MAPS Chat

An occasional newsletter of the Monitoring Avian Productivity and Survivorship (MAPS) Program

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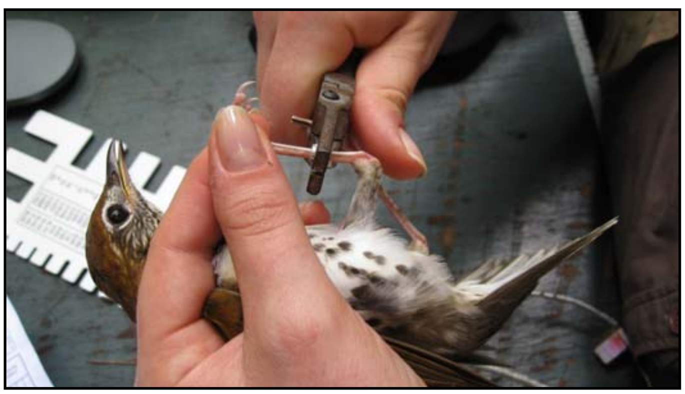
MAPS and the conservation of common species

[Jim Saracco, Ph.D.](#)

A great deal of the interest, resources, and design of conservation is geared toward the preservation of rare, threatened and endangered species. On the surface, such a focus seems logical - we are losing species at a rate equaling or exceeding any extinction event known in the history of our planet. Our immediate attention must therefore aim to save the species most at risk. Yet common species, many of which are the focus of the MAPS program, have an important role to play in guiding conservation. Indeed, a growing body of research suggests that 'keeping common species common' (a central goal of Partners in Flight) may be at least as important in maintaining healthy functioning ecosystems as preventing extirpations of rare species. The roles of common species in ecosystems are myriad. They provide important ecosystem services, contribute most of the biomass and energy turnover, and create conditions conducive to the survival of many rare species.



The urgency to conserve common species is highlighted by the fact that many of our most characteristic and charismatic bird species are declining. A recent report on 'The State of the Birds' suggests that eastern forest birds, as a group, have declined by about 25% over the past 40 years. As someone who grew up in Pennsylvania, the idea of an eastern deciduous forest without the song of the **Wood Thrush** (*below*) is almost difficult for me to fathom.

Yet, if estimated declines are correct, an encounter with this species, particularly in smaller woodlots, may soon become a rare experience. Although western forest birds may be faring somewhat better overall, monitoring data are sparse for many western forest-obligate species, making it difficult to generalize as to the overall health of these bird communities.

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Declines and local extirpations of common species are truly tragic, and may signal an overall degradation in environmental conditions. In the past, loss of common species could often be easily attributed to simple causes. For example, the Passenger Pigeon, once the most common bird on the continent, was clearly driven to extinction through a combination of commercial hunting and habitat loss. Causes of recent declines are often less obvious, and may involve a complex mix of habitat loss and fragmentation, disease, and exposure to various stressors related to climate change. The complexity of factors driving declines is compounded for migratory species, which experience various stressors at different times of the life cycle, making the untangling of individual causal factors especially difficult.

Despite the challenges involved in understanding declines in common species, cooperative monitoring efforts, such as the MAPS program (and during winter, the MoSI program), serve as models for implementing broad-scale monitoring and research to shed light on these issues. MAPS, via its clearly defined goals and protocols, and through annual participation and endorsement of many hundreds of organizations, governmental agencies, and individuals, has made, and will continue to make, important contributions toward understanding proximate demographic and ultimate environmental causes of declines in common landbird species. Such information is critical for supporting informed science-based management that is capable of reversing population declines and maintain healthy populations, communities, and ecosystems.

As I sit here at my desk staring at the reams of data generated as part of the MAPS program and pondering how they can best be leveraged to stem the tide of species loss, it is easy to lose sight of the importance of individual contributions. Yet it is the collaborative nature of MAPS and the efforts of individual cooperators that are the most critical elements of the MAPS recipe - without sustained contributions from each and every one of you, we would have little chance of meeting our goals of informing bird conservation. So on behalf of all of us here at IBP, I'd like to extend a big thanks to all of you; your dedication in setting out before dawn for months and years on end to set up nets and band birds as part of the MAPS program is truly inspiring. So let's forge ahead and keep both the MAPS cooperator and the birds that we love common! **Good luck during the 2010 season!**

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PROJECT SPOTLIGHT: Using MAPS data to inform public land management in the Pacific Northwest

IBP recently received funding through the US Forest Service Pacific Northwest Region to analyze the 18-year MAPS dataset (1992-2009) collected throughout Washington, Oregon, and Northern California. This dataset encompasses 129 MAPS stations – 41 stations operated directly by IBP and 88 stations run by independent MAPS cooperators, including Klamath Bird Observatory and Redwood Sciences Laboratory.

Above: Analysis of MAPS data collected by IBP and multiple independent cooperators will help land managers to foster and maintain high quality bird habitat in Pacific Northwest forests.

This exciting new project, directed by MAPS Research Scientist Dr. Phil Nott, will use MAPS data from throughout the Pacific Northwest to investigate the effects of weather and landscape variables on avian demographics, and will yield management recommendations and 'decision support tools' to help public land managers safeguard populations of birds that inhabit Pacific Northwest forests.

This collaboration with the Forest Service is developing new was to ensure that lessons extracted from MAPS results feed into decision making by land managers, and also provides a great example of how MAPS data from multiple station operators can be aggregated regionally, further enhancing their potential for informing conservation and land management.

MAPS operators provide samples for avian infectious disease studies • Updates from UCLA

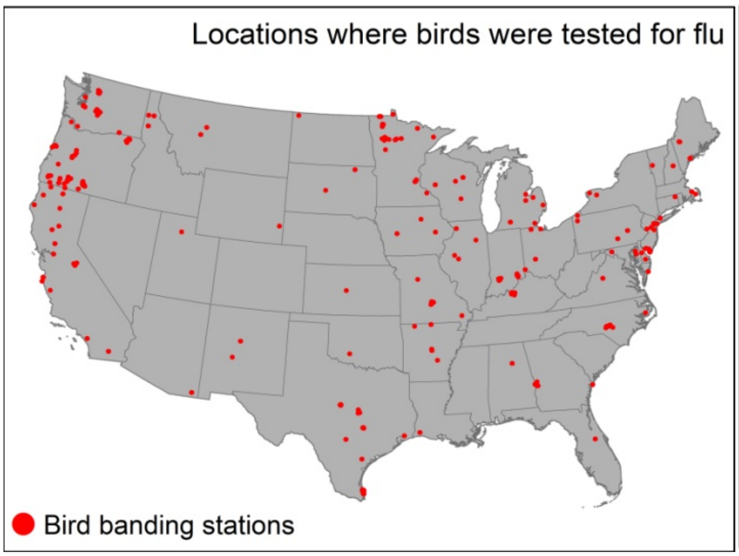
Ryan J. Harrigan, Trevon Fuller, Sassan S. Saatchi, and Thomas B. Smith
UCLA Center for Tropical Research

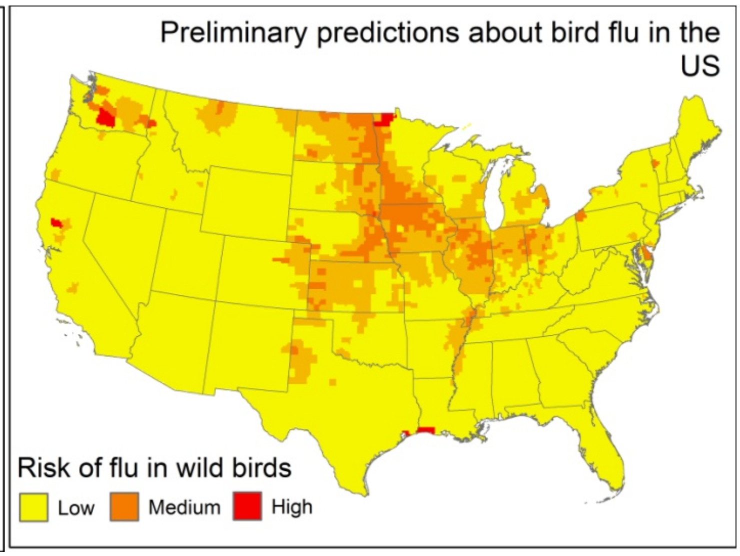
Additional information about these projects is available at http://www.ioe.ucla.edu/ctr/research/avian-pathogens.html.

Avian Influenza Monitoring

In 2009 MAPS banding efforts coordinated by IBP continued to make important contributions to research on avian influenza, also known as "bird flu". Flu is an important health problem in human populations because of pandemics that occur once every few decades, resulting in millions of deaths. Although flu is rarely transferred directly between birds and people, genes from the flu virus that infects birds sometimes join together with the human flu virus in intermediate hosts such as pigs to produce a dangerous new hybrid strain of flu.

It has been known since the 1970s that flu is present in ducks and wading birds. A new finding emerging from the analysis of samples contributed by banders is that flu is much more prevalent in the order Passeriformes than previously appreciated. Thus far, flu has been detected in 22 species of passerine birds using the data contributed by MAPS operators and other banders. This research has identified parts of the United States where the risk of flu in wild birds is likely to be particularly high based on environmental conditions, which can help federal agencies decide where to test for flu in wild birds in the future and may ultimately contribute to the prevention of flu in human populations.





Above: Bird samples collected by MAPS operators and other bird banders (left panel) facilitate scientific analysis of flu risk (right panel). Results are preliminary.

Flu has been documented in people for 2,400 years, yet many puzzling questions remain about the origins of this disease. For example, almost nothing is known about flu in song birds or perching birds in the order Passeriformes. However, data gathered by MAPS station operators has recently begun to shed light on the prevalence of flu in passerine birds. Ongoing work at the Center for Tropical Research at the University of California, Los Angeles is analyzing biological samples provided by MAPS operators and other banders in order to gain a better understanding of the spatial pattern of flu in wild birds in the United States.

West Nile Virus monitoring

West Nile virus was only recently introduced to North America, but in that time it has had dramatic impacts on both humans and wildlife. The first reported appearance of this virus was in New York in 1999; since then, it has spread rapidly across North America.

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West Nile virus must have a vector to transmit to either a bird or mammal, and in North America, these vectors are primarily mosquitoes of the *Culex sp.* group. Understanding how virus, vector, and host population movements affect the transmission dynamics of this infectious disease is of paramount importance in mitigating and preventing its effects.

Feathers contributed by MAPS operators are allowing UCLA researchers to sample migratory taxa identified as potential carriers of West Nile virus across long migratory pathways. Recent research has suggested that birds are likely still able to migrate even if carrying an active infection of West Nile virus, and this could mean a rapid and long-distance transmission of the disease to new locations at stopover sites and on wintering grounds. This may be particularly harmful for Central and South American year-round residents, as they may not have been previously exposed to the virus.

Over 2,600 feather samples were collected by banding volunteers in 2009, and species that were represented include Wilson's Warbler, Yellow Warbler, House Finch, Brown-headed Cowbird, House Finch, Gray Catbird, Swainson's Thrush, Hermit Thrush, Common Yellowthroat, and American Robin. This last species, the American Robin, is currently thought to be particularly susceptible to mosquito bites and virus infection, and as a migrant or partial migrant across most of North America, represents a potential long-distance spreader of West Nile virus. To date, over 1300 samples have been tested from samples collected, with 8 positives identified. While this represents a relatively low percentage of migratory birds with West Nile virus, a single bird has the potential to infect multiple feeding vectors at both stopover and wintering sites.

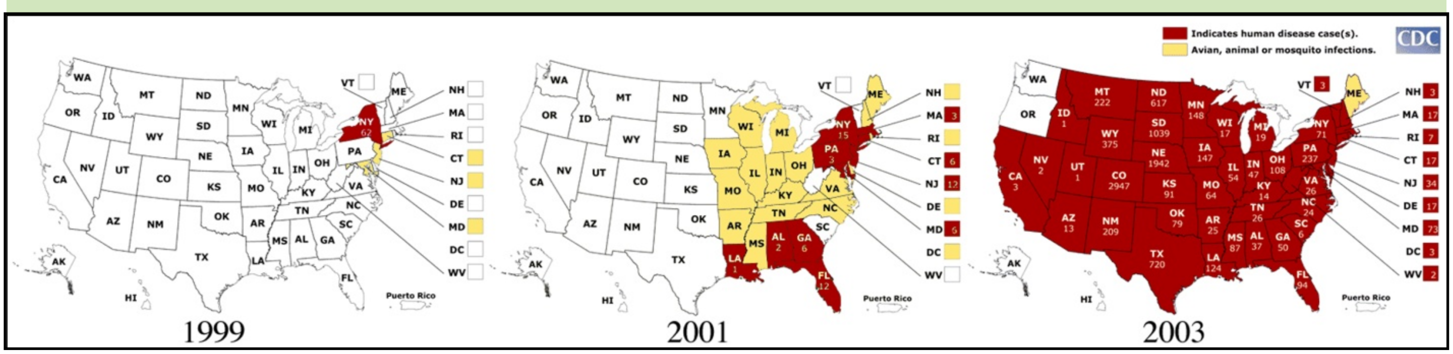
This collection and research effort will, with the help of MAPS operators, contribute to the understanding of how novel infectious diseases are transmitted and spread through natural populations.

New MAPS operators — Welcome to the MAPS flock!

The following operators joined the MAPS Program during 2009 or very early in 2010, and we want to wish them a warm welcome. Some are beginning operations at a new station and others have inherited a previously operated station. We look forward to having them as part of the MAPS banding community for many years to come.

***Josh Arrants**, Columbia, SC ● **Ryan Atwater**, Green Bay, WI ● **Terry Blankenship**, Sinton, TX ● **Lynn Brandon**, Bryson City, NC ● **Leone Brown**, Stony Brook, NY ● **Nicole Chadwick**, Columbia, SC ● **Jared Clarke**, Regina, SK ● **Jessie Coty**, Livermore, CA ● **Dan Derbyshire**, Hartington, ON ● **Ryan DiGaudio**, Bolinas, CA ● **John Dickson**, Tallulah, LA ● **Mark Fredlake**, FL ● **Marcel Gahbauer**, Calgary, AB ● **Dr. Selma Glasscock**, Sinton, TX ● **Gay McDougall Gruner**, Beaconsfield, QC ● **Gypsy Hanks**, Farmerville, LA ● **Troy Hershberger**, FL ● **Mark E. Hopey**, Mars Hill, NC ● **Marie-Anne Hudson**, St-Anne-De-Bellevue, QC ● **Tait Johansson**, Katonah, NY ● **Stephen J. Myers**, Riverside, CA ● **Brittany Petersen**, Farmerville, LA ● **Tiffany Shepherd**, San Diego, CA ● **Scott Simmons**, Vian, OK ● **Kelly Sorenson**, Salinas, CA ● **Mike Stake**, Salinas, CA ● **Jessica Stanton**, Stony Brook, NY ● **Joseph Sullivan**, Woodland, CA ● **Cindy Trombino**, Grayslake, IL ● **Daniel Walker**, Cotulla, TX ● **Harold Werner**, Three Rivers, CA ● **Lynn E. Wickersham**, Durango, CO ● **Bethany Woodworth**, Biddeford, ME*

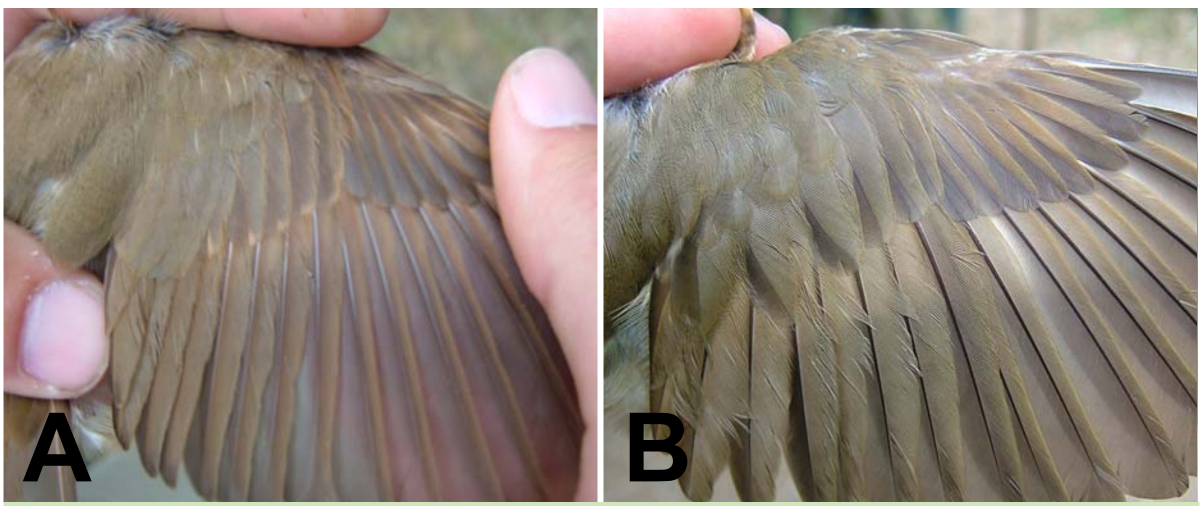
Below: The spread of West Nile virus in the US, 1999-2005. The relative role of localized vs. long-distance transmission in this spread is currently unknown. Figure adapted from CDC website.



Obtaining open-wing images of birds for analysis of molt and plumage state

Peter Pyle

Most first-cycle (HY/SY) landbirds captured for banding at MAPS stations can be aged by the presence of molt limits in the wing, whereas adults (AHY/ASYs) have uniformly replaced feathers. These limits, representing boundaries between replaced formative feathers and retained juvenal feathers, are found in predictable places within and between wing-feather tracts, but in certain species the positions of limits can vary substantially among individuals. Chicks that fledge from later or second broods often replace fewer feathers during the preformative molt than those from first or early broods. For example, individuals of certain flycatchers, thrushes chickadees, wrens, and other groups that replace fewer feathers show molt limits among the lesser and median coverts whereas those that replace more feathers can show them within the greater coverts, between the greater and primary coverts, and/or among the tertials.



Above: **Open-wing digital images of Swainson's Thrushes captured in central California in May. Note the molt limit within the greater coverts of Figure A, the inner four feathers being much fuller and of better quality than the outer five feathers and the shorter carpal covert. The buffy shaft streaks to the retained greater coverts also help us determine age, but note that many SY *Catharus* thrushes lack these tips, in which case the molt limit becomes the most reliable means of ageing. Figure B represents an AHY/ASY; note that the basic greater coverts are uniformly high in quality and show no molt limits.**

Species that can replace primaries and secondaries in typical or "eccentric" molt sequences often show the most variation in molt extent; for example, House Finches can vary from replacing only a few wing coverts during the preformative molt, to replacing all wing coverts and many primaries and secondaries in eccentric or typical sequences, to having a complete molt of all wing feathers! We still have a ways to go in understanding variation in the placement of molt limits, even among some of our common landbird species.

Much of the data used to determine molt-limit placement in a given species have been derived from specimens, but wing feathers in skins can be difficult to analyze without damaging the wings themselves. More and more, we are turning to digital photographs to study molt extent in birds, and the wings are where all of the action is. The seminal work using photographs of wings resulted in a beautiful book produced by Swiss ornithologists Lucas Jenni and Raffael Winkler (1994) - *Moult and Ageing in European Passerines* - but unfortunately this book is out of print and no-longer available. In 2003 former IBP biologist Dan Froehlich produced a primer American version of Jenni Winkler, now available on IBP's website.

I continue to encourage MAPS and other banders to take digital images of open wings. The idea to

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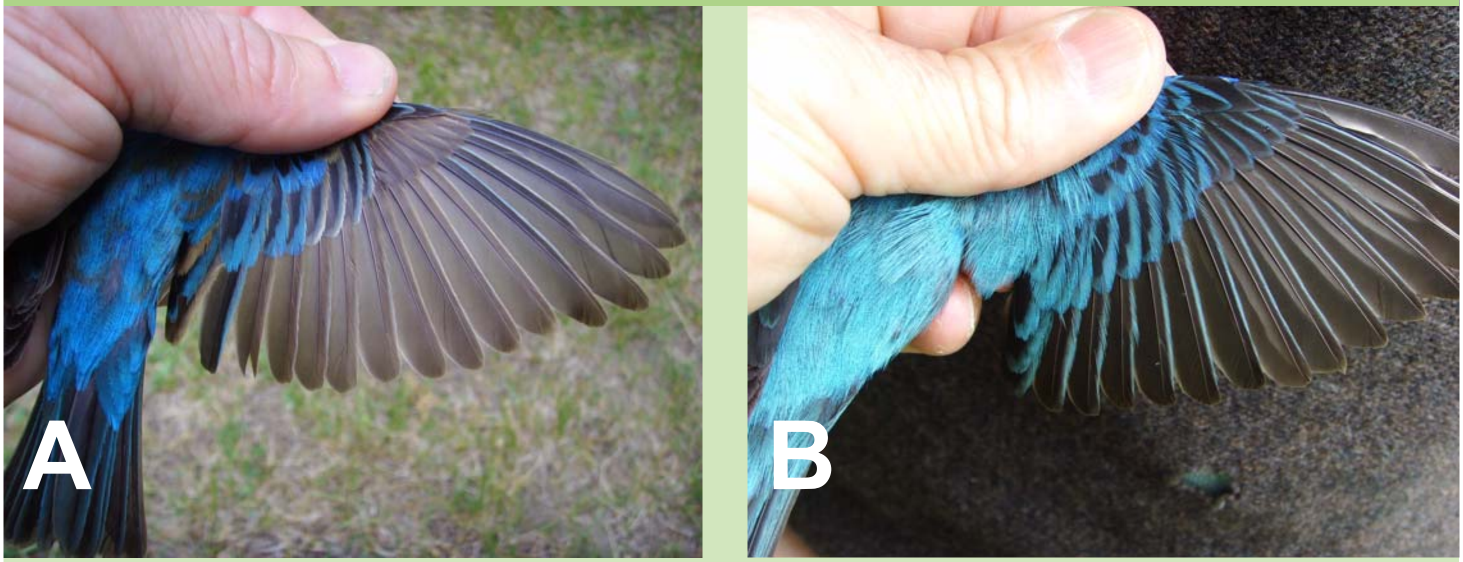

Above: **Wings of male Indigo Buntings captured at a MAPS station in Indiana in May. On the SY (A) note the "eccentric" molt pattern, the outer five primaries having been replaced during the preformative molt while the inner four primaries are retained and juvenal. The wing coverts and inner secondaries have three generations of feathers: *juvenal* (primary coverts and outer five secondaries), *formative* (outer three greater coverts, the carpal covert, and the innermost and largest tertials), and *alternate* (inner six greater coverts, middle tertial and s6). On the adult (B) all secondary coverts and tertials are *alternate* whereas the primary coverts are *basic*; note especially the black-and-blue primary coverts (B) as compared to the brown feathers of SYs (A). The color of the primary coverts is the best way to age these birds in winter, when both HY/SYs and AHY/ASYs can show mixed brown-and-blue formative or basic tertials and greater coverts.**

create an on-line catalogue of these images has been batted around for awhile, and Marcel Gahbauer of McGill Bird Observatory has now produced an excellent age/sex-determination resource for eastern landbirds using open-wing and other images. Josh Scullen of San Francisco Bay Bird Observatory (formerly at Big Sur Ornithology Lab) has devised a photo box specifically to take high-quality images of wings, and I have provided some summary instructions on how to take digital images in the hand, in connection with creating a catalogue for open-wing images of Neotropical birds. If anyone in the MAPS program would like to contribute digital images of wings, I offer my services in helping determine age and sex, in return for being able to catalogue your images. In this manner we can use an exciting and simple new method to learn more about the birds we catch, increase the precision of age determinations, and contribute more valuable data to MAPS and other programs involving captured landbirds.

Below: **Woodpeckers show similar but complicated wing-molt patterns among species. During the preformative molt they replace all primaries and most or all greater coverts but no primary coverts, resulting in limits between the primary coverts and greater coverts, as in this SY Nuttall's Woodpecker captured in May in California (A). During the next (second prebasic) molt they typically replace 1-5 outer primary coverts, leaving inner primary coverts (and often central secondaries) juvenal and very worn, as in this TY Red-bellied Woodpecker captured in May in North Carolina (B). Older woodpeckers show a mixture of generations among the primary coverts (and secondaries), as in this ATY Red-bellied Woodpecker, also captured in May in North Carolina (C). Digital images can help us work out variation in these complicated woodpecker molts, allowing confident ageing to TY, ATY, and perhaps older groups.**

MAPS data continue to yield cutting-edge science for managing bird populations

*Part of IBP's mission is to analyze MAPS data and put the results to use in conservation and science. During the past year IBP scientists have continued to produce reports for public lands managers, and to publish scientific papers based on data from the MAPS program and closely related bird banding projects. Peer-reviewed, MAPS-related scientific papers published or submitted by IBP in 2009 are listed below – **thank you to all MAPS operators for making these important scientific contributions possible!***

Chambers, M. K., G. David, C. Ray, B. Leitner, and P. Pyle. *In press.* **Habitat selection and conservation of molt migrant landbirds in the Mexican monsoon region of Arizona.** *Southwestern Naturalist*.

DeSante, D. F., and D. R. Kaschube. 2009. **The Monitoring Avian Productivity and Survivorship (MAPS) program 2004, 2005, and 2006 report**. *Bird Populations* 9:86-169.

DeSante, D. F., D. R. Kaschube, J. F. Saracco, and J. E. Hines. 2009. **Power to detect differences and trends in apparent survival rates**. *Bird Populations* 9:29-41.

DeSante, D. F., and J. F. Saracco. 2009. **Power of the MAPS program to detect differences and trends in survival and a vision for program expansion**. *Bird Populations* 9:42-75.

Nott, M. P. *In press*. **Demographic monitoring, modeling, and management of landbird populations in forests of the Pacific Northwest: an application of the MAPS dataset**. Pages xx-xx. In Informing Ecosystem Management: Science and Process for Landbird Conservation in the Western United States. J. L. Stephens, K. Kreitinger, C. J. Ralph [eds.], USFWS Biol. Tech. Pub., FWS/BTP-xxxxx-xxxx, Washington, DC.

Pyle, P. W. A. Leitner, L. Lozano-Angulo, F. Avilez-Teran, H. Swanson, E. Gómez-Limón, and M. K. Chambers. 2009. **Temporal, spatial, and inter-annual variation in the occurrence of molt-migrant passerines in the Mexican Monsoon region**. *Condor* 111:583-590.

Robinson, R. A., R. Julliard, and J. F. Saracco. 2009. **Constant effort: monitoring avian population change though standardized ringing**. *Ringing and Migration* 24:199-204.

Saracco, J. F., D. F. DeSante, M. P. Nott, and D. R. Kaschube. 2009. **Using the MAPS and MoSI programs to monitor landbirds and inform conservation**. Pp. 651-658 In: Proceedings of the Fourth International Partners in Flight Conference: Tundra to Tropics (T. D. Rich, C. D. Thompson, D. Demarest, and C. Arizmendi, editors). University of Texas-Pan American Press.

Saracco, J. F., D. F. DeSante, M. P. Nott, W. M. Hochachka, S. Kelling, and D. Fink. 2009. **Integrated bird monitoring and the Avian Knowledge Network: using multiple data resources to understand spatial variation in demographic processes and abundance**. Pp. 659-661 In: Proceedings of the Fourth International Partners in Flight Conference: Tundra to Tropics (T. D. Rich, C. D. Thompson, D. Demarest, and C. Arizmendi, editors). University of Texas-Pan American Press.

Saracco, J. F., J. A. Royle, D. F. DeSante, and B. A. Gardner. *In revision*. **Modeling spatial variation in avian survival and residency probabilities**. *Ecology.*

Saracco, J. F., J. A. Royle, D. F. DeSante, and B. A. Gardner. *In revision*. **Spatial modeling of survival and residency and application to the Monitoring Avian Productivity and Survivorship Program**. *Journal of Ornithology.*

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IBP staff teach bird banding classes!

Do you know someone who would like to participate in a beginner or advanced bird banding class with an IBP instructor? We are facilitating several classes in 2010. Please visit our training webpage for dates and locations.