first broods go? Young mockingbirds go into substandard habitats where they do not breed
- The Maritimes developed a matrix of acceptable and unacceptable codes for each species
- Need for a handbook to compile this type of information

PUBLISHING THE ATLAS

Chair: Joan Walsh

Publishing is the first thing to talk about when planning an atlas! Most of the participants had published or were in the process of publishing their books. It may be only one way of presenting the data, but it gets the information in the hands of the public and is popular with atlasers.

John Zimmerman updated us on the Kansas atlas, to be published by the University Press of Kansas projected in Dec. 2000. No data on abundance is to be included, for reasons stated earlier and more. They used BBS data to show mean relative abundance by stratum. 204 species. He is one of the two authors. There is a two-page spread for each species. The write-ups will be primarily concerned with biogeographic reasons for distribution patterns.

Multiple authors versus one or two: can work either way; Ontario had good experience with multiple authors (Of 80 authors, 70 were fine.) Some editors, in retrospect, would have liked to have one author, themselves.

With some atlases, one person wrote certain sections of each account t: ie Joan did all status descriptions for the NJ book. One person did all the habitat write-ups in the Delaware book.

"Bird police problems" - state record committees sometimes make it difficult by delaying or worse reversing decisions.

Colorado paid people to write accounts or provided authors with a free atlas. Each author had to do 5 accounts. They budgeted for 1500 copies, and sold 1800 advance copies, which upped numbers to be

printed considerably. The publisher needed to have all publication money in advance, so they wound up self-publishing, and now have $25,000 in the bank for the next atlas.

Delaware and New Jersey will both do their books as state bird books, with the Atlas data part of the book.

Delaware has never had a state bird book. Did mini-routes, will present data in book.

Self-publishing: NJ highly recommends it. Keep control of the book, and it moves much faster.

They used Bob Berman (719-634-7736) and Cindy Lippincott as publication managers and recommend them highly: easy to work with and efficient. Hugh Kingery agrees for Colorado, several echoed: we raise the money and pay for it anyway with University presses, and they delay the project and throw obstacles in our paths.

Many steps: bird police, reviewers, copy editors, page layout. Allow plenty of time to get it out.

Most people are using ArcView for map production.

One university publisher said they can save $5000-$10,000 if the layout is provided in Quark.

Joan Walsh: It is important to spend money on good technical and copy editors, rather than on layout.

John Ozard: The format of the book is also important.

NORAC BUSINESS MEETING AT SIXTH NORAC CONFERENCE

Cornell University, 11 August 1999

BUSINESS MEETING

Meeting called to order by Sally Laughlin, Chair.

In attendance were atlas representatives from

- Arizona
- Arkansas
- Colorado
- Delaware
- Georgia
- Illinois
- Kansas
- Los Angeles County
- Mississippi
- Missouri
- Nevada
- New Jersey
- New Hampshire
- New York
- Ontario
- Pennsylvania

- Vermont
- USFWS
- BirdSource, Cornell Lab and National Audubon
- USGS Patuxent Wildlife Research Center
- Cornell Lab of Ornithology

NORAC STATEMENT OF PURPOSE

The NORAC Statement of Purpose was modified to read as follows:

The North American Ornithological Atlas Committee consists of one representative from each of the states, provinces, and, counties (in California) involved in conducting or actively planning a breeding bird atlas; representatives of the federal agencies involve in bird censusing in the United States and Canada; individuals most involved in atlasing in the Americas; and editors of the various atlas volumes.

The purpose of NORAC is to facilitate breeding bird atlasing in Americas by:

- providing guidelines for atlasing standards
- providing regular means of communication between states and provinces
- involved in and/or planning atlases

NORAC sponsors conferences on breeding bird atlasing every three to four years. In 1991 the conference was sponsored by the Colorado Breeding Bird Partnership and held in Keystone, Colorado. In 1994, a NORAC conference was held 20 June, prior to the combined AOU, Wilson, Cooper meeting, in Missoula, Montana. In 1999, the conference was held 11 August in Ithaca, New York, prior to the AOU meeting.

A NORAC Website is maintained at the American Birding Association site at www.americanbirding.org/NORAC. It contains the full text of the 1990 Handbook for Atlasing American Breeding Birds, a list of published atlases, and the NORAC Directory of Atlas Contacts. Corrections to the list should be sent to Sally Laughlin, NORAC Chair, at laughlin@sover.net or Chan Robbins at Chan_Robbins@usgs.gov.

WEBSITE

Thanks to the American Birding Association, NORAC now has a Website.

WEBSITE: www.bsc-eoc.org/norac

NORAC HISTORY

Thanks to Sally Sutcliffe's good memory, the dates in the history were corrected. They will be posted on our Website at American Birds.

PROCEEDINGS

We will keep minutes on today's meeting, which will be e-mailed to all attending, and posted on the Website. Carol Foss is taking notes. Everyone who has presented is urged to please give Sally or Carol a copy of their presentation.

OFFICERS

Officers were impressed into duty, with there being an especial lack of enthusiasm for the Chair position. Sally noted that she has done it for 9 years and would be very pleased to have someone take it over. In the end, Mike Cadman of Ontario agreed to co-chair the group. Thus, officers until the next meeting are:

- Co-chairs: Sally Laughlin (Vermont) and Mike Cadman (Ontario)
- Vice Chair: Chan Robbins
- Secretary: Carol Foss (New Hampshire)
- Organizer of next NORAC Conference: Scott Sutcliffe (Cornell Lab of Ornithology)

NEXT MEETING

Scott Sutcliffe offered to organize the next meeting (the 7th NORAC Conference) in 2002 or 2003 in conjunction with the AFO meeting.

SUBCOMMITTEES

Several of the more difficult issues were referred to Subcommittees, who will develop recommendations for consideration by the full NORAC e-mail list.

The subcommittees are requested to report within a month (before 1 October) on their timeframe for submitting recommendations or alternatives for consideration.

If NORAC can reach a consensus (with one vote for each state, provincial, or county atlas project) on an issue, it will become part of our recommended procedures. If not, the recommendation or alternatives will be posted on our Website as potential approaches.

The Subcommittees who agreed to work on the various issues are:

Core Data Standardization/Central Depository for North American Atlas Data

- Mike Cadman, Chair
- Chris Elphick
- Charles Francis
- Steve Kelling
- Bruce Peterjohn
- Chan Robbins
- Charles Smith
- Scott Sutcliffe
- Joan Walsh
- Mark Wimer

Recommended Methods for Collection of Abundance Indices

- Chan Robbins, Chair
- Dan Brauning
- Charles Francis
- Doug Kibbe
- Rick West

Creating a Handbook on Recommended Atlasing Techniques for Species and Species Groups

- Carol Foss, Co-chair
- Hugh Kingery
- Joan Walsh
- Rick West, Co-chair

Recommended Methods for Collection of Habitat Data & Recommended Method for Recording Fieldworker Effort will be addressed by the Core Data Subcommittee.

ATTENDANCE AT THE SIXTH NORAC CONFERENCE

at Cornell University, AOU, August 11, 1999

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