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MAPS Chat

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

Number 15 – April 2015



Red-breasted Sapsucker, unknown



Cedar Waxwing, Adrian Wolf



Red-shafted Flicker, Joe Kahl

Molt and Feather Wear

Danielle Kaschube, MAPS Coordinator

I'm sure that as a bird bander you have spent many hours poring over the minutia of which feather molts in which tract for which species in reference materials, such as the Pyle guide, trying to figure out how birds molt. Me too! For this article, though, I want to back away from specific details and think about some generalities in the wing feathers we use for ageing to help speed up the ageing process.

When I examine a bird I have preconceptions about where to look for molt limits. This saves a lot of time in ageing, so birds can be released sooner. For exam-



Wilson's Warbler F

Sun exposure is a factor that we often don't think about, but the UV-radiation really breaks down feathers. This photo displays the "sun shadows" sometimes seen on feather tips. The exposed tip is much more faded and worn than the portion of the feather covered by the adjacent feathers when the wing is closed. (Note: s1, p1-p2, p4-p5 have been replaced in this wing and show no wear.)

ple, for thrushes and mimids I look first at the greater coverts; in warblers I look at the primary coverts and tails. I can make these generalizations because I know some of the reasons why feathers are retained or replaced in the preformative and prealternate molts.

Feathers have many functions (flight, insulation, sexual signaling) and need to be maintained in good condition, but replacing feathers is an expensive process - both materially and energetically. Processes that can break down feathers include mites, abrasion, flight pressures, and primarily sun exposure. Evolution has had to balance wearing factors and the cost of feather replacement.

Below I list the main wing feather tracts along with some generalizations about how the tract molts in passerines and how wear affects their molt.

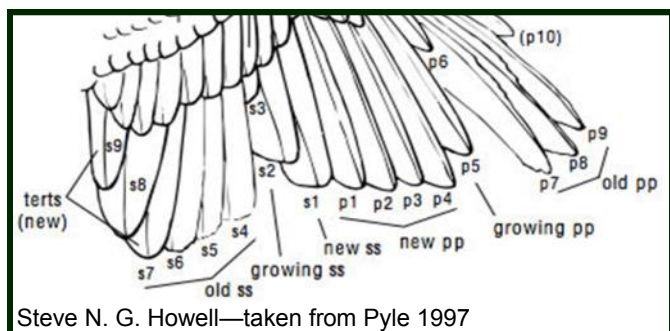
Primaries - The primaries are the largest feathers on the wing, and are the "thrusters" which lift the bird off the ground and provide forward movement during flight. The feathers are stiff and asymmetrical with the leading vane being narrower than the trailing vane. The primaries are replaced only a few at a time, proximally to distally (see diagram below). Passerines need

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to fly to survive in the wild and if any of these large feathers are missing, then the airfoil is compromised and significantly more energy is required for flying. These large feathers require a lot of material resources to create and so most passerines only replace these once a year. A few species are exceptions to this rule, having primaries molted during both the preformative and prebasic molts. These include White-eyed Vireo, some Common Yellowthroats, and Indigo Bunting, which molt just outer primaries, and some Northern Cardinals, which molt just inner primaries. Molt limits in the primaries make ageing much easier so bookmark in your head which species you band that can follow these patterns.



Steve N. G. Howell—taken from Pyle 1997

Secondaries - The outer secondaries (s1 to s6 in passerines) are the next largest feathers on the wing and create the main airfoil for lift. These feathers are blunt tipped and stiff, though softer and more symmetrical than the primaries. They generally are also only replaced once a year and only a few at a time (distally to proximally) for the same reasons as the primaries. Molt limits in the secondaries are often harder to see than in the primaries, but don't skip this tract, as it can also hold valuable ageing clues.

Tertials - The tertials, while technically still part of the secondary tract (s7 to s9), are much softer compared with the primaries and outer secondaries and are nearly symmetrical. They are more like body feathers in shape (symmetrical) and that they are inserted into the skin rather than the bone of the humerus like the remaining secondaries.

These feathers are protective and take the brunt of the sun damage done to the wings, i.e. they cover the primaries and secondaries in the folded wing. Because they are not critical to the integrity of the airfoil, these feathers are more likely to be replaced during preformative and prealternate molts, compared to the primaries and outer secondaries. Compared to the ridged molting pattern of the primaries and secondaries, there is also considerable variability in the order in which they molt. There is some variability in the order in which the tertials molt. Most often it is the central of these three feathers (s8) that molts first, though the

innermost (s9) can sometimes precede the central tertial. The molt limits here are usually quite visible, but many banders don't think to look.

Primary Coverts - The primary coverts are small, stiff feathers that prevent air from slipping between the shafts of the primaries and hence increase flight efficiency. Because they are stiff and relatively protected from the sun, they get very little wear and are generally molted only in prebasic molts with their primaries. There are species that are exceptions (think the species that molt primaries) and this tract is particularly helpful when ageing woodpeckers because they can retain these feathers in specific patterns during the second and later prebasic molts.

Greater Coverts - The greater coverts are soft, symmetrical feathers directly above the secondaries. They are soft and very exposed on the wing, so experience a lot of wear and need frequent replacement - though the entire tract is not always replaced.

Expect that if only part of the tract is molted it will be the innermost feathers (the most exposed) that are replaced. This tract is different from the previously mentioned tracts because the feathers often molt nearly all at once. If only a few feathers are going to molt they will all do so at the same time. This creates the very helpful molt limits I mentioned at the beginning of the article for thrushes and mimids.



Median and Lesser Coverts - The median and lesser coverts are above the greater coverts and are more similar to contour (body) feathers than the other feathers on the wing. They are molted during most molts and in a much less regular pattern than the other feathers mentioned previously and generally from inside to outside and from upper to lower covert rows.

In summary, think about the balance of expense of feather replacement and need of replacement due to feather wear. Then, try to make generalizations about where useful molt limits are located by species group. Lastly, remember your commonly captured species that are the exceptions to the rules. I hope these hints will help speed up the processing of your next bird in hand! ●

Welcome to Steve Albert



We want to extend a warm welcome to Steve Albert, our new Assistant Director for Cooperative Demographic Bird Banding Programs.

Steve joined IBP in September 2014 and over the next two years he will be working to expand and promote the

MAPS Program, and its sister program in Latin America, MoSI. For several years, Steve has been involved with the study and conservation of the federally endangered Southwestern Willow Flycatcher, assisting research on the species' wintering grounds in Latin America. His other research interests include ecological restoration, and developing strategies for diverse partners to work on cooperative conservation projects.

Why Band Birds?

Steve Albert, Assistant Director for Cooperative Demographic Bird Banding Programs

About a month ago, I had the opportunity to speak to Point Reyes Station Lions Club, the local branch of the international civic and social group dedicated to charity and service. Point Reyes Station is a small town, and I wanted to get to know some of the other area businesses, and have them learn more about The Institute for Bird Populations.

I knew beforehand that most of the participants were from organizations having nothing to do with environment and might know very little about birds, or why researching and monitoring them was important. In getting ready to explain it to them, it got me thinking – Why **were** they important? For that matter, why were birds important?

The first thing that came to mind was (to use one of the ecological concepts *du jour*) the “ecosystem services” birds provide. Ecosystem services are the direct and indirect contributions of ecosystems to human well-being. Birds of course provide many important such as pollination of economically or ecologically important plants, dispersing seeds of many types of conifers, and controlling economically damaging pests such as rodents and insects. In addition, bird watching and related eco-tourism is of course a major economic force in many parts of the country (this is particularly true here in Point Reyes). If it

IBP has a new website!

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NEWS & RECENT PUBLICATIONS

ABOUT OUR WORK

The Institute for Bird Populations studies the abundance, vital rates, and ecology of bird populations to enable scientifically sound conservation of birds and their habitats.

We collaborate locally, nationally, and globally with individuals, government agencies, and NGOs in diverse fields to assess the effects of land management actions, climate change, and other ecological stressors on bird populations, and prescribe science-based solutions. We use cutting-edge science, and frequently publish results in peer-reviewed journals.

We are very proud to announce the release of the newly redesigned website for The Institute for Bird Populations! The website retains all of the content from the previous website, along with new content, but presented in a new format rich with photographs. We encourage to you come visit and explore. www.birdpop.org

seems odd to frame the importance of birds in strictly economic terms, ecosystem services can be expanded to include the less-quantifiable mental and spiritual well-being that birds provide us.

Birds are also excellent indicators of environmental health. Before “the canary in the coal mine” was a cliché, underground workers really did take canaries with them to provide early detection against carbon monoxide and other gases. In the natural world, because they are relatively abundant, easily observed, and have a rapid metabolism and high position on the food chain, birds can provide clues to otherwise difficult to detect processes. Declines in peregrine falcons and bald eagles provided important information about the dangers and spread of DDT and heavy metals. Today, changes in bird populations can tell us a great deal about the impacts of climate change, drought, weather, and habitat change in

Why Band Birds? - Continued on page 6

MAPS Operator Profile:

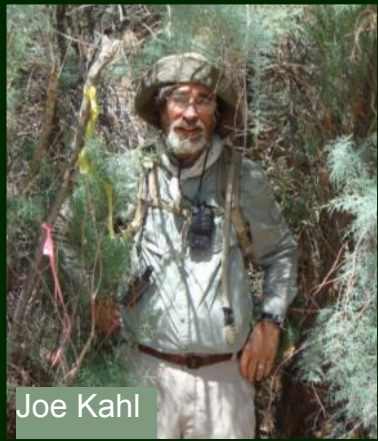
As MAPS operators, you spend numerous hours in the field collecting data, then entering and verifying it, before passing it on to us at IBP. Through short notes, phone calls and your data, we get to know you over the years but often you don't get to know one another. We wanted to devote some space and make some connections between all of you who are so important to us and the program. In this MAPS Chat we introduce a group working for the Bureau of Reclamation that use MAPS data to manage their lands.

Lower Colorado River Multi-Species Conservation Program

Joe Kahl, Biological Science Tech, U.S. Bureau of Reclamation, LCR MSCP, Boulder City, Nevada, US

The Lower Colorado River Multi-Species Conservation Program (LCR MSCP), established in 2005, is a 50 year, multiple partner program to create native habitat along the Lower Colorado River. Our office monitors those sites for use by the LCR MSCP covered species: Southwestern Willow Flycatcher,

Western Yellow-billed Cuckoo, Arizona Bell's Vireo, Sonoran Yellow Warbler, Summer Tanager, Vermillion Flycatcher, Gilded Flicker, Gila Woodpecker and Elf Owl. We also monitor Least Bittern, California Black Rail and Ridgway's Rail (Yuma Clapper Rail).

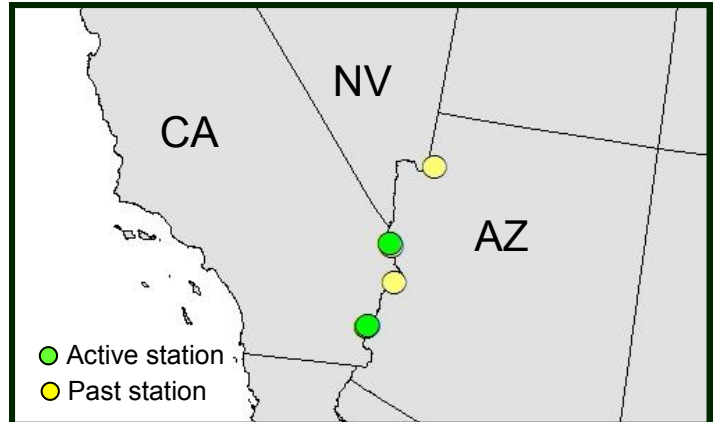


Joe Kahl



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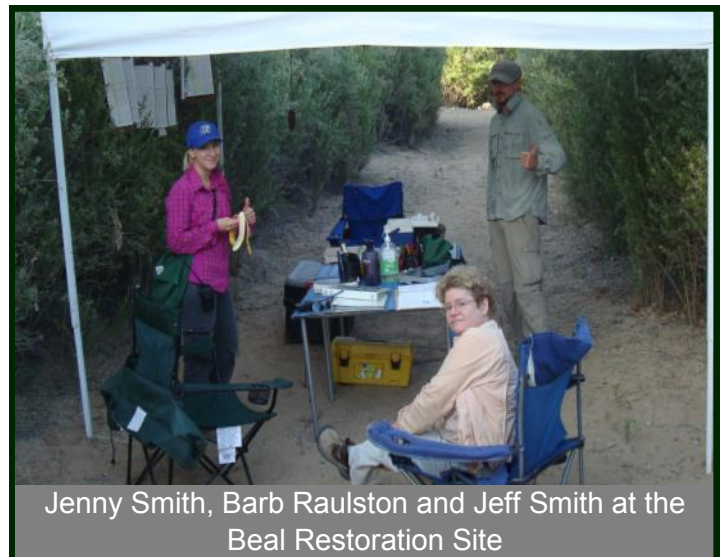
The LCR MSCP boundaries are the floodplain of the river from below Lee's Ferry in the Grand Canyon to the Southern International Boundary with Mexico. We use the MAPS Program to help us monitor bird use by covered species as well as resident and migratory species at our study sites. The study sites were mostly former farm fields that have been replanted with native vegetation such as cottonwood, mesquite and willow trees and associated shrubs and grasses. They are



irrigated and managed as to provide habitat for the covered species.

We currently operate three MAPS stations, one each at Cibola (2003) and Havasu (2009) National Wildlife Refuges and at Cibola Valley Conservation Area (2011). Our initial MAPS site was near Parker, AZ in 2000. Other sites that are no longer in use were at the upper portion of Lake Mead and another site on Havasu NWR. We also conducted fall and winter banding but no longer do so.

The overseeing of our MAPS Program is shared with wildlife biologist Chris Dodge. Both Chris and I received our initial training with Nicole Michel, formerly of IBP. Chris's was in 2001 at Audubon's Starr Ranch Sanctuary and mine in 1999 at the San Francisco State University field camp near Truckee, CA. We also have several of our biologists assisting that share the



Jenny Smith, Barb Raulston and Jeff Smith at the Beal Restoration Site



Second year molting Summer Tanager

four days on the road with us every banding period and most all of them have received their training from IBP instructors.

Our oldest recapture is a Blue Grosbeak that we banded in 2008 and recaptured in 2013, 6 years and 2 months later. He had also been recaptured in 2009 and 2011. We have also shown site fidelity through

recaptures for some of our covered species, Summer Tanager, Sonoran Yellow Warbler and Arizona Bell's Vireo which we also color-band to allow the re-sighting of these birds. The lower Colorado River corridor also is a place where migrants get sidetracked during their journeys. We have captured Eastern Phoebe, Hooded Warbler, Black-throated Green Warbler, Kentucky Warbler, Chestnut Sided Warbler, Worm Eating Warbler, Ovenbird, Painted Bunting and Baltimore Oriole; much to our surprise and enjoyment. Always nice to find somebody you least expect in your nets.

The LCR MSCP has programs specifically directed at the Southwestern Willow Flycatcher, Western Yellow-billed Cuckoo, Gilded Flicker and Elf Owl as well as a system-wide bird monitoring program. We also conduct surveys for the covered marsh birds at existing and created marsh habitats. We hope to continue to use the MAPS Program to help monitor our covered bird species along the lower Colorado River. ●

New in MAPSPROG

Thank you to the MAPS operators that took up the challenge and used beta test version of [MAPSPROG](#) for Windows 7 & 8. With your help we have been able to work out the kinks and the program is now available to all operators on the IBP website!

Because of requests from operators, and new for 2015, MAPSPROG will allow you to enter the banders' initials into the data line. This should allow operators to more easily track which banders banded which birds.

Join Your Bird Banding Association

The three bird banding associations listed below are member organizations who support banders and the science behind bird banding. These organizations bring together banders of every age and experience level, allow banders to share the latest techniques, provide information about current projects, allow banders to develop new partnerships, and more. Click below, and join the banding community.

[Western Bird Banding Association](#)

[Inland Bird Banding Association](#)

[Eastern Bird Banding Association](#)

New MAPS Operators Join the Flock — Welcome!

The following operators joined the MAPS Program during 2014 or early in 2015. 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 a while. We look forward to including them as part of the MAPS banding

Mary Beth Benton Sunbury, OH • **Rinchen Boardman** Thunder Bay, ON • **Mark Bowman** Newton, IA • **Rob Bradley** Cedar Rapids, IA • **Dawn K. Carrie** Huntsville, TX • **Neil R. Carrie** Huntsville, TX • **James K. Dame** Murfreesboro, NC • **Jackson Evans** Lake Junaluska, NC • **Diane Gohde** University Park, IL • **Matthew Hortman** Wewahitchka, FL • **Glen Johnson** Shoreline, WA • **Vernon Kleen** Springfield, IL • **Jeanette Kelly** Fall Creek, WI • **Brian Labuhn** Sunbury, OH • **Duck**

Locascio Baton Rouge, LA • **Hallie B Mahowald** Los Alamos, NM • **Heather McGuire** Murfreesboro, NC • **James Mordacq** Springfield, IL • **Daniel O'Malley** Baton Rouge, LA • **Dawn O'Neal** Rensselaerville, NY • **Catherine Ricketts** Wewahitchka, FL • **Margaret Rohde** Ambler, PA • **Anthony Rothering** Auburn, IL • **Cynthia Routledge** Clarksville, TN • **Lynn E. Wickersham** Durango, CO • **Stefan Woltmann** Clarksville, TN • **John Yunger** University Park, IL

North America and the tropics.

The approach of the MAPS Program has always been to use demographic monitoring to explore what factors or life cycle stages limit bird populations. Limiting factors are important because, without them, it can be difficult to determine what's really driving a population. In essence, the MAPS Program (and its sister program in the northern Neotropics which monitors overwinter survival and goes by the acronym MoSI) seeks to gain insight into the "What, When, Where, and Why" of species decline, so that conservation efforts can be directed at the times and places in the annual cycle when it will do the most good.

Is a population limited by factors on the breeding grounds or non-breeding grounds? By low reproduction or low survival? It's often demographic monitoring like the MAPS Program that can best answer these questions.

One last concept: Vital Rates. The "P" and the "S" in MAPS refer of course to Productivity (how many young are produced) and Survivorship (the probability of a bird surviving from one year to the next) which, along with recruitment (how many young survive and are pulled into the population as breeding adults), are called **vital rates**. These three parameters are the pillars of avian demographic research, and provide the metrics we need to understand where and when populations are in trouble. MAPS operators measure de-

mographic factors (age, sex, reproductive status, and population structure) so that we can estimate or model these **vital rates**.

The ecologists Sherry and Holmes wrote that "Any effort to increase... habitat in the less limiting season... will have relatively little effect on population size in the most limiting season." In other words, it won't do any good to improve habitat at a breeding site, if a population is limited by factors on the wintering grounds (and, of course, vice versa). I would add to that: "Any effort to improve vital rate function in the less limiting life stage will have relatively little effect on population size in the most limiting life stage." In other words, it won't do any good to improve reproduction, if the population is declining from poor survivorship.

That's the essence of MAPS. That's why we do what we do.

This was all very well-received by the Lions Club. I had a great dinner and I got to meet some of our neighbors here in Point Reyes Station. And in preparing the talk, I clarified in my own mind why all you MAPS operators are so important. Thank you! •

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IBP Bird Banding Classes

Each year IBP teaches several bander training classes for both beginning and advanced banders. There are three courses currently scheduled for 2015.

Summer 2015

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 15-19, 2015 and the beginner class will be held June 21-28, 2015. 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.

A beginner banding class will be held on Hurricane Island off the shore of Maine from July 5-11, 2015. More information on this



class will be posted on our [bander training page](#) as it becomes available.

Fall 2015

A beginner banding class will be held at the [Opossum Creek Retreat/New River Birding and Nature Center](#) in south central West Virginia, just minutes from the New River Gorge National River. The class will be held this fall with the dates to be announced soon. Please contact the class host, Keith Richardson, (phone: 888-488-4836) to register, or check out the [class information page](#) for more information about the classes, including how to register.

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