



The INSTITUTE for BIRD POPULATIONS

MAPS Chat

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Photo by Doug Greenberg

MAPS Data Plays Key Role In Study On The Effect Of Shifting Spring Timing On Migratory Birds, Caterpillars And Trees.

When spring comes early or late, trees and caterpillars shift their schedules to match it, but migratory birds can't adjust as well.

Imagine you are on a cross-country bike trip from Florida to Vermont. You've pedaled for weeks, sustained by the thought of the massive maple-glazed cinnamon roll you'll eat at your favorite diner in Burlington. The diner closes for the summer in late May, so you've timed your trip carefully. Finally, you roll up to the diner, walk to the door on shaky, exhausted legs, and find a sign reading: "We've decided to close early this year. See you after Labor Day!" NO! This tragic instance of bad timing is what ecologists call a "phenological mismatch" -phenology refers to the timing of seasonal biological events. Migratory birds are experiencing phenological mismatch more frequently as warming trends lead to earlier springs.

Migratory birds travel huge distances to high latitudes to take advantage of the bounty of nourishing insects, especially fat caterpillars, that accompany spring in these regions. These insects provide the resources they need to feed their young, and arriving too late can be

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detrimental. Rather than merely a low blood sugar induced tantrum from missing out on your favorite maple cinnamon roll, birds that don't breed when the insect flush is in full swing may have fewer offspring.

A recent study in the Journal of Animal Ecology examined how changes in the timing of spring affects 3 different trophic



A male Common Yellowthroat with a juicy caterpillar. Photo by Nigel/Flickr.

levels in the eastern temperate forest of North America: trees, caterpillars, and birds. This study represents a large collaboration between researchers at 7 different institutions that relied on databases compiled by hundreds of individuals across the continent—including MAPS banders!

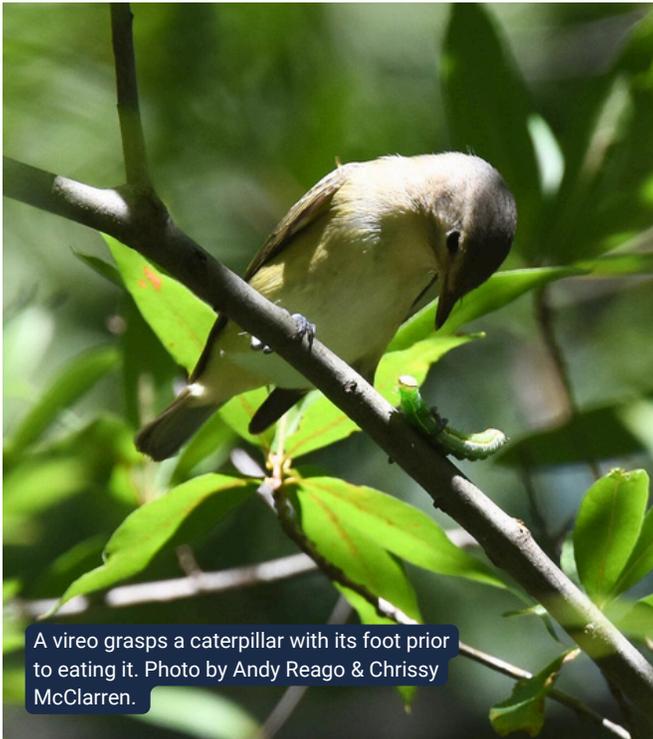
The study used 4 types of data to explore the relationship between the onset of spring, deciduous trees, the flush of caterpillars, the arrival, and the initiation of breeding by migratory birds between 2002 and 2017. The arrival of spring was quantified as the accumulation of "Growing Degree Days" or— a measure of the amount of heat available to plants and insects for growth. The researchers used MODIS satellite imagery from NASA to measure when trees began to "green-up" or leaf-out in Eastern North America at a 500m

spatial resolution. Citizen science data on butterfly abundance was used to estimate the emergence of caterpillars because there is little data that directly measures caterpillar phenology. The arrival of migratory birds was estimated using eBird data- another citizen science effort.

The timing of breeding for these migratory birds was calculated using data from the MAPS program- the researchers used the average date of capture across all juvenile birds of a particular species at a given banding location in a given year. Lead author of the study, Dr. Michael Belitz, says the MAPS data was unique in its spatial specificity:

The MAPS dataset was instrumental to this study and our estimates of the timing of breeding bird phenology would not have been possible without it. The MAPS dataset was also unique in our study, because it was the only phenological event that could be estimated at a precise spatial resolution. Due to the unstructured or semi-structured format of the data used to estimate Lepidoptera emergence and bird arrival, we needed to aggregate data to large hexagonal cells. However, breeding phenology could be estimated at a station-specific resolution due to the repeated and standardized protocol being followed by MAPS banders.

The study found that trees and insects tracked the timing of spring pretty closely. If enough growing degree days accumulated earlier than in a typical year, trees were able to leaf out early, and butterflies and moths reproduced earlier. This makes sense because plants and insects are ectotherms and sensitive to local temperatures. Migratory birds, however, are traveling from the non-breeding grounds and not experiencing



A vireo grasps a caterpillar with its foot prior to eating it. Photo by Andy Reago & Chrissy McClarren.

Belitz notes that a study involving this many groups of organisms across this large a geographical area is only possible because of a huge collaborative effort.

Previous work has documented that forest green-up, Lepidoptera (butterflies and moths) emergence, and bird phenology have been responding differently to climate change. However, these studies have largely occurred at smaller spatial scales because data on insect phenology is scarce. Our study draws upon techniques that have been developed by co-authors of the study working on forest, insect, and bird phenology for over a decade. By leveraging a decade of collaborative experience, we were able to take a data synthesis approach to compare how much the timing of forest green-up, Lepidoptera emergence, migratory bird arrival, and bird breeding has changed in response to changes in spring temperature accumulation across eastern North America. Our results add to the evidence that birds are not tracking climate changes to the same degree as insects and plants, particularly in northern latitudes.

conditions on the breeding grounds. Their timing is more dependent on proxy clues to conditions on the breeding grounds, like day length. If spring came early, they arrived earlier and bred earlier, but not earlier enough to align well with the caterpillar boom.

Study co-author Dr. Casey Youngflesh says that this study is one of the few to examine phenology across three trophic levels- most only consider one or two levels. One of his previous studies that examined two trophic levels, trees and birds, found that across North America, bird breeding phenology did not keep pace with changes in the timing of spring green-up and that phenological mismatch resulted in lower reproductive output in the birds. The addition of a third trophic level- insects- in the current study is critical, says Youngflesh, because the link between birds and caterpillars might be more concerning than the link between caterpillars and plants, in terms of any decoupling in the timing of seasonal events.

This study highlights the critical importance of reversing insect declines, not only to conserve



Catalpa Sphinx Moth caterpillars. Photo by Andy Reago & Chrissy McClarren

insects themselves but also to support healthy bird populations. Another [recent paper in the journal Science](#), found that total butterfly abundance in the US declined by 22% between 2000 and 2020. Phenological mismatch has been proposed as one of the possible causes of widespread population declines of both birds and insects. To better understand its role, and what we can do

ameliorate its effects on these species, we need to gather more long-term data on insect phenology and abundance on large geographical scales. We also need to continue collecting critical bird demographic data through the MAPS program. The MAPS database is a unique dataset that is increasingly used by researchers investigating a wide variety of conservation questions.

How is MAPS Data Being Used?

Since the [MAPS Data Exploration Tool](#) went online in 2023, increasing numbers of scientists and other professionals have put the data to work. The phenology study by Belitz et al. discussed in the previous article is a great example. Dr Allyson Jackson used MAPS data to plan bird monitoring for Acadia National Park. "The MAPS data has been really helpful in helping us develop a plan for long term monitoring in Acadia National Park. Being able to see the capture rates and species counts of nearby MAPS stations and then compare with potential sites in Acadia really helped focus our planning. I think the best part was that it came so quickly - I literally downloaded it from the field house, and had information for the next day of field site surveying. Here are some other examples:

- To compare survival between males and females in more than 30 bird species.
- To examine the effects of pollution on the reproduction



This photo of a Grasshopper Sparrow singing in the rain won 2nd place in the 2024 MAPS Photo Contest. It was taken by William Petrie and submitted by the Innis Point MAPS station near Ottawa, Ontario.

and survival of aerial insectivores.

- To plan Motus tower deployments
- To inform State Wildlife Action Plans in Idaho and Utah for bird species of greatest conservation need.
- To explore landscape and climate drivers of molt phenology.

MAPS in a Nutshell Video



IBP has produced a short video (less than 5 minutes) about the MAPS Program that you can share with visitors to your banding station or anyone else interested in your work. Use the QR code below to view the video on YouTube. You can also watch it on the MAPS program page on our website or by clicking this button:



2ND ANNUAL MAPS PHOTO CONTEST

We want to see MAPS banders in action and share your important work with the world! Of course we love photos of birds- they are the stars of the show- but we also love photos of banders! Whether it's a posed group photo or a candid shot of your team hard at work at the banding table we want to see the people of the MAPS community too. You can photos from the winners of last year's contest sprinkled throughout this issue and gathered together on page 22.



The 5 top-rated photographers will receive their choice of an IBP hoodie OR a copy of the 2nd (new) edition of Peter Pyle's *Identification Guide to North American Birds, Part 1*. **Entries are due by Sept. 1st, 2025.**

You can submit photos individually or in batches of 10 using this [FORM](#). To upload photos using the form you will need a Google (Gmail) account. If you don't have a Google account, and don't want to create one, PLEASE FILL OUT THE FORM & SUBMIT IT ANYWAY so that we have your information. Then email your photos separately to Meredith at mwalker@birdpop.org.

By submitting your photos you are giving IBP permission to use them—with attribution to the photographer—on our social media accounts, and in newsletters, reports and other publications.

To be eligible for a prize in the contest, photos must meet IBP's guidelines for public-facing communications. To read the guidelines, click this link [MAPS Photo Contest Guidelines](#).

If you have any questions, please email IBP's Communications Specialist, Meredith Walker, at mwalker@birdpop.org.

An Introduction to MAPSNet

This new tool for cleaning and verifying MAPS data will replace MAPSPROG

Happy retirement to MAPSPROG! After 25 years it's had a good run. Starting this year, we have a new program, MAPSNet, for uploading MAPS data. We talked to MAPS Program Coordinator, Danielle Kaschube, about the new system.

1. What is MAPSnet?

MAPSNet is a cloud-based program for cleaning and verifying MAPS data. Users upload their data from a spreadsheet/CSV file, and effort, banding, and breeding status data are all reviewed to ensure there are no data conflicts. If they exist, the program prompts the user to correct them.

2. Why was there a need for MAPSNet?

Scientists always need clean data to analyze, and we all make mistakes in the field, so there

needs to be a way to check data. MAPSPROG was the previous iteration of IBP's data cleanup system and did clean data. Still, it was written in fairly old code, was difficult to update, couldn't be used by MAC operators, and could no longer be installed on many federal or state computers with increasing computer security protocols. MAPSNet is also more user-friendly and does a great job of data cleanup.

3. How does MAPSNet benefit MAPS operators?

In addition to helping operators fix data conflicts and create the best data set possible, the system provides opportunities to learn. Errors are conflicts that must be resolved in the system, but there are also warnings that help operators know how to adhere more closely to MAPS protocols and learn more about the



This photo of a bander examining the tail of a Magnolia Warbler won 4th place in the 2024 MAP Photo Contest. It was taken by Anne HusVar and submitted by the Buffalo Audubon Arboretum MAPS station near Buffalo, NY

biology of the species they are working on. After verification, MAPSNet also provides files that can be uploaded to the banding offices' Bander Portal without needing modification.

4. How does MAPSNet help IBP maintain the MAPS Database?

The MAPS database will be more up-to-date because the data will be pulled into the larger database, which will come in cleaner. Because more operators will be able to use MAPSNet compared to MAPSPROG, less IBP staff time will be required to verify data, and more time will be available to help operators and analyze data. A more up-to-date database allows scientists, both at IBP and externally, to make conclusions based on more recent and relevant data.

In the past, when we received raw data, an IBP staff member had to run the data through all the verification steps. Even MAPSPROG data had to be double-checked. All of this took time. The new system does all of those checks and balances automatically, so there is no delay between data submission and usability.

5. How do MAPS operators access MAPSNet?

MAPSNet can be found at:
<https://mapsnet.birdpop.org>.

Once an operator's pre-2024 data is pulled into MAPSNet, the operator is sent a password so they can access their data. If an operator is ready to pull in their 2024 data, they email MAPS Data Manager <mapsdatamanager@birdpop.org>. Their name and location are added to the list of operators, and the MAPS team will, as quickly as possible, pull in their older data. This might take a couple of weeks because we are a small team and have a lot of data to work through, but we are

working as fast as possible. If there is an urgent need to have access to your data, e.g., your permit renewal requires data submission to the Bander Portal before renewal, call Dani at (609) 892-0445, and she will put you on the fast track.

6. How can MAPS operators get help with MAPSNet if they need it?

For the most part, inquiries should be sent to the MAPS Data Manager at mapsdatamanager@birdpop.org. We will answer them as soon as we can. We can look at any data you have uploaded, so we should be able to see the data exactly as you are seeing it. However, if there is an urgent problem, please call Dani at 609-892-0445.



This photo of a bander holding a Golden-winged Warbler won 3rd place in the 2024 MAPS Photo Contest. It was taken by Isabel Martinez, and submitted by the Carpenter St. Croix Valley Nature Center MAPS station near Hastings, MN.

To preempt the most common problems, operators should check the following: 1) Make sure the headers of the import file match the Excel data entry template. This is currently found at the bottom of the MAPSPROG webpage but will soon migrate to the MAPSNet information page on the IBP website. 2) Ensure the location and station fields are filled in for all records. And 3) Ensure the date field is filled in for every record.

We are very excited to introduce MAPSNet, and operators who have used it have given positive feedback and suggestions for future upgrades. Those who have used both MAPSPROG and MAPNet say that MAPSNet is a significant improvement.

That said, this is a new program, and there are likely things that may cause some users problems and prevent them from advancing through the program. Please let us know about these, and we will address them as soon as possible. If there is something that you think will improve the program, let us know that, too.

We are transitioning the website from MAPSPROG to MAPSNet, but you can submit your 2024 data through MAPSPROG if you are already in that system. The last update of MAPSPROG was the one for the 2024 season.



This photo of a bander examining an American Robin won 5th place in the 2024 MAPS Photo Contest. It was taken by Marie-Pierre Paradis-Claes and submitted by the MAPS station at the Rocky Point Bird Observatory, Victoria, British Columbia.

MAPSNet How-To Video

For a detailed guide to how to use MAPSNet, check out this video tutorial presented by MAPS Program Coordinator Danielle Kaschube. You can watch on our [website](#) or on [YouTube](#). The QR code at right will take you to the video on YouTube.



A Man of Many Talents

Meet Joe Weiss, frequent IBP collaborator and the software wizard behind MAPSNet and more.

For almost 2 years, IBP scientists have had the pleasure of collaborating with a man of many talents, software developer Joe Weiss. In late 2022, IBP Acoustic Avian Biologist Jerry Cole needed to scale up our audio processing capacity and knew that cloud computing would be a good option.

“At the time I had some tools that I had built, but it wasn't a unified system, which is what I wanted. However, there weren't any prebuilt options to run BirdNET (Cornell Lab of Ornithology's research platform for detecting and classifying avian sounds using machine learning) on the cloud,” says Cole.

“Through some poking around I discovered birdnetlib, written by Joe, which simplifies a bunch of BirdNET operations in Python, and thought I'd see if he would be interested in building a web interface for processing our audio. Luckily Joe was excited to build that tool!”

And so “AudioDash” was born. AudioDash can classify bird species within large amounts of audio data, organize and store those results, and provide an interface for reviewing particular subsets of identified recordings. AudioDash has helped IBP expand our bioacoustic work significantly- we now have about a dozen projects using audio data.

Joe was so great to work with on AudioDash, we quickly talked him into another project: MAPSNet! MAPSNet (see page 6) is a software application that will make it easier for MAPS operators to submit their bird banding data while streamlining the extensive data verification process we use to ensure that the data are as close as possible to error-free and are ready for mark-recapture analysis.

Joe agreed to a brief interview so we can introduce the talented guy who has helped IBP elevate our work in the last couple of years. Thanks Joe!

Where do you live?

I live in Greenville, N.C., about an hour from the Atlantic Ocean. I grew up on the ocean; a lot of my family members were commercial fishermen.

How do you describe your occupation?

I think of myself as a software developer who works mostly with sound and data. I work under the



Photo courtesy of Joe Weiss

umbrella of my small consulting company, Tungite Labs.

How did you get involved with IBP?

When the pandemic lockdown started, I had a bit of free time, and I wanted to build a device that would alert me if a Mississippi Kite (spark bird!) was calling nearby. So I wrote a Python library for Cornell's BirdNET model and used the new library as part of a system to monitor our yard. To this day, my wife Stacy and I still get a text whenever a MIKI is vocalizing near the house.



Mississippi Kite. Photo by Donald Edward Odom Jr

Were you interested in birds before getting involved with IBP?

Absolutely! I was into birding, but the work with IBP has been miles beyond where I thought I'd go with birds. Now I band birds at a banding station once a month, regularly deploy my own set of ARUs (autonomic recording units), and generally think about the intersection of software and birds all the time.

You even took one of our bird banding training classes! How was that?

I attended the Beginning Bird Banding workshop this past June with IBP's MAPS Coordinator, Dani Kaschube, at Wolf Ridge Environmental Learning Center in Minnesota. As part of the MAPSNet project, I needed to better understand the data on a MAPS data sheet, especially when implementing the many existing validation routines for the new system.

BP, CP, HA, HS, etc.—before the class, I saw these as just variables in a Python object to be populated, formatted and verified. Now, I see more of the bird that those variables represent.

The class was incredible. Dani broke everything down in a way that even a complete beginner like me could understand. Before this, I had never held a bird in hand.

Next thing I knew, I was blowing all over an Ovenbird looking for molt and checking out its brood patch.

After getting back home after the class, I have been able to continue banding one weekend a month with a project in North Carolina. I still have a lot to learn, but it's been an amazing experience, and the MAPSNet verifications now make so much more sense. I think the best software is created by people who actually use it, and I'm lucky to count myself as a bander now.



Photo courtesy of Joe Weiss

How do you like working with IBP?

I absolutely love creating software and learning about birds, so working with IBP hits all my bliss points. Also, the people I work with are truly delightful! For most of 2024, I've been meeting regularly with IBP Biologists Dani Kaschube and Emma Cox, and a few months ago, Lauren Helton began joining us as well. I've greatly appreciated their patience and generosity as they've guided me through my learning curve with MAPS and the Pyle guide data. I've learned so much from them.

Have you always worked in software development?

Software development is actually my second career. I was previously a photojournalist and editor, working on staff for MSNBC and McClatchy Newspapers. I've had assignments all over the U.S., Mexico, Nicaragua and Peru.

I've worked with all kinds of data as a software developer since I left journalism in 2006. Some of that data has been financial or textual, but there's been a lot of audio, video and image data as well. The work with IBP is the first time I've worked with natural sciences data. I've worked as a developer, manager, and CTO with start-ups, but I enjoy working with smaller organizations in a developer role—it's where I find the most fulfillment and excitement in my work.

I've enjoyed the diversity of my client work, shifting domains from accounting data and analytics to creating design and video production software. Now I'm happily bird-focused. A year ago I handed off all my non-bird related clients and I've been able to work exclusively on bird-focused software development. Not all of the work is public yet; it takes time to develop and document open source software.

What do you like to do when you're not performing software wizardry?

Birds used to be my hobby, but now they're apparently a load-bearing component of my personality. I also play several musical instruments and enjoy learning new ones. I play the ukulele most often, largely because it's convenient—I have them scattered throughout our home. I also enjoy making field recordings of quiet places. My favorite recording is from the Quinault Rain Forest on the Olympic Peninsula.

Stacy and I share a love for camping and hiking, and we travel as often as our schedules allow. She also took Dani's class in Minnesota in June, and is banding here in N.C. as well.

Any regrets now that we have sucked you into working with birds and bird data?

Only that I wish I would have started doing this sooner. It feels surreal to be able to combine two passions into meaningful work. I feel guilty at times.

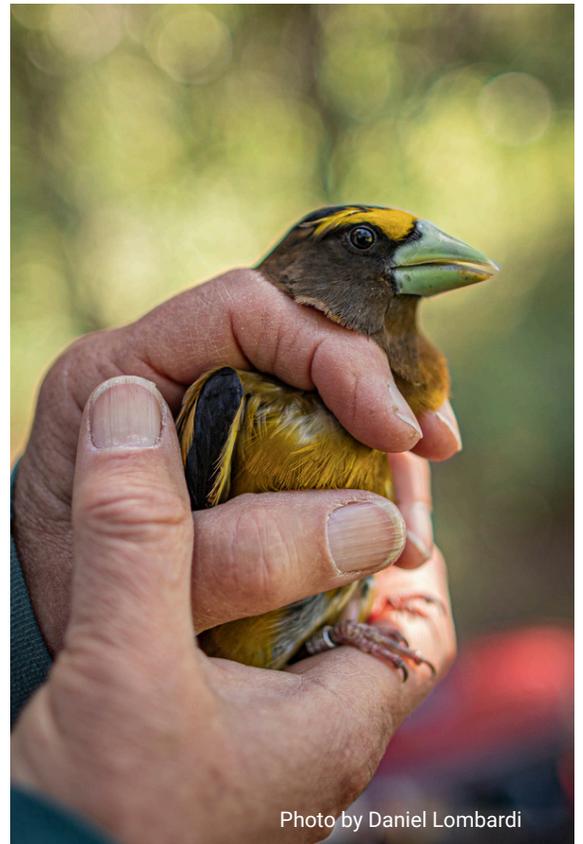


Photo by Daniel Lombardi

Rota is here

An update from our farthest flung
MAPS stations

by Mietron Shahbodaghloo



Before jumping into all the exciting details, let me take a moment to introduce myself and the incredible crew during the first wet season on Rota. My name is Mietron Shahbodaghloo, and I had the privilege of working alongside Lindsey Doyel and Lauren Helton the Sept.-Nov. 2024 season. This season coincidentally turned out to be a little island reunion for all of us! Lauren trained Lindsey and me during the summer of 2023 in Yosemite National Park as part of the MAPS bird banding crew. We all departed for Rota on September 1st and arrived after a few travel days on the 3rd. If you thought us all meeting in 2023 was a coincidence, you'd be surprised to learn we all had September birthdays! What better way to celebrate and kick off the field season than with birthday celebrations at the annual Luta Coconut Festival?

This vibrant celebration honors the "tree of life," a symbol deeply rooted in the Marianas. The coconut is culturally significant, as it provides food and materials that helped the ancient Chamorro and Carolinians thrive in the Marianas. The festival showcased delicious local food, lively cultural dances that highlight the island's heritage, and of course, the much anticipated umang (hermit crab) race! Participants picked out their favorite umang and placed it in the center of a circle. The first one to cross the circle's boundary, wins! I was pleasantly surprised to learn that they're



Photo courtesy of Mietron Shahbodaghloo

actually much faster than anticipated. I want to thank the Mar.-May 2024 crew, Kristin Attinger and Axel Rutter, again for all their incredible hard work establishing our six banding stations! They truly put in so much effort clearing lanes in the dense jungle which certainly made our first month on Rota a breeze. As a result, we had very little clearing of vegetation to do. Thank you, truly!



An umang or hermit crab reaches the finish line. Photo by Lauren Helton



A Rota White-eye (*Zosterops rotensis*) or "nosa' luta" feeding on a grub in the high canopy. Photo by Mietron Shahbodaghloo.

Last season, the crew caught three individual nosa' luta (Rota White-eye), but we had no idea what the wet season might bring. To boost our chances of nosa' DNA sampling, we decided to implement "double tall" mist nets. By stacking two standard mist nets onto 20-foot painter's poles, we had hoped to elevate our chances to capture these tricky high-canopy dwellers. We focused most of these



Lindsey and Mietron setting up a double tall mist net for the first time. Photo by Lauren Helton.

taller nets at Isang, where the high-elevation cloud forest is the perfect habitat for nosa'. However, we also tested this setup at a lower elevation site, Malilok, where we've seen nosa' using the high-canopy previously. We had originally planned to set up mist nets in a lower canopy section that the nosa' use near Isang, but the fanihi (Mariana Fruit Bat) started using the area heavily. To avoid disturbing them, we decided to hold off this, leaving the opportunity for future crews to try this spot out.



A Mariana Fruit Bat or "fanihi" soaring through the sky. Photo by Mietron Shahbodaghloo.

Despite our efforts to increase nosa' capture rates, they managed to outsmart us once again! We caught two nosa' luta, one of which was in the top of a double-tall net. So, I like to think we doubled our capture rate this season thanks to the new taller nets.

Who would've thought we'd get a truck stuck in the mud during the wet season? (Okay, probably everyone.) It was a particularly stormy morning when we left our house around 5:20 am to head over to Malilok. As I was driving down the island's south side dirt road, something felt a little off with the truck. We had just made it past the steepest part of the road, so I thought we were in the clear. But as we turned onto this little side road that sees virtually no traffic, the truck started sliding off the road. Thankfully, it wasn't too steep here, so I had time to slow the truck to a stop so we could figure out what to do next.



Lindsey crafting a stick road to get the truck out of the mud. Photo by Mietron Shahbodaghloo.

Of course, this part of the island has zero cell service, and locals typically don't visit this part of the island, so we were on our own. With no way to back out uphill, Lindsey and I decided the only option was to keep going down and try to turn around. After a few failed attempts using ropes to pull the truck, we realized we needed to get creative. We settled on a makeshift road crafted out of sticks to help us get some traction until the road got flat again. In total, this took about 2-3 hours away from our morning. But hey, we managed to get enough banding hours in while still getting home at our usual time! A win in my book.

In total, we saw less captures overall compared to the dry season. We captured, banded, and released 250 of Rota's resident birds while Kristin and Axel had 348 birds during the dry season. However, it is important to note that we experienced more frequent bad weather and shorter banding days as a result. Thus, these lower numbers don't necessarily reflect declines in the populations here on Rota. We did notice similar trends to the dry season in which our captured birds were often full adults. With a season of dry and wet data as a baseline, future years on Rota will allow us to start answering questions regarding reproductive and survival trends. This season, we dove deeper into the little details surrounding sãli (Micronesian Starling) sexing. On the nearby island of Sapain, birds were often reliably aged through wing length

differences. However, the crew last season found that this might be unreliable here on Rota. As a result, we looked for a new morphometric that could help distinguish male from female sãli breeding conditions aren't present. Lindsey and I noticed that bill measurements may show some promise, but we'll need a few more seasons of data to definitively tell. You may have heard, but sãli love to bite incredibly hard. Now imagine having to put your hands near that bill to get the measurement. Not fun. But we love them nonetheless.



The Sãli, or Micronesian Starling, has a sturdy beak resembling a crow's. Photo by Tony Morris.

We also added a new species to the list of birds captured here this season! The Philippine Collared-dove is an introduced species, however, it is declining in much of its native range. Similar to the Black Drongo, this dove prefers grasslands, farmland, and village habitat on the island, so it's a rare visitor to our

forested banding sites. Like the Black Drongo, their impact on Rota's native bird populations is not fully understood. While we may not catch many during our time on Rota, we will make an effort to take detailed notes. Any information we gather can help us learn about their impact on native bird populations.

All in all, it was another successful season here on Rota. All the rain couldn't bring us down, even if the tropical storm on our final day really wanted to! With our first full year of data collected, future years will continue providing invaluable data to help us understand the trends we are already starting to see. With the next dry season already underway, we look forward to seeing what new discoveries await. Fingers crossed the nosa' are a bit more cooperative this time!



A bander holds a Philippine collared-dove as part of scientific documentation. Photo by Mietron Shahbodaghloo.



This photo of a bander releasing a bird won 1st place in the 2024 MAPS Photo Contest. It was taken by Daniel Lombardi at the Glacier National Park MAPS station in MT.

MAPS Station Profile:

Empire Ranch in the Las Cienegas National Conservation Area in southeast Arizona

by Adam Hannuksela

Photo by Bob Wick/BLM

The MAPS station at Empire Ranch (EMPI) is located in the grasslands of southeast Arizona in the Las Cienegas National Conservation Area managed by the Bureau of Land Management. The station is in a beautiful riparian area in Empire Gulch, a globally recognized Important Bird Area. The riparian area is within a varied Chihuahuan grassland landscape and it offer valuable habitat for hundreds of species. The area is an important breeding ground for Endangered species such as Willow Flycatchers and Yellow-billed Cuckoos. The riparian habitat yields many captures of eye-catchers like Vermillion Flycatchers, Yellow Warblers, and Blue

Grosbeaks. Wild Turkeys, bats, and Javelina also favor the riparian habitat and do cause some occasional net damage.

Marcia Radke of the Bureau of Land Management initiated EMPI's operations in 2002. The station missed a few years of operation throughout its history due to a lack of available banders at times and restrictions during the COVID-19 pandemic. After a three-year break, our crew revived the station in 2023, continuing the legacy of this long-running station.

Some of the more common species captured over the station's history include Black-chinned Hummingbird, Black Phoebe, Bewick's Wren, Lucy's Warbler, Yellow Warbler, Common Yellowthroat, Yellow-bellied Chat, Summer Tanager, Song Sparrow, Blue Grosbeak, House Finch, and Lesser Goldfinch.

The number of banding stations in the southwest has been decreasing. The Sonoran Joint Venture (SJV), Tucson Audubon Society, and the Bureau of Land Management wanted





Photo by Wendy Miller

with studies of other researchers who are not able to capture birds that are of interest to their work; and, we can assist with blood sampling, tick collection, and other research projects. A comprehensive analysis of the data is planned for the near future.

Since its inception in 1999, the SJV has been committed to supporting coordinated bird monitoring. By contributing to the MAPS program, we can contribute to one of the most valuable monitoring programs in the world. Long-term monitoring is of increasing importance as we deal with the biodiversity crisis.

to do something about that. They believed it would be helpful to restart a long-running station that not only contributes an important bird monitoring program (MAPS) but could also be used to increase capacity for training and outreach in the region. There are plans to use the station to assist with Motus tagging and a planned Motus station at the historic Empire Ranch. Due to EMPI's convenient location on public land, we can host many visitors, which is a great way to help expose people to banding. In this region, there are fewer qualified banders than in the past, and we hope to help address this capacity shortage to complement Motus work and help build the pool of banders. The data collected at MAPS stations can: help land stewards make more informed decisions; provide an opportunity to integrate with researchers both locally and regionally; help



Photo by Mick Thompson



Adam Hannuksela, science coordinator for the Sonoran Joint Venture (sonoranjv.org) is the bander at the Empire Ranch MAPS station. He has been banding since 1999, and for 14 years, he ran a MoSI station in Sonora, Mexico, that is still in operation. He has taught banding classes throughout the American West, western Mexico, and Guatemala.

A Bird in the Hand is a Photo Opportunity- Don't Miss It!

How to take and catalogue images of hand-held birds- by Peter Pyle



The value of digital image catalogues to study birds these days really cannot be overstated, especially when it comes to molt patterns and age determination, historically neglected topics in ornithology. For example, I examined over 25,000 images at the Cornell Lab of Ornithology's Macaulay Library to overhaul molt, age, and sex determination criteria for the eight species of hummingbirds that occur along the Mexico-U.S. border ([here](#)). Now, in my capacity of editor for the Plumages and Molts sections of Cornell's Birds of the World, I get to do this for species around the world. Just this month, for example, I used Macaulay to figure out molt and ageing for Black-throated Huet-Huet, Scarlet Ibis, Band-bellied Owl, White-capped Albatross, and See-see Partridge, among other little-known and a few well-known species. What could possibly be more fun?

Taking images of in-hand birds

I have also reviewed thousands of images taken by banders during our Boreal MAPS (BMAPS) program in northeastern Alberta (part of our overall [MAPS Program](#)). This has helped us feel rather confident about micro-ageing these birds and, subsequently, applying SY:ASY ratios to show that, for example, yearling breeders are forced into suboptimal habitats during their initial breeding attempt ([here](#)). As a rule, BMAPS banders take three images of each bird (time allowing), an open wing shot, an open tail shot, and a side shot of the bird in the bander's grip. Other shots, e.g., of the crown from above or both wings for molt symmetry can be taken if important. All three images are useful in different ways for ageing, although as we all know, that open-wing shot is where most of the action lies. We have learned through the 15 years of this project some useful do's and don'ts for obtaining the best images for the study of molt and determination of age and sex:



Figure 1. The best open-wing images are taken in well-lit shade against neutral-colored backgrounds. It is easy when two banders are present, and the second person should pinch the outer primary about 75% of the way out, and stretch the wing so that all feathers are visible. In this case, the molt limit among greater coverts is nicely visible in this October HY Western Bluebird, captured for banding in Durango, Mexico. Photo: Peter Pyle.

- Take images in well-lit shade. Images in the full sun and, especially, in contrasting or dappled lighting are far more difficult to analyze. If it's sunny out you can shade the bird with your shadow

and take the image that way. *Avoid using camera flashes*, unless you really know what you are doing.

- Take the image against a neutral background. Some banders bring or set up a neutral gray or brown backdrop for hand-held images and this works well. Some even have a light box or set-up for this. Apart from these, try and find a solid neutrally-colored background for your images. Avoid bright backdrops such as the sky. I've had good success squatting over a patch of brown dirt.

- Make sure all feathers are visible on the open-wing image. It is easiest to take open-wing shots with two banders but many have perfected a technique of pinching the wing joint between two middle fingers and getting good images solo. When two are present, the helper should pinch the outer primary about 3/4ths of the way out while the bander holds the bird and takes the image. This is the best way to have all wing feathers visible. The primary coverts are often the key feather tract for ageing, so be sure not to cover these up with your thumb or (when going solo), your finger tips. It is also good to smooth out any disheveled tertials or secondary coverts before taking the image as these are important feather tracts as well.



Figure 2. The best way to take open-wing images solo is to pinch the bird's wrist ("shoulder") between two middle fingers. Note the well-lit shade and even, neutrally colored background. Study of open-wing images can lead to new insights about bird molts, such as eccentric molt occasionally being found in this SY Great Crested Flycatcher captured in May. Braddock Bay Bird Observatory, photo: Peter Pyle.

- Make sure the primary coverts are visible on the bander's-grip shot. This has proven especially useful, as when the barbs on these are spread too widely on an open-wing shot they can look more like juvenile feathers when they are not. The side-view shot of both the primary coverts and outer greater coverts can serve as a critical cross-check for the presence or absence of a molt limit, as ascertained in the open-wing shot. A caution that the primary coverts can be covered by the scapulars or flank feathers in a photo-grip shot.

- Take an underwing shot. The color and patterns to underwing coverts are very poorly known, due in part to lack of access on round-skin specimens. The retention of these but no other juvenile feathers by HY/SY blackbirds provides a fascinating ageing criterion, stumbled upon by chance during a blackbird control effort in the 1960s. Might it occur in other species with otherwise complete preformative molts? In my Birds of the World sections I seek Macaulay shots of the underwing to show and describe. These are easy to find for soaring birds such as hawks and

vultures, but not for species like rails, antpittas, and wrens! So an in-hand shot of the underwings from your banding station will prove quite valuable. The University of Puget Sound's [Wing and Tail Image Collection](#) is the best current catalogue for underwing coverts.

Naming your hand-held images

For our Boreal MAPS program we have come up with a standard naming system for each image file, as: <SPEC>_<BAND>_<AGE>_<SEX>_<YYYYMMDD>_<STA>_<body part>, the last bit being "wing," "tail," or "body." This allows the sorting of images by individual bird, which can help us track between-year captures and ages.

Some may want to put <AGE> before <BAND> to sort birds into age categories instead. It might depend on the goal of your studies but, in any case, it will be useful to standardize this as much as possible for future searches and import into database files. The file name will not matter so much, however, for images correctly contributed to on-line catalogues.

Cataloguing your hand-held images.

The first successful attempt to provide examples of hand-held images on line was developed by Marcel Gahbauer with the [McGill Bird Observatory](#) in Quebec. Marcel also added useful text on how to distinguish the ages and sexes in both spring and fall. Pages for about 50 species were included and this was the first "go-to" resource for banders of images of different age or sex groups.

Marcel's pages have been moved to the site [Piranga](#), where his notes and images have been preserved. The site includes six regions of the world and allows the continued addition of images accurately determined to age and sex. [Here](#), for example, is the page for [Baltimore Oriole](#). To use Piranga you need to establish an account with them, but this is free and easy to do, and they have an instruction page on how to upload images ([here](#)).

Another effort has been initiated through iNaturalist by Erik Johnson at the Louisiana Bird Observatory. It is established as an iNat [Project](#) for which, so far, 14 people have contributed almost 1000 images of 120 species, and there is another iNat [Project](#) to expand this concept globally (currently over 3000 images of 563 species). iNaturalist allows searching for species or other elements, for example, [here](#), and, e.g., for Baltimore Oriole on the global site, [here](#).



Figure 3. Analysis of the primary coverts in photo-grip ("body") images can help supplement what we see in the open-wing images. Make sure the primary coverts are visible, as in these two shots, of an AS Y Alder Flycatcher in May with black basic primary coverts at Braddock Bay Bird Observatory (left) and an SY with brownish juvenile primary coverts that contrast with replaced formative greater coverts. The SY image was taken in July during our Boreal MAPS program and was given the file name "ALFL_263069727_SY_M_20120702_BISN_body.jpg", the standard naming system we use in the program. Photos: Peter Pyle (left) and Boreal MAPS Program catalogue (right).

I have not contributed to Piranga (although Marcel has some images contributed for me) and I use iNat sparingly, mostly for plants, insects, mushrooms, and other critters, so I don't know these sites as well as I know the [Macaulay Library](#). But I can at least vouch for Macaulay in terms of sheer numbers, over 72 million bird images contributed so far, and growing fast. The Macaulay Library accumulates images contributed by users of [eBird](#), so to contribute you will need to sign up, but I've found this to be a user-friendly program in all regards and I use it a lot to contribute "Checklists" and images summarizing my field-birding efforts. Once you establish your banding station as an eBird location, it is easy to repeat and add photos. And although you need to sign up for eBird to contribute, anyone can use and look for images in the catalogue, and they have a fantastic filtering system (by state, county, month, age, sex, etc., even whether a bird is molting or not!). Importantly, eBird and Macaulay have added a check-box and filter labeled "In-hand" for banders to enable filtering for these images. Here are the Macaulay images for [Baltimore Orioles in hand](#), for example (179 images total at this point).



Figure 4. Underwing coverts are the least-known feathers in landbirds due to the inability of past ornithologists to study them in round-skin specimens. On this SY Red-winged Blackbird (in May), the retained juvenile underwing primary and greater coverts are the only feathers retained during preformative molts, and the contrast between these and the black replaced median and lesser coverts provides the best means of aging blackbirds. Might other species with complete preformative molts otherwise (e.g., Northern Cardinal, Bushtit, Grasshopper Sparrow) also retain underwing primary coverts? Taking in-hand underwing covert shots of all of your birds and contributing them to digital catalogues will be the best way to find out. Braddock Bay Bird Observatory; Photo: Peter Pyle

I don't know how the age systems work at Piranga or iNat, but at Macaulay they are fairly rudimentary, choices being "juvenile," "immature," and "adult." Generally, banders will know to put HY/SY birds into the "immature" category and reserve "juveniles" for those that have not begun the preformative molt yet, but it would be nice if the age designations were more specific, especially for woodpeckers, gulls, etc., species in which up to 3 or 4 "immature" cohorts can be aged. On the plus side, each image has the ability to add labels. I have seen users already inputting both BBL and WRP codes into the labeling, and I recommend banders do this. A couple of cautions when viewing the images filtered for age and sex: 1) not all images of that age/sex class are flagged as such, sometimes you need to take the filters off to find additional images, and 2) not all images are aged and sexed correctly! Still, these features are very useful for finding images and analyzing molts and plumages. [Here](#) for example, are 79 Baltimore Orioles flagged as "immature male."

There is talk at Cornell of using digital technology to determine age and sex of birds in images, as their program Merlin now does with identification (and iNat does for everything!). When I first heard about this they added that it would increase my job security, to which I responded, "are you sure about that?!" Regardless of my job security, this could be an exciting new avenue for banders. iNaturalist has an app called "Seek" in which you simply hold your camera up to a critter and it identifies it for you. What if we had such an app for banders to instantly determine age and sex based on in-situ images of spread wings?

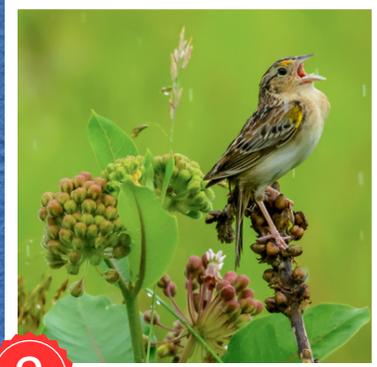
Piranga, iNat, and Macaulay all have their advantages and disadvantages. As one who is incaltrant about learning new programs (I still use Office 2003 on Windows 7 and am completely lost on my iPhone), I encourage you to continue with what you are most familiar with, or try each out to see which one best fits your particular mental bent. The way things are going, someone soon will invent an umbrella program to combine all three catalogues at one search site. The bottom line, please do consider taking hand-held images and contributing them to one of these sites. It will greatly help future banders (not to mention banding apps) progress with accurate age and sex determinations for important demographic studies using MAPS and other data sets.



1

Daniel Lombardi, Glacier National Park, MT see page 15

2024
MAPS
Photo
Contest
Winners



2

William Petrie,
Innis Point, Ottawa, ON
see page 4



3

Isabel Martinez, Carpenter St. Croix Valley Nature Center, Hastings MN see page 7



4

Anne HusVar, Buffalo Audubon Arboretum, NY see page 6



5

Marie-Pierre Paradis-Claes,
Rocky Point Bird Observatory, Victoria, BC
see page 8

New MAPS operators have joined the flock!

Welcome!



The following operators joined MAPS for the 2024 or 2025 season and haven't been formally introduced through MAPS Chat. Most have begun operations at new stations but others have joined established operators or inherited the station from previous operators. We welcome them all to the MAPS family.

Stephanie Bilodeau Alamo, TX
Rebecca Boazman Eastover, SC
Carrie Deegan Webster, NH
Tully Frain Salt Lake City, UT
Gwendolyn Gibbons Peterborough, NH
Meredith Heather Columbia, SC
James Holt Mohnton, PA
Ashley Jensen, MSc Picton, ON
Rodd Kelsey Sacramento, CA
Nick Liadis Pittsburgh, PA
Katharina Livar Knoxville, TN
Mercedes Maddox Prattville, AL
Logan McCord Prattville, AL
Nicholas Smith Knoxville, TN
Sara Sweet Sacramento, CA
Alexandre Terrigeol Grandes-Bergeronnes, QC
Ryan Terrill, Ph.D Ashland, OR
Dan Wenny Peterborough, NH
Crystal Willett San Bernardino, CA
David Yeany II Pittsburgh, PA



Photo by Mick Thompson

IBP Banding Classes

Wolf Ridge Environmental Learning Center in NE Minnesota is hosting banding classes again in 2025. The beginner class will be held June 19 – 26, 2025, and the advanced class June 29 – July 3, 2025. A youth ornithology camp will also be available for students (entering grades 10-12). The Ornithology Field Camp will be held July 6-11, 2025. Visit Wolf Ridge's events page for information on all of these classes.

If you have your own group or would like to host a class, we welcome you to contact us to schedule one. If you want to be notified when registration opens for new classes, please email Danielle Kaschube (dkaschube@birdpop.org) to be put on the training class email list. If you are on this list, you will only get emails regarding scheduled classes.



Danielle Kaschube instructs a student bander in 2021.

We hope you have a
fabulous 2025 MAPS
season!

Photo by Tony Sprezzatura