MAPS Chat

The annual newsletter of the Monitoring Avian Productivity and Survivorship (MAPS) Program

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Indigo Bunting by Jeff Robinson


Black-headed Grosbeak by Bill Bouton, CC BY


Black-capped Chickadee By Christian Skorik

MAPS Data in Action

Danielle Kaschube, MAPS Coordinator
Steve Albert, Assistant Director for MAPS and MoSI

Have you given a MAPS contributor a pat on the back lately? If not, you should! MAPS station operators have exerted an amazing amount of effort that has allowed The Institute for Bird Populations (IBP) and our colleagues at other institutions access to an unparalleled data set of over 2 million bird banding records, collected from nearly every state and Canadian province. Every MAPS station and every MAPS cooperator contributes to this effort. As Jodi Isaacs, Environmental Scientist with California State Parks, recently put it: “Contributing to something bigger than us -- something accomplished by working together as a bigger whole -- helps us feel connected. We also learn about management needs for our lands and give people the opportunity to connect to the importance of protecting habitats.” Within the past year alone, papers using MAPS data have been published in some of North America’s leading scientific journals, covering a wide variety of topics. Below we share summaries of a few of these papers, and a related website.

New Website Summarizes Vital Rates of North American Landbirds

In June 2015, IBP launched a new website that uses MAPS data to summarze the vital rates of many of North American landbirds, www.VitalRatesOfNorthAmericanLandbirds.org. The site presents estimates and indices of vital rates including productivity, survival, recruitment, and population change for 158 species, and includes graphs showing change over 15 years and spatial differences, by Bird Conservation Region.

Front page of Website VitalRatesOfNorthAmericanLandbirds.org.

Prior to the MAPS Program, there was relatively little continent-wide standardization in the way vital rates data were collected and analyzed, and for many species there were very little vital rates data at all. With the launch of Vital Rates website, researchers and land

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managers now have a tool for exploring both temporal and geographic variation in landbird vital rates.

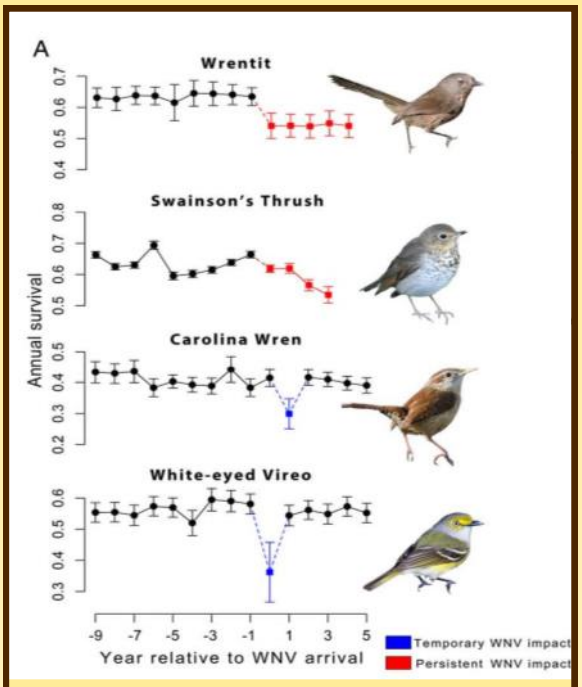
DeSante, D. F., D. R. Kaschube, and J. F. Saracco. 2015. Vital Rates of North American Landbirds. www.VitalRatesOfNorthAmericanLandbirds.org: The Institute for Bird Populations.

MAPS Data Reveal Persistent Effects of West Nile Virus in Many Bird Species

West Nile virus is killing more birds than previously thought, according to a study recently published by IBP researchers and colleagues in the journal *Proceedings of the National Academy of Sciences*. The findings, which were based on 16 years (1992-2007) of MAPS data in conjunction with spatial and temporal models of West Nile virus risk to humans developed by researchers at UCLA Center for Tropical Research, have implications for the world's ecosystems, human health, and bird populations.

Tracking the spread of the virus, along with a detailed analysis of vital rates data from MAPS stations, the authors found that West Nile virus had large impacts on the annual survival rates of landbirds. Overall, nearly half (23 of 49) of the species studied were negatively affected; for some species, the adverse impacts on survival persisted for years after the initial arrival of the virus, whereas survival rates of other species returned to previous levels fairly rapidly.

For example, in species such as Wrentit and Swainson's Thrush, survival decreased after the arrival of West Nile virus, and remained low in subsequent years (shown by the red portions of the line graphs at right for these two species). In other species, such as the Carolina Wren and White-eyed Vireo, survival was reduced during or immediately after the year of West Nile virus arrival, followed by recovery in subsequent years despite the disease persisting in the community (shown in blue in the line graphs at right).



Two types of effects of West Nile Virus on four species.

"The study suggests that West Nile virus is an additional factor that could reduce the growth rate of bird populations over the long-term….It may not lead to the extinction of the species, but the presence of West Nile virus will make it harder for populations to recover," George said.

The researchers aren't sure why some species appear to recover quickly and others do not. "That's really the question our study opens," said Ryan Harrigan, a co-author and biologist at UCLA. "The deeper story is that, without long-term monitoring and detailed data, we miss patterns like these," said Joseph LaManna, a co-author and researcher at Washington University. "Deaths in one area can easily be masked by immigration from other areas," he added, "and we wouldn't really notice unless we happened to be looking at the right type of data."

New MAPS Operators Join the Flock — Welcome!

The following operators joined the MAPS Program during 2015 or early in 2016 and have not yet been welcomed to the program. Most are beginning operations at a new station but others have inherited a previously operated station or are starting a new station after being away for awhile. We look forward to including them as part of the MAPS banding community for many years to come. A warm welcome!

David Alexander Duluth, MN ● **Katie Allen** San Diego, CA ● **Clifford Berek** Hillsborough Township, NJ ● **Fiep de Bie** Stratford, PE ● **David Elwonger** Woodland Park, CO ● **Dawn Fariello** Bronxville, NY ● **Gigi Gerben** Venetia, PA ● **LeJay Graffious** Bruceton Mills, WV ● **Ashley Green** Millers Farm, MA ● **Patrick Keenan** Portland, ME ● **Diane Luck** Woodland Park, CO ● **Margie Menzies** Duluth, MN ● **Kevin Methuen** Edmonton, AB ● **Jan Quailey** Morgantown, WV ● **Kevin Regan** Portland, ME ● **Catherine Ricketts** Wewahitchka, FL ● **Gary Schneider** Charlottetown, PE ● **Heidi Ware** Boise, ID ●

George, T.L., R.J. Harrigan, J.A. LaManna, D.F. DeSante, J.F. Saracco, and T.B. Smith. 2015. Persistent impacts of West Nile virus on North American bird populations. Proceedings of the National Academy of Sciences - Early Edition. Posted online 11/3/15 prior to print. PDF

MAPS Data Validate a New Method to Delineate Natural Population Structure in Landbirds

Understanding what constitutes a bird species "population" is an important concept, but one that is surprisingly difficult to pin down. For example, should populations be based on geographic boundaries, or on underlying biological similarities? Many conservation plans and management strategies ostensibly work at the population level yet, in many cases, the populations themselves are poorly defined. In fact, to date, there are currently no objective methods for empirically delineating large-scale population boundaries using demographic data.

Hermit Thrush, one of the species studied in the population structure paper. Photo by Daniel Berganza, CC BY

Recently, IBP Scientist Jim Saracco and colleagues at the Smithsonian Institution developed a novel approach for using Breeding Bird Survey data to quantify geographic structure in trend and abundance, and identify distinct natural populations for eight species of passerines. The researchers then used vital rates derived from MAPS data to independently validate their promising new method of population delineation.

Rushing, C.S., T.B. Ryder, A.L. Scarpignato, J.F. Saracco, and P.P. Marra. 2016. Using demographic attributes from long-term monitoring data to delineate population structure. The Journal of Applied Ecology. Early View published online at http://onlinelibrary.wiley.com/doi/10.1111/1365-2664.12579/abstract.

GPS Tracking Reveals Molt-Migration in a Black-headed Grosbeak from Yosemite

Miniaturized gps technology is providing unprecedented glimpses into the migration habits of songbirds. Black-headed Grosbeaks (*Pheucticus melanocephalus*) have been observed to undergo prebasic molt during fall in the North American Monsoon region of the southwestern United States and northwestern Mexico, but it is unknown whether molt migration – in which birds where birds stop at intermediate locations after leaving their breeding grounds to molt some or all of their feathers before continuing to wintering areas - is pervasive across populations of the species.

During the 2014 breeding season, IBP scientists collaborated with staff at Yosemite National Park to place miniaturized GPS tags on several adult Black-headed Grosbeaks captured at a long-running MAPS station in the park. A year later, we recaptured one of these birds

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IBP Bird Teaches Banding Classes!

Each year IBP teaches several bander training classes for both beginning and advanced banders. There are only two courses with space available currently scheduled for 2016.

Summer 2016
Two banding classes will be held at the Wolf Ridge Environmental Learning Center in northeastern Minnesota this summer. The advanced class will be held June 20-24, 2016 and the beginner class will be held June 26 - July 2, 2016.

Please contact the class host, Peter Harris or check out the banding class page at Wolf Ridge for more information about the classes and information on how to register.

Classes are often added throughout the year so please visit our bander training page for more information.

If you would like host a class at your facility. See our training web page for more information.

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with his gps tag still attached. Data downloaded from the unit revealed that, by 20 August 2014, the bird had moved 1300 km from Yosemite National Park to Sonora, Mexico, where it remained until at least 15 October 2014. By 24 November 2014, the grosbeak had moved >1300 m from Sonora to the Michoacán-Jalisco border region where it remained until the last GPS-determined location was obtained on 24 March 2015. The seasonal timing of these movements and the length of stay in Sonora are consistent with the expected behavior of a molt-migrating bird. Remote-sensed Enhanced Vegetation Index (EVI) data indicated that the grosbeak arrived in the monsoon region near the area's annual peak in EVI, and then, as the index was declining sharply, departed for the Michoacán-Jalisco region, where the index also declined during the same period, but substantially less so than in Sonora. Climate change in the coming decades is expected to delay the annual onset of the monsoon while also accelerating the initiation of arid, summer-like conditions throughout much of western North America, possibly yielding a temporal mismatch between fall migration and the monsoon-driven conditions that may be critical for molt-migrating birds.

Siegel, R. B., R. Taylor, J. F. Saracco, L. Helton, and S. Stock. In press. GPS-tracking reveals non-breeding locations and apparent molt migration of a Black-headed Grosbeak. Journal of Field Ornithology.

Chipping Sparrow Breeding, one of the species studied in the population structure paper. Photo by naturepicsonline, CC BY

MAPS Monitoring Assesses Effects of Noise Disturbance on Birds at a Spatial Scale that Informs Land Management

How does infrequent but substantial noise disturbance affect nesting birds? This is an important question for land managers like those at the Los Alamos National Laboratory which, though surrounded by some relatively pristine habitat, nevertheless has occasional strong disturbances from explosives testing. The Lab has one of the longest-running MAPS stations, and scientists from Los Alamos and IBP were able to leverage18

Breeding, molting and wintering grounds determined from a GPS tagged Black-headed Grosbeak.

years of MAPS data to examine the relative abundance, survival, and productivity of several bird species in response to periodic noise from Lab operations involving high explosive detonations. The study, which showed that the detonations did not have a measurable effect on avian community composition, or on the abundance or demographics of the species studied, provides a good example of how MAPS monitoring can provide important information for land managers at the local scale.

Keller, D.C., P.R. Fresquez, L.A. Hansen, and D.R. Kaschube. 2015. Avian community composition in response to high explosive testing operations at Los Alamos National Laboratory in northern New Mexico. The Journal of Environmental Protection 6:1442-1453. PDF

Birds and Urbanization

The human impact on landscapes and habitats is increasing over most of North America. What impact is this having on birds? Researchers Leone Brown from Stony Brook University and Catherine Graham from the University of Georgia used 19 years of MAPS data to examine the effects of urbanization on 68 bird species across the northeastern United States. They found reproduction, but not survival, was influenced by urbanization, suggesting that management should target increasing nest sites and reducing nest predation. The authors suggest that determining traits associated with demographic rates and urbanization across broad geographic extents can provide new insights for species' management and help guide conservation initiatives.

Brown, L.M., and C.H. Graham. 2015. Demography, traits and vulnerability to urbanization: can we make generalizations? The Journal of Applied Ecology 52:1455–1464. PDF

Collaboration Opportunity: The Timing of Bird Food

Allen Hurlbert, Associate Professor, University of North Carolina

Banding data have been essential to our understanding of many aspects of bird biology including patterns in survivorship and breeding productivity. Another important factor that we can pull out from long-term banding data is the seasonal timing, or phenology, of birds' reproductive cycle, e.g., when does a given species tend to show up on the breeding grounds; when do we first start seeing evidence of reproductive activity via brood patches or cloacal protuberances; when are hatch year birds first caught in the nets; and, perhaps most importantly, have these dates been changing over time?

Black-capped Chickadee with caterpillar (top); Tracie Hayes conducting a survey.

Large-scale warming has meant the earlier onset of spring in many regions, but have birds been shifting their phenology as well? If they have, have they been shifting it enough? Answering the second part of that question is tricky because it requires some yardstick against which shifts can be measured. The most obvious yardstick is the timing of the spring pulse in insects that birds rely on to successfully raise their young. MAPS is partnering with a new citizen science project called **Caterpillars Count!** that aims to measure the phenology of bird food (caterpillars and other insects) relative to the phenology of the birds in those same locations. **With your help, we hope to address this question across the many MAPS stations across the country!**

Home page of Caterpillars Count.

Caterpillars Count! is a standardized survey of foliage arthropods that can be done around your banding station. It requires the ability to identify arthropods to Order (i.e., distinguishing beetles from leafhoppers from caterpillars from spiders) and so can be done by almost anyone with some basic training, and we have some resources to make this easier. Data can be submitted via smartphone apps or through the project website, and submitted data can instantly be visualized through our Explore Data tab (Figure below). Collecting these data might take one person an hour or two depending on the chosen level of sampling effort. However, this is the perfect exercise for small groups of interested volunteers that might visit the banding station, and could potentially be done in only half an hour.

Interested in participating? Here are the next steps:

- Check out our Participate page to read more about details of the methodology, along with specific notes for MAPS stations.
- Contact me if you think you'd like to participate. I will set up a site ID and password so that volunteers can submit data to your site.
- Let me know if you'd like to schedule a **Caterpillars Count!** orientation via phone call or webinar.
- The more frequently you participate (e.g. every or every other banding session), the more valuable the phenological information you are providing, but ***any level of participation is welcomed!***

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MAPS Operator Profile:

As MAPS operators, you spend numerous hours in the field collecting data, then entering and verifying it, before passing it on to us at IBP. Through short notes, phone calls and your data, we get to know you over the years but often you don't get to know one another. We wanted to devote some space and make some connections between all of you who are so important to us and the program. In this MAPS Chat we introduce, or provide more background on, the man who is responsible for starting the MAPS Program.

The Man Who Began MAPS: David F. DeSante

Danielle Kaschube, MAPS Coordinator
Rodney Siegel, IBP Executive Director

Dave DeSante is the founder of the MAPS Program and is a legend in the bird banding community. Wherever we travel, there is someone who either knows Dave and wants to pass on a hello, or has heard about Dave, and wants to know a little bit more about him. We hope that this article lets you get to know the man behind MAPS a little better.

Dave was born in Akron, Ohio in 1942, but has lived most of his life in California. He is a passionate birder, and has been well known in California birding circles since the 1960s.

Dave earned several degrees, and was working on a Ph.D. in metallurgical engineering and materials science (he was literally a rocket scientist!) when his passion for birds finally took over his academic career. He switched fields to biological sciences and started studying bird migration and navigation. During this time he proposed the "mirror-image misorientation" theory that he had begun developing after working on California's Farallon Islands, and was involved in several first state records of vagrant birds. The theory, which became the basis for his Ph.D. thesis, suggests that birds experiencing "misorientation" aren't wandering aimlessly, but rather have a distinct sense of orientation - in the wrong direction.

Dave finished his Ph.D. at Stanford University in 1973. While teaching population biology and ornithology at Stanford University and Reed College he began conducting fieldwork in the Sierra Nevada mountains, where he previously pioneered the teaching of bird-banding workshops. In 1977 his long interest in Sierra birds ignited a multi-decade field study in the Hall Natural Area near Yosemite National Park. His research there yielded important publications on multiple topics, including the role of recruitment in avian population dynamics.

In the late 1970's Dave left academia to become Director of Landbird Research at Point Reyes Bird Observatory (PRBO), where, among other things, he continued his work on the Farallon Islands and also spearheaded and standardized new monitoring efforts at Palomarin Field Station.

In 1988 Dave left PRBO to found The Institute for Bird Populations (IBP) and pursue IBP's flagship project, the MAPS Program. Dave was truly ahead of his time in recognizing not only the need for demographic monitoring to better understand the causes of changes in landbird populations, but also the power of a well-conceived, standardized protocol to facilitate meaningful participation by researchers and bird banders across the entire North American continent.

From a small project with only 16 cooperating stations in 1989 and just one harried field intern in Yosemite National Park in 1990, MAPS has grown into a continent-wide monitoring program with over 1,200 banding stations operating at some point during the life of the program. Under Dave's guidance, the program trained a generation of bird banders, whose data are widely used by IBP and others. Working with MAPS data, Dave and his colleagues have continually pushed the boundaries of mark-recapture analyses, frequently working with internationally prominent statisticians to incorporate the latest analytical procedures. Dave served as IBP's Executive Director

Hall Natural Area. Photo with permission © Yuichi Itoda

and Chief Scientist for 20 years. He stepped down from the Executive Director role in 2008 but has continued to serve as IBP's Controller and to provide leadership and vitality to IBP's demographic monitoring programs. He is taking another step closer to retirement this year by stepping down from his Controller role, but will continue to serve as IBP's President.

During his tenure at IBP, Dave has launched and overseen numerous other bird monitoring and conservation initiatives in addition to the MAPS Program. Highlights include a statewide census of California's Burrowing Owls in the early 1990's; the establishment and publication of *Bird Populations*, a scientific journal of global avian demography and biogeography; and the conceptualization and launching of the MoSI (Monitoreo de Sobrevivencia Invernal) Program, another cooperative network of mist-netting stations that monitor overwintering survival rates for both migratory and resident landbird species in the Neotropics. He also founded and served as the first Chairperson of the North American Banding Council, served as the President of the Western Bird Banding Association, and served on the editorial boards of *Western Birds*, *North American Bird Bander*, and *American Birds*.

Dave has spent the last four decades working tirelessly to further avian conservation in one form or another, and has been one of the field's leading

Dave on pelagic trip. Photo with permission © Don Roberson .

advocates for using demographic monitoring as a tool for understanding the proximate causes of avian population declines. He has produced well over 80 peer-reviewed publications on the reproductive ecology, population dynamics, and demographics of landbirds, as well as over 160 technical reports to various federal and state agencies, and has conceptualized and launched far-reaching avian monitoring programs that are vital components of contemporary avian monitoring in North America and beyond.

While the facts of Dave's professional service tell you a lot about his accomplishments, they don't really do justice to other aspects of the man - the way his face lights up when he hears the chip of a Wilson's Warbler; how his arms open for a hug to say hello; or his quickness to laugh, often at himself. It is an honor to work with Dave who has worked so tirelessly for the birds he loves so much.●

1988 Hall Ranch, Pt. Reyes. Photo with permission © Don Roberson .

Follow us on Facebook, Twitter or sign up for our "Contact Calls Newsletter." Enjoy news and interesting stories from IBP on a regular basis.

New in MAPSPROG

MAPSPROG, IBP's custom software for entering and verifying software, continues to evolve just as the MAPS program does. This year saw the addition of the bander's initial's fields as well as an update to allow data transfer to Bandit 4.0 (previously it only allowed transfer to Bandit 3.1). The program will continue to evolve with your suggestions, so keep them coming.

MAPSPROG can be used with any version of Windows from XP onward. Visit the MAPSPROG page to download the latest version.

The 2016 field season will mark the 28th year of the MAPS Program and we realized that there have been some very tenacious MAPS contributors that have worked with the program for over 25 years. That is an average of 175 before dawn treks out to net lanes per station! We salute these long standing partners here.

28 YEARS!

Palomarin; operated by Point Blue Conservation Science in Marin Co., CA since 1989. *Geoff Geupel, Emerging Programs and Partnerships Director (left); Diana Humple, Banding Coordinator, with Yellow-billed Cuckoo (right).*

Beaverhill Lab; operating near Edmonton, Alberta since 1989. *Beaverhill's banding lab.*

27 YEARS!

Hodgdon Meadow; operating in Yosemite NP since 1990. *NPS biologist Sarah Stock releasing a bird.*

Powderhouse Road; operated by Gail Kirch in Broome Co., NY since 1990. *Gail Kirch.*

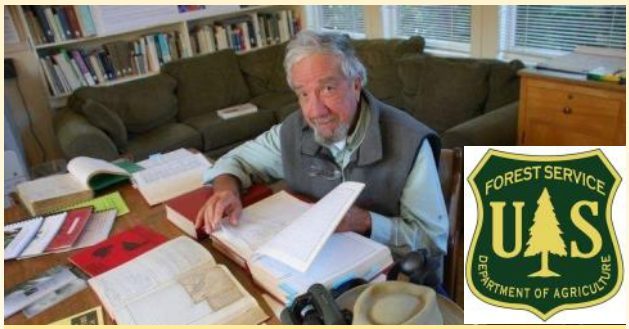
Dismal Swamp; operated by Donald Schwab and USFWS in Suffolk Co., VA since 1990. *Donald Schwab.*

27 YEARS!

Jug Bay Wetlands Sanctuary; operated in Anne Arundel Co., MD since 1990 by Jug Bay Wetlands Sanctuary. *Chris Swarth and Mike Quinlan ageing a banded bird (left); Danny Bystrak processing a bird.*

Hopewell; operated by Hannah B. Suthers in Mercer Co., NJ since 1990. *Hannah banding an Ovenbird.*

Pitsfield; operated by Brenda and Rich Keith at in Kalamazoo Co., MI since 1990. *Brenda and Rick Keith at banding site.*



Home and Park; operated in Humboldt Co., CA since 1990 and 1992, respectively by C.J. Ralph and the USFS Redwood Sciences Laboratory. *C.J. poring over data.*

Wells Reserve; operated by June Ficker and Wells Reserve at Laudholm in York Co., ME since 1990. *June Ficker and Northern Waterthrush.*

26 YEARS!

Warner Park Nature Center; operated in Davidson Co., Tennessee since 1991. *2015 Banding crew (top), celebrating 25 years! (bottom).*

Waterfall Glen; operated by the Forest Preserve District of DuPage Co., IL since 1991. *Brian Kraskiewicz and Glen Gabanski (top L), Scott Meister (bottom L), Glen Gabanski (right).*

Huntsman Marine A and Huntsman Marine B; operated in Charlotte Co., New Brunswick since 1991 by Tracey Dean and Huntsman Marine Science Centre. *Tracey processing a bird (left); Tracey out on the water (right).*

Teton Science School; started by Doug Wachob with the Teton Science Schools in Teton Co., WY in 1991; now operated by the Teton Raptor Center and Jennifer McCabe. *Doug Wachob (left), Jennifer McCabe (right).*

25 YEARS!

Innis Point; operated by Martha Caskey and the Innis Point Bird Observatory in Carleton Co., Ontario since 1992. *Martha Caskey with a surprise Cooper's Hawk (top); soggy MAPS crew after surprise rain shower during station shut down in 2012.*

Navarre Marsh; operated by Mark Shieldcastle and the Black Swamp Bird Observatory in Ottawa Co., OH since 1992. *Kim Kaufman and Mark Shieldcastle in front of the bird observatory.*

Montana Fish, Wildlife & Parks

Beartooth; operated in Lewis and Clark Co., MT since 1992 by Graham Taylor and Montana Fish, Wildlife and Parks.

Feather Collection 2016: Focus on Common Yellowthroat

As a part of our ongoing collaboration with the UCLA Center for Tropical Research on full annual cycle dynamics of landbirds, we are interested in collecting blood samples from the broad geographic range of Common Yellowthroat. If your MAPS station regularly bands this species, your required permits allow you to draw blood, and you are interested in participating in this project, please contact Steven Albert (salbert@birdpop.org) for details. Thank you!