A SYNOPSIS OF THE SOUTHERN NATIONAL FORESTS' MIGRATORY AND RESIDENT LANDBIRD CONSERVATION STRATEGY, THE R8BIRD DATABASE, AND THEIR USE BY THE OZARK-ST. FRANCIS NATIONAL FORESTS

GLEN R. THOMAS[1]

INTRODUCTION

In 1996, the USDA Forest Service, Southern Region (i.e., Region 8, R8), implemented the Southern National Forests' Migratory and Resident Landbird Conservation Strategy (SNFLCS) in accordance with guidelines published by Hamel (1992), Gaines and Morris (1996), and Hamel et al. (1996). To provide storage and analysis of the avian ecological data collected using this strategy, a database (DB) named R8BIRD was derived and placed into service under the direction of Margaret Griep (Regional Wildlife Ecologist). With that preface, the project as a whole — both the strategy and the database per se — has long been collectively referred to simply as R8BIRD.

SOUTHERN NATIONAL FORESTS' MIGRATORY AND RESIDENT LANDBIRD CONSERVATION STRATEGY

The SNFLCS was originally derived as a fifty-year project designed to record the responses of avian communities to forest management through an ecological time frame. Under its protocol, avian breeding-season point-counts were to be conducted once annually on each census plot. Initially, plots were established in a variety of habitats on all ranger districts (RDs) of each of the Southern Region's national forests with prescribed baseline vegetation and GPS raw data collected.

In 1996, 220 plots were established on six of seven ranger districts of the Ozark-St. Francis National Forests (OSF). In 1997, sixteen plots were established on the seventh RD, the St. Francis (STF), and an additional ten plots were established on the STF Stumpy Point Acquisition in 2006, bringing the STF total to 26 plots. Currently, the OSF has a total of 246 census plots (Table 1).

For most of the region, point-counts were initiated in 1997. Each point-count was to last ten minutes during which all birds detected visually and aurally were to be recorded by species, including age and sex, if possible (Gaines and Morris 1996, Hamel et al. 1996). Weather conditions during each point-count were also to be recorded. Additionally, a prescribed set of habitat parameters was to be collected for each plot at least once every five years, or more often in the event of significant vegetative disturbance (e.g., resulting from a timber harvest, wildlife thin, prescribed burn, insect irruption, or extremely severe weather). The OSF currently collects vegetation data for at least 20 percent of all plots annually, allowing for an entire rotation to be completed every five years.

[1]Consulting Ecologist, Ecospectra Services,
201 North Shore Drive, Russellville, Arkansas 72802-8827;
Telephone: (479) 747-4186; E-mail: gthomas@ecospectra.com;
URL <http://ecospectra.com>

On the OSF, 147 total plots for four of seven RDs were established by their respective district biologists and wildlife technicians, with all ensuing bird observation and vegetation data from 1997 through 2009 collected by same. I established 99 total plots for the Sylamore, Big Piney North (formerly the Buffalo [BUF] RD prior to its collapse with the Bayou [BAY] RD [i.e., Big Piney South] into the Big Piney RD) and the St. Francis RDs, and have annually collected all bird and vegetation records for them since project inception (Table 1).

Habitat Types	Sylamore	Big Piney North (BUF)	Big Piney South (BAY)	Pleasant Hill	Boston Mtn	Magazine	St Francis	Total
Glade	3	2	3	2	3	2	0	15
Yellow Poplar	0	0	0	0	0	0	2	2
Pine Early	1	0	4	2	1	2	0	10
Pine PT Closed	0	1	3	2	1	2	0	9
Pine Open PT/ST	2	1	4	1	2	4	0	14
Pine Closed ST	3	4	10	5	5	7	0	34
Hwd Dry Open	3	4	3	2	4	1	2	19
Hwd Mesic ST Closed	7	18	12	10	13	1	5	66
Hwd Dry Closed	3	6	4	4	2	1	2	22
Bottomland Hwd Wetland	0	0	0	0	0	0	10	10
Riparian	2	4	3	4	3	1	2	19
Hwd Early	1	2	1	1	2	0	2	9
Mixed PT Closed	0	2	1	2	1	1	1	8
Mixed ST	1	3	1	2	1	1	0	9
Total	26	47	49	37	38	23	26	**246**

Table 1. Ozark-St. Francis National Forests' plot totals by district and habitat type for the Southern National Forests' Migratory and Resident Landbird Conservation Strategy.

R8BIRD DATABASE

The R8BIRD DB was created for the storage and analysis of data collected from multi-year breeding-season point-count surveys performed under the SNFLCS. In it, records are entered and maintained for bird observations, habitat components, and historical management activities for each survey plot. The DB supplies assessment tools for deriving species demographics, regional spatiotemporal dynamics, and local area diversity. The system is used for forest planning and analyses to support avifaunal conservation. Enduring through four previous versions, the newest — version 5 — was recently launched for regional use.

R8BIRD DB version 1, an Oracle system, was placed into service in 1999. On the OSF, this version was centrally-served by the computer shop (no longer in operation) at the OSF Supervisor's Office (SO). While data could be entered using this version, they were difficult to view, correct, or use to derive reports.

By 2002, the DB had been converted to a Microsoft Access platform by the Conservation Management Institute (College of Natural Resources, Virginia Polytechnic Institute and State University). There were two MS-Access iterations, versions 2 and 3, and they were, at least in part, designed to comport with NRIS FAUNA protocol (Griep 2003, Fauna Development Team 2004).

These particular versions were operated on the OSF in stand-alone fashion, not centrally-served at the SO. Each OSF RD would annually receive its own DB on a compact disc containing only its respective data. After each year's data were entered, these respective RD DBs would be sent to Atlanta, where they were merged into a single OSF DB for regional office use. Subsequently, the merged OSF DB would be split, returning it to its former status, that of seven individual RD DBs. These individual DBs would then be returned to their respective districts. This cycle continued for several years.

Eventually, I discovered serious OSF data contamination, and it was determined that the DB's splitter applet was the cause. Examples of contamination included: (1) missing and erroneously converted records, and (2) the creation of many duplicate records in each individual RD's raw data tables. There were numerous missing vegetation and event records. Erroneous conversions included having all OSF Acadian Flycatcher (*Empidonax virescens*) records for species identification converted to species unknown. Moreover, not only was each RD DB contaminated with duplicates of its own records, but with duplicates from all other OSF RD DBs, as well. Until its discovery, this contamination process had compounded annually — unabated and exponentially — and was, in short, a catastrophe. Ralph Odegard (OSF Forest Wildlife Biologist [ret.]), tasked me with repairing the data sets. The restoration of every OSF raw data set to a state of integrity was a complex and tedious assignment, requiring many weeks to complete. Since that time, to maintain data entry consistency and DB integrity at the forest-level, I have functioned as principal OSF R8BIRD data steward, annually entering all OSF field data into the DB, maintaining DB consistency checks, performing DB troubleshooting, and functioning, as needed, as R8BIRD liaison between the OSF and the regional office.

Not all forests used decentralized (stand-alone) data entry for versions 2 and 3. Those that did maintain DBs centrally-served at their respective SOs never had their DBs split and merged, and, thus, did not likely encounter issues with duplicates to the same level as the OSF. They did, however, report problems with missing and erroneously converted records. I do not know to what level these issues were resolved for other forests.

In 2007, Tim Mersmann (Regional Planning Biologist) decided to create a regional DB centrally-served by one data center. R8BIRD version 3 was then retired and replaced by version 4, a temporary DB created on an Oracle platform by David Belcher (Applications Developer, Southern Region). It was used to record data during 2007 and 2008. Version 4 was recently taken off-line in anticipation of the 2009 launch of version 5.

Developed and created by Margaret Griep and the Digital Visions Enterprise Unit, version 5 is built on an Oracle platform (Digital Visions Enterprise Unit 2009). In addition to data entry tools, standardized reporting features (i.e., canned reports) are to include those for relative abundance, species dominance and rarity, frequency distribution, and validation monitoring. Output selections for each report are to include filing, printing, and e-mailing. This version is also designed to provide direct

downloading of data and reports to MS-Excel. These data should also be viewable in MS-Access through subsequent importation into same.

Version 5 has undergone two rounds of beta-testing with the second being completed in June 2009. Working with Margaret Griep, I performed beta-testing — including data entry, troubleshooting, debugging, and generation of canned and original analytical reports — for the OSF, National Forests (NFs) in Alabama, Cherokee NF, NFs in Florida, Kisatchie NF, George Washington and Jefferson NFs, and USFS Land Between The Lakes National Recreation Area. Initial beta-testing revealed significant problems with this version's standard reporting features. For example, temporal trend totals by species results were routinely unacceptably high. One RD was shown to have ~1,000,000 bird observations recorded during one breeding season alone. Also, species relative abundance results routinely had solutions of >1.0. The values for most, if not all, species should have been <1.0, and very uncommon species <0.1. Results for frequency of occurrence were routinely incorrect, as well. Finally, on many occasions, reports did not run at all. The Enterprise Team determined that the above-mentioned difficulties appeared largely corrected by the time the second round of beta-testing ended. They subsequently placed the new database in the queue for data center checks, and it was brought on-line for regional use during October 2009. That said, during and after 2009 data entry, I will perform an independent round of troubleshooting for entry and reporting functions to verify current accuracy and consistency.

RESEARCH

Linder and Buehler (2005) and La Sorte et al. (2007) represent the two published works of significance on the SNFLCS and R8BIRD. Margaret Griep recently indicated there are plans to perform further analysis for publication, which will include information on detailed habitat relationships, after the newest version of the database is released.

Linder and Buehler (2005) used power analysis to examine the SNFLCS's ability to detect population trends at three spatial scales: RD, NF, and physiographic province. They contend that efforts at the RD scale were inadequate. While the level did vary with sampling intensity, forest-level success was also generally low. Results indicated that for some NFs, the ability to detect a 3-percent annual decline for a species may require >50 years, an unreasonably long period of time to wait prior to initiation of adequate conservation efforts. The program showed reasonable success in detecting population trends at the level of physiographic province. While they believe the program may be sufficient for the detection of moderate trends in common species, they are not prepared to stipulate the same for species of concern, which are frequently narrowly distributed or uncommon.

La Sorte et al. (2007) examined population trends for bird species in the Southern Region's NFs from 1992 to 2004. Habitat occurrences based on thirteen forest types and four successional stages were derived for 114 species. Additionally, these results were compared and contrasted with population trend estimates from the U.S. Geological Survey's Breeding Bird Survey. Respectively, populations increased and decreased for 42 and 38 species. While consistent habitat associations for many species were apparent, these trends showed wide variation regionally.

CONCLUSION

In 2009, at fourteen years of age, the goal of the SNFLCS remains as it was at inception in 1996 — to monitor landbird populations and their responses to forest management across the Southern Region through the collection of bird, vegetation, and event records during the avian breeding season. Over the years, the total accumulation of data has grown to be so large that to keep pace with it, the design, construction, and maintenance of five consecutive database versions have been required. Comprehensive research using these data was initially begun in 2002 and has culminated into two publications with plans for a third underway.

Given a fifty-year collection cycle, the project as it now stands would end in 2046. To date, the OSF has consistently maintained a very strong level of professionalism in both field monitoring and data stewardship. Despite past issues with data contamination — or due, at least in part, to the solutions we derived for them — the OSF DB is currently rated as having achieved the standard of excellence for Region 8. We hope for a smooth transition to version 5. However, as with any project of such large scope, it is reasonable to believe we might encounter some difficulties. That said, our lengthy experience from project inception to the present finds us strongly placed to solve them as they may arise, both at the forest level and in concert with the regional office.

LITERATURE CITED:

DIGITAL VISIONS ENTERPRISE UNIT. 2009. Region 8 bird lesson guide. USDA Forest Service. Digital Visions Enterprise Unit. 43 p. [Internet]. [cited 2009 November 10]. Available from: http://fsweb.dv.r5.fs.fed.us/bird/docs/index.php?path=./Documentation/.

FAUNA DEVELOPMENT TEAM. 2004. Fauna Version 1.3.1 User Guide. USDA Forest Service. NRIS FAUNA Information Tools for Terrestrial Biologists. 198 p. [Internet]. [cited 2009 November 10]. Available from: http://fsweb.nris.fs.fed.us/product/fauna/131/files/user_guide.pdf.

GAINES, G. D. AND E. MORRIS. 1996. The Southern National Forests' migratory and resident landbird conservation strategy. USDA Forest Service, Southern Region, Atlanta, GA. 124 p.

GRIEP, M. K. T. 2003. Technical user guide for the R8BIRD Access database version 3.0. USDA Forest Service. Southern Region. Biological and Physical Resources. Wildlife Ecology. 89 p. [Internet]. [cited 2009 November 10]. Available from: http://fsweb.r8.fs.fed.us/nr/bio_phy_res/wildlife/documents/2Users%20Guide.pdf.

HAMEL, P. B. 1992. The land manager's guide to the birds of the South. Gen. Tech. Rep. SE-22. USDA Forest Service, Southeastern Forest Experiment Station, Asheville, NC. 437 p. [Internet]. [cited 2009 November 10]. Available from: http://www.srs.fs.usda.gov/pubs/gtr/gtr_se022.pdf.

HAMEL, P. B., W. P. SMITH, D. J. TWEDT, J. R. WOEHR, E. MORRIS, R. B. HAMILTON, AND R. J. COOPER. 1996. A land manager's guide to point counts of birds in the southeast. Gen. Tech. Rep. SO-120, USDA Forest Service, New Orleans, LA. 39 p. [Internet]. [cited 2009 November 10]. Available from: http://www.srs.fs.usda.gov/pubs/gtr/gtr_so120.pdf.

LA SORTE, F. A., F. R. THOMPSON, III, M. K. TRANI, AND T. J. MERSMANN. 2007. Population trends and habitat occurrence of forest birds on southern national forests, Gen. Tech. Rep. NRS-9, USDA Forest Service, Newton Square, PA. 260 p. [Internet]. [cited 2009 November 10]. Available from: http://nrs.fs.fed.us/pubs/gtr/gtr_nrs9.pdf.

LINDER, E. T. AND D. A. BUEHLER. 2005. Analysis of U. S. Forest Service bird point-count monitoring database — implications for designing and implementing avian monitoring. Pages 950-955 *in* Ralph, C. J. and T. D. Rich, editors. Bird conservation implementation and integration in the Americas: proceedings of the Third International Partners In Flight Conference. 2002 March 20-24, Asilomar, CA. Gen. Tech. Rep. PSW-GTR-191, USDA Forest Service, Pacific Southwest Research Station, Albany, CA. 1294 p. [Internet]. [cited 2009 November 10]. Available from: http://www.fs.fed.us/psw/publications/documents/psw_gtr191/Asilomar/pdfs/950-955.pdf.