The INSTITUTE for BIRD POPULATIONS

2016 Annual Report

The INSTITUTE for BIRD POPULATIONS
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IBP Staff – Seated, left to right: Joanna Wu, Bob Wilkerson, Mandy Holmgren, Ruth Lopez, Peter Pyle, Lynn Schofield, Helen Loffland. Standing, left to right: Steven Albert, Ron Taylor, Jerry Cole, Deborah Mills, Morgan Tingley, Chris Ray, Jim Saracco, Danielle Kaschube, Lauren Helton, David DeSante, Rodney Siegel.

A Message from IBP's Executive Director:
In mid-October, IBP's year-round staff gathered in Marshall, California for our annual staff retreat to assess our successes and challenges during the past year, and chart our course into the future. About half of our staff telecommutes, in some cases from other states, and the retreat is our once-a-year opportunity to meet in person. It was a great pleasure to reconnect with colleagues and old friends, and also to share an overview of IBP's current projects. Reflecting recent growth in IBP's programs, this year was the largest such gathering in IBP's history, with 18 participants.

But growth for growth's sake has never been a goal at IBP. Rather, we gauge our success by our productivity and our positive impact on bird conservation. In 2016, IBP scientists had another highly productive year, publishing nearly 20 peer-reviewed works (with several more in press or in review; see page 14). Our innovative science contributes to a better understanding of avian ecology and, in many cases, directly informs and improves habitat management and species conservation. Key to ensuring that our science gets translated into conservation-oriented actions and policies are the numerous partnerships we cultivate with state and federal agencies, private industry, and other researchers and conservation organizations (see page 16). These partnerships greatly increase the quantity, quality, and impact of the work we accomplish.

In the pages that follow, we describe some of our activities during 2016. If you agree that IBP is making a difference for bird conservation, I hope you will consider finding a way to partner with us – by collaborating, by volunteering, or by donating funds to sustain our work.

With much gratitude for your support,

Rodney Siegel, Ph.D., Executive Director

On the Cover: Spotted Towhee Photo: Rick Leche

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.

IN THIS REPORT

This page:
Ruby-crowned Kinglet
Photo: Kelly Colgan Azar

The MAPS & MoSI Programs

What causes declines in bird populations? The Monitoring Avian Productivity and Survivorship (MAPS) and Monitoring Overwinter Survival (MoSI) Programs were designed to help answer this question. Relying on a network of more than 1,400 past and current bird banding and monitoring stations (nearly 400 of which are currently active), IBP and our many collaborators use this data to estimate and monitor avian vital rates, such as productivity and survival, across the species' full annual life cycle.

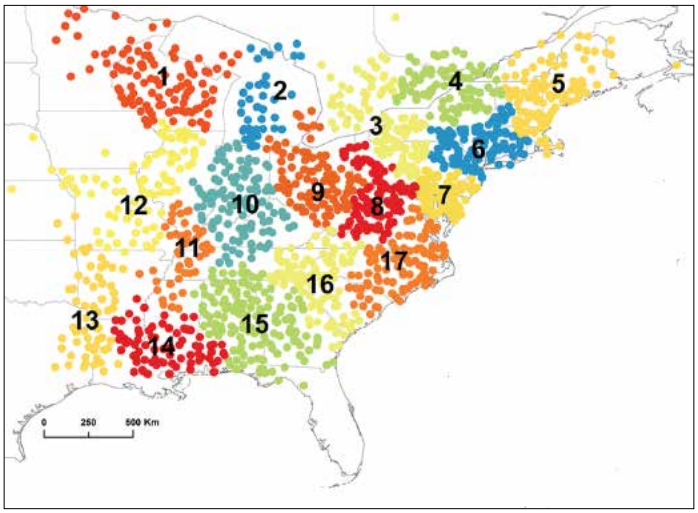
Wilson's Warbler
Photo: Mick Thompson

MAPS Data Offer Insights into Avian Ecology at Many Spatial Scales

One of the strengths of the MAPS Program is its capacity to yield inferences about bird populations at multiple spatial scales, from continental to local. Two recent studies – one other using continent-wide MAPS data to re-think what a bird population is, and the other testing the effects of noise at a single MAPS station in New Mexico – illustrate this continuum.

What Constitutes a Bird "Population"?

How we delineate the boundaries of bird populations is important because different populations face different pressures, and distinguishing meaningful populations can yield more effective conservation measures. Yet, the term 'population' is troublingly imprecise, especially for birds, which often migrate great distances. Most populations have traditionally been delineated along geographic boundaries – for example in different bio-regions, mountain ranges, or watersheds, which may or may not correspond to the pressures populations face or, perhaps more importantly, to the demographic patterns they share. In a paper published in *Journal of Applied Ecology*, IBP scientist Jim Saracco joined colleagues at Smithsonian Migratory Bird Center to develop an approach for delineating populations of eight passerine species using data collected as part of the North American Breeding Bird Survey. The researchers then used demographic parameters derived from MAPS data to independently validate their promising new method. The study will likely inform regional population objectives for conservation planning.



Left: Breeding ranges of 17 populations of Wood Thrush, identified by clustering Breeding Bird Survey routes based on trend, abundance, and spatial proximity, and corroborated using MAPS data (Figure courtesy of Journal of Applied Ecology).

Above: MAPS data revealed populations of White-breasted Nuthatch and other species at Los Alamos National Laboratory were uneffected by noise from high explosives. Photo: Tibor Nagy

Bird Response to Noise Disturbance

The effects of noise on birds is a growing field of study. In a paper published in *Journal of Environmental Protection*, scientists from the Los Alamos National Laboratory and IBP's MAPS Coordinator, Danielle Kaschube, examined avian abundance, survival, and productivity in response to periodic noise from Lab operations involving high explosives.

The analysis used 18 years of data from a MAPS station operated by the Lab to show that detonations have not had a measurable effect on local bird populations. In the right context, multi-year MAPS data, from even a single station, can be useful for informing local-scale land management decisions.

An Interview with Dr. David DeSante

Founder of IBP and the MAPS and MoSI Programs

Twenty-eight years after founding IBP, David DeSante fully retired this year. Dave will continue to serve as President on IBP's Board, but looks forward to spending less time at IBP and more time with grandkids and birding in the coming year.

How did you first become interested in birds?
I can't remember not being crazy about birds. My parents told me my first words were, "Pissh – pssh – pssh," but that's probably not true! One day when I was 5 or 6 I flushed a bird that had flashing golden wings and I ran in the house to tell my dad I saw a Baltimore Oriole, which I knew was his favorite bird, and he said "Naw, that was a Flicker – a woodpecker. See those white and black woodpeckers with the bright red heads?" I said, "What woodpeckers?" – and thus we discovered that I needed glasses. Did I see lots of new birds after that!

You've had a varied career in science and academia. What were you doing before you founded IBP?

I went to the Case Institute of Technology and chose the easiest major, Metallurgical Engineering, hoping just to be able to graduate. I did, and then chose a draft-deferred job in the aerospace industry in Southern California.

Knowing that I was leaving behind spring warbler migration in Ohio was hard, but I soon found out that a couple of guys in California, Guy McCaskie and Rich Stallcup, were finding all manner of eastern warblers in coastal California. Eventually, a series of flukes took me to Stanford and a Ph.D. in Biology with a dissertation on "Mirror-image misorientation in warblers." This led to teaching positions at Stanford and Reed College.

But an opportunity to set up a long-term research program on a Sierra subalpine bird community in 1977 rekindled my love for research in natural environments. In 1978, I left Reed for the Point Reyes Bird Observatory (now Point Blue), standardized their banding program, and established another long-term study of a natural avian community using known-age, individually color-banded populations.

What has been your proudest achievement with the MAPS & MoSI Programs?

I don't know that I can single out one. I stressed to early biologists at IBP that the data we were collecting would allow future researchers to answer questions that we could not even ask yet, and this has been confirmed several times. It also became apparent early on that an overall improvement in the quality of data collected by the bird-banding community was necessary.

So, in addition to creating MAPS and MoSI, IBP became a primary creator of the North American Banding Council (NABC), which has led to the training of thousands of bird banders. Virtually every time these banders band birds, some onlooker – a child, or maybe a parent – is moved to appreciate and love the beauty and magic of our feathered brothers and sisters.

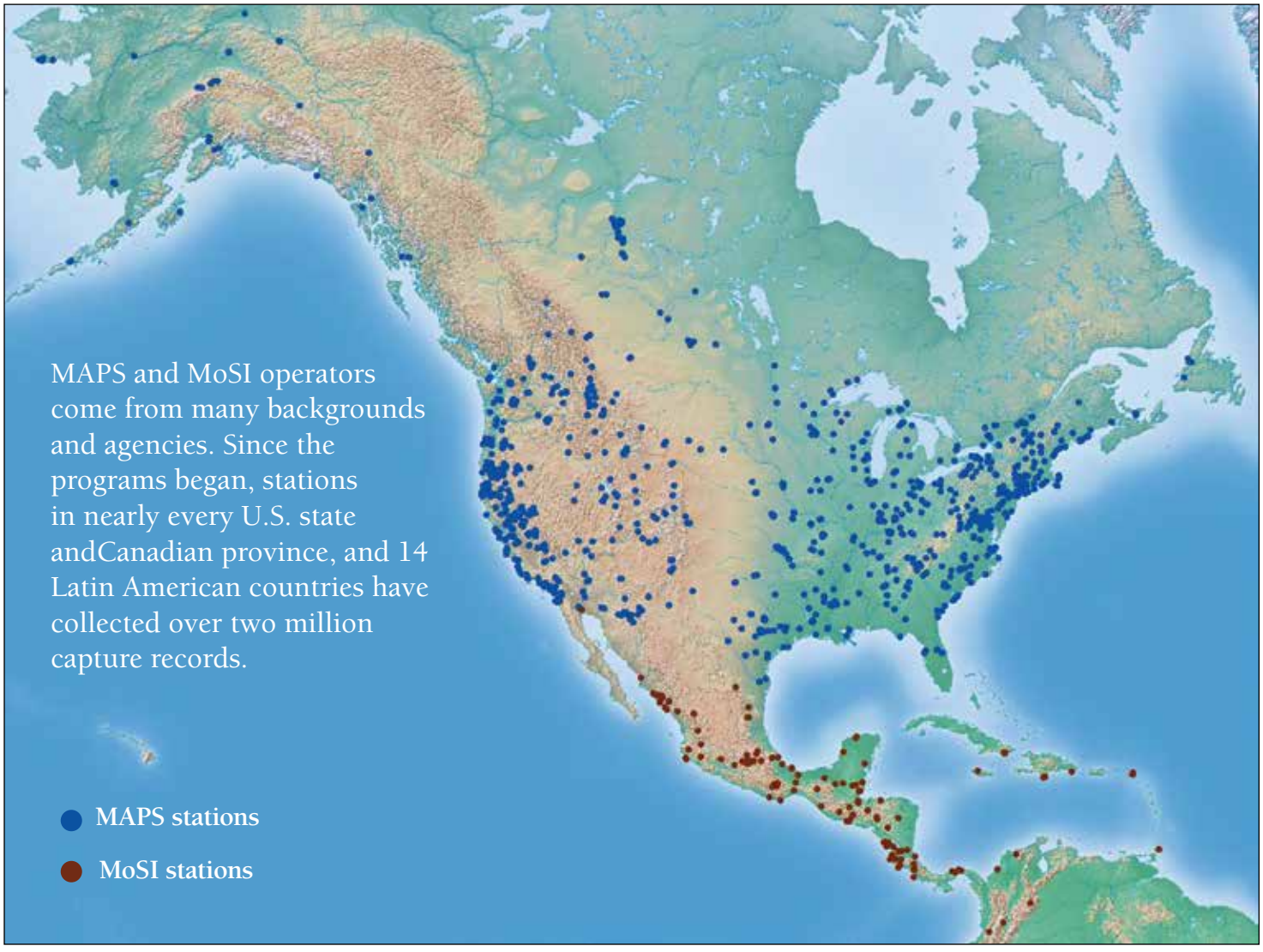
This may be the most important conservation work any of us can do.

MoSI Data Show Complex Winter Movements of Migratory Songbirds

For centuries, long-distance bird migration was one of Earth's great mysteries. Using new technology and innovative analytical methods, scientists are gradually learning more about it – and it appears to be more complex than previously thought. In a paper published this year in *Journal of Applied Ecology*, IBP Research Associate Viviana Ruiz-Gutierrez, IBP Scientist Jim Saracco, and colleagues make inferences about within-season movements of migratory songbirds on their tropical wintering grounds by applying new modeling techniques to mark-recapture data gathered at MoSI stations.

Results indicate that many individuals moved into and out of the study areas through the winter, challenging the widely held notion that birds are relatively sedentary between their long migratory movements.

Winter movements in songbirds (including for Prothonotary Warbler, above) appear to be more complex than previously appreciated and suggest a need to consider networks of non-breeding habitats for conservation. Photo: Laura Gooch



IBP's Sierra Nevada Bird Observatory

IBP's Sierra Nevada Bird Observatory studies and works to conserve populations of birds and other wildlife in California's Sierra Nevada mountains. We collaborate with state and federal agencies, private industry, and other NGOs to conduct innovative science that advances our understanding of Sierra Nevada ecology and yields practical solutions to conservation challenges.

Photo: Scott McGuire

FITZ-bew! Willow Flycatcher Conservation and Restoration

IBP is working in numerous ways to conserve populations of Willow Flycatcher, a California Endangered Species, throughout the Sierra Nevada and southern Cascades. The birds depend on montane meadows with healthy stands of willow and abundant surface water that persists well into summer.

Willow Flycatcher
Photo: Lynn Schofield

After noticing that many recently restored meadows, which appeared to contain adequate habitat, did not yet have nesting Willow Flycatchers, in 2016 we initiated an experiment to facilitate re-colonization. Willow Flycatchers are "semi-colonial," often nesting in concentrations of many closely-spaced territories, and we wanted to test if the presence of other individuals provided a cue about habitat quality. At selected sites, we set up automated broadcast units that played the distinctive Willow Flycatcher "fitz-bew" vocalizations.

Preliminary indications are that the technique can work – we were excited to see two of seven experimental sites re-colonized by the species this year, compared to zero of seven control sites, where no automated calls were used.

In the winter of 2016-2017, we are also initiating a partnership with California Department of Fish and Wildlife to develop a comprehensive state-wide conservation strategy for Willow Flycatcher.

New Conservation Strategy for Great Gray Owls

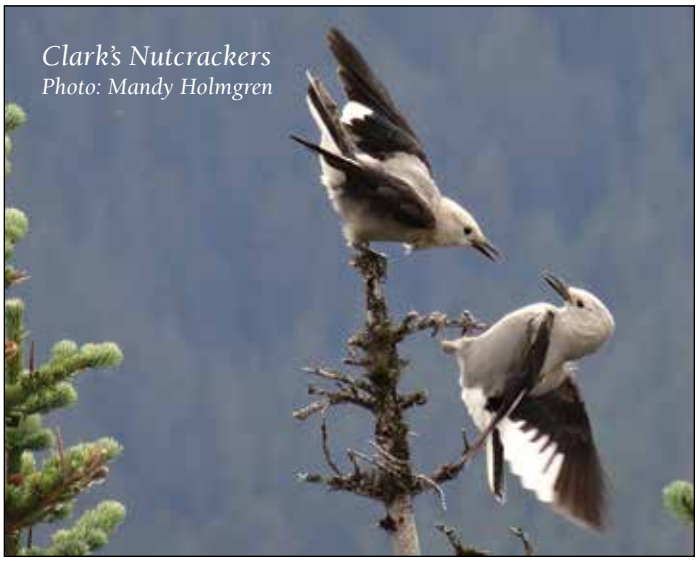
IBP recently partnered with the California Department of Fish and Wildlife and others to develop a conservation strategy for Great Gray Owls in California. The Strategy collates information from the scientific literature and interviews with 23 experts. It provides over 50 conservation recommendations that we believe offer the best chance of preventing extirpation of this species in California and increasing the population. The plan is available on our website.

Great Gray Owls Nesting in Low-Elevation Forests

Fewer than 100 pairs of Great Gray Owls likely nest in California. IBP collaborates with many partners to study and conserve this California-endangered species. One focus of this work in 2016 was assessing the importance of lower-montane forest. Great Gray Owls in the Sierra Nevada were once believed to nest strictly within mid-elevation conifer forests around the edges of montane meadows. However, our recent paper in *The Journal of Raptor Research* documented this species nesting at atypical lower-elevation sites - on commercial timberlands, generally far from wet meadows.

Based on these findings, we modeled potential nesting habitat throughout the lower-montane zone of the Sierra Nevada, and identified areas in ten counties that we recommend be surveyed. Identifying such locations could help determine if this cryptic species is nesting in previously unidentified areas, perhaps in numbers that may be a significant component of the very small California population.

Great Gray Owl
Photo: Tambako



Clark's Nutcrackers
Photo: Mandy Holmgren

Effects of Climate on Bird Populations in Western National Parks

As part of a long-term collaboration with the National Park Service, IBP monitors bird populations in nine western national parks via nearly 2,000 point counts each year. Because populations in montane wilderness areas of national parks are relatively unaffected by habitat alteration, monitoring there is especially useful for revealing effects of climate and other ecosystem change.

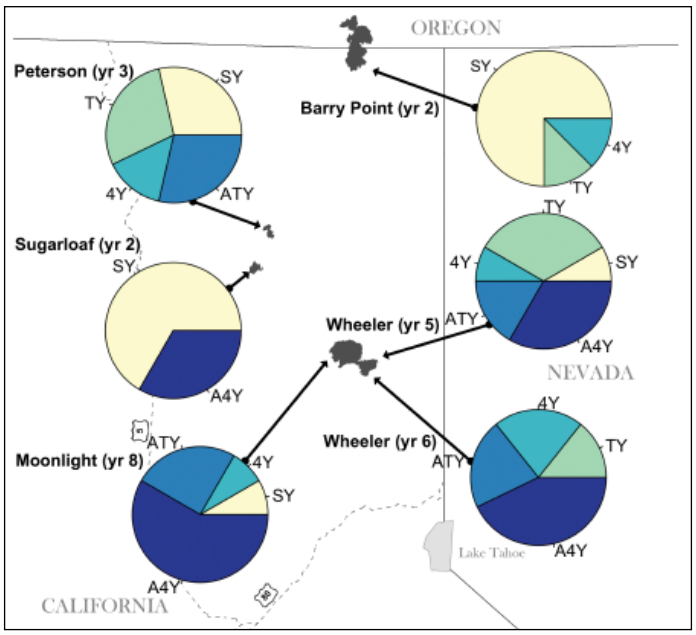
In a paper currently in review for publication, IBP scientists and colleagues at the National Park Service and U.S. Geological Survey report population trends of birds at Mount Rainier, North Cascades, and Olympic National Parks between 2005 and 2014. Most species had stable or increasing densities, perhaps as a result of reduced snowfall that opened up high-elevation habitat earlier in the season. One notable exception to this generally good news was Clark's Nutcracker, which is showing worrisome declines. More generally, the analysis provides a model for integrating recent advances in modeling population trends based on point count data, and for assessing the role of climate in driving those trends.

Ecology and Management of Burned Forests in the Sierra Nevada

Birds and other wildlife in burned forests are a major focus of IBP's Sierra Nevada Bird Observatory. Here we describe several of our projects aimed at understanding the ecology of burned landscapes.

Black-backed Woodpecker Conservation

Few vertebrate species are more closely tied to burned forests than the Black-backed Woodpecker, which colonizes them in high densities to feed on abundant wood-boring beetle larvae. Ensuring adequate habitat for the woodpeckers on public lands has become a flashpoint in California, where burned forests are often harvested for economic benefit, to facilitate re-planting, or to reduce fuels. We work closely with the U.S. Forest Service to produce Black-backed Woodpecker research that is useful to land managers and decision-makers within the agency. In 2016 our Black-backed Woodpecker studies yielded peer reviewed publications in *Methods in Ecology and Evolution, Remote Sensing of Environment*, and *The Auk: Ornithological Advances*. The papers describe models for predicting Black-backed-Woodpecker distribution and abundance after fire and evaluating the population-level impacts of specific harvest plans, as well as advances in understanding how new burned areas are colonized (see figure below, left).



Above: Locations of 5 fire areas where adult Black-backed Woodpeckers were sampled after fires. Charts show the proportion of birds in age classes 2nd year (SY), 3rd (TY), 4th year (4Y), after 3rd year (ATY), or after 4th (A4Y). Results indicated that new fires are colonized primarily by young birds that have not previously bred elsewhere, and birds that establish breeding territories tend to remain at the same fire for the duration of their lives. Figure courtesy of The Auk: Ornithological Advances.

'Pyrodiversity' Promotes Biodiversity

How does biodiversity respond to forest fire? Ecological theory predicts that the high diversity of habitats and successional states created by some fires – termed pyrodiversity – should cause an increase in the number of species living in an area. But how long after fire does this diversity boost appear, and how does it change through time?

As part of a partnership with the U.S. Forest Service, we surveyed birds at nearly 100 fires in California's mountains over the 10 years after they burned. In a paper published in *Proceedings of the Royal Society B*, we report that pyrodiversity increases bird diversity, and the relationship strengthens throughout the decade following fire.

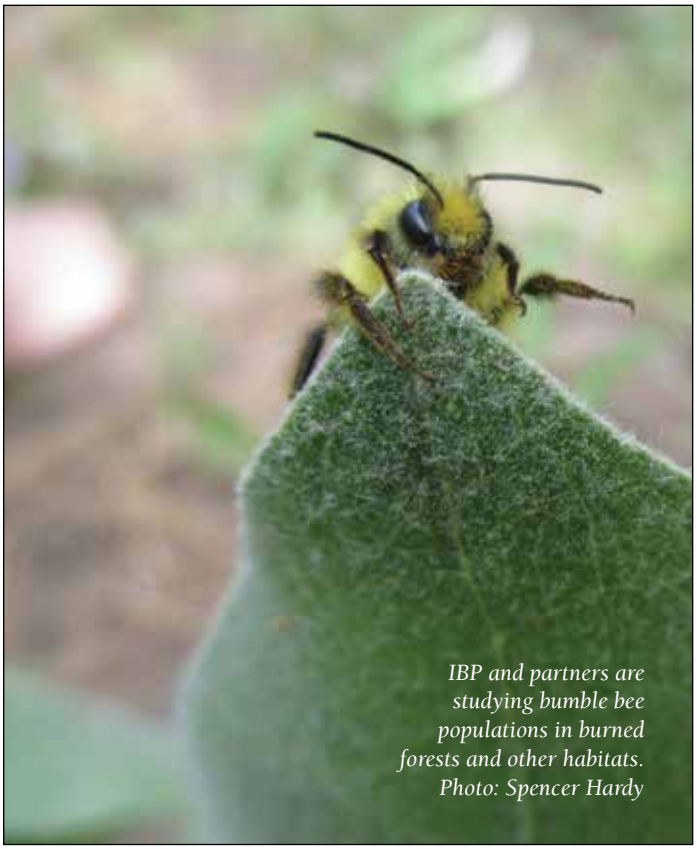
Promoting pyrodiversity as a forest management goal in western forests may become more important: climate change and a historical legacy of fire suppression may be yielding increasingly homogenous post-fire landscapes with reduced avian diversity.

Managing Burned Landscapes to Help Bumble Bees

In response to troubling declines in native bees and other pollinators, federal land managers have been tasked with helping pollinators, but often have little information to guide their actions. IBP recently partnered with scientists at San Francisco State University and the U.S. Forest Service to develop a capture-release survey protocol for bumble bees, which we are now implementing to study bumble bee abundance, diversity, and habitat needs.

Since 2015, IBP crews have caught, identified, and released over 3,000 bumble bees of 16 species in or near three large burned areas.

Our first paper stemming from this work, currently in review, assesses bee use of post-fire chaparral – which we show is important habitat for bumble bees. The project was designed at the request of the Forest Service to inform post-fire forest restoration.



IBP and partners are studying bumble bee populations in burned forests and other habitats. Photo: Spencer Hardy

View from the Field

Johanna Rivera
Beetle Survey Crew Leader

Hiking over fallen trees through burned landscapes, I have come to realize that I must think like a deer to get through these steep, shrub-choked landscapes. Results from our project will help describe wood-boring beetle diversity and abundance. Beetles play an important ecological role in tree decomposition and are the main food source for Black-backed Woodpeckers.

Later in the season I'm chiseling bark off dead trees. Now I must think like a woodpecker to see if there are any wood-borer larvae to collect. This is my favorite part -- I get to see the mysteries under the bark - the distinctive frass galleries that beetle larvae have created by chewing through the wood to feed, and eventually emerge and fly away.

IBP Seasonal Biologist Johanna Rivera shows off her soot-stained hands – sampling beetles in burned forest can be really dirty work! (Beetle art: Cypriacis aurulenta by Lauren Helton.)

I also have emerged into a vast field of biology. The experience I've gained through IBP as a volunteer and crew leader has been physically and mentally challenging, and has opened many doors for pursuits in my wildlife conservation career, and graduate studies. I'm excited to share the skills and knowledge that I have acquired in the field with the next scientific project I assist.

Rufous Fantail, one of the native birds of Saipan. (Artwork: Lauren Helton)

The Pacific Islands Program

Studying Bird Populations in the Northern Mariana Islands and American Samoa

Understanding Links Between Weather, Vegetation, and Island Bird Populations

With restricted geographic ranges and small populations, island bird species are often more vulnerable than their mainland counterparts to disease, habitat alteration, and effects from introduced species. IBP is working with the governments of the Commonwealth of the Northern Mariana Islands and American Samoa to study the population dynamics and ecology of landbirds on tropical Pacific islands.

Bridled White-eye (Artwork: Lauren Helton)

In a paper published this year in the scientific journal *PLoS ONE*, IBP scientists and colleagues explored several factors that affect populations of native birds on the island of Saipan. The study revealed that for 3 native species – Rufous Fantail, Bridled White-eye, and Golden White-eye – seasonal rainfall was positively correlated to vegetation condition at all but the highest rainfall levels, and that temporal variation in vegetation condition affected the productivity of each species differently.

Understanding the linkages between weather, variation, and bird populations is critical as the seasonal timing, extent, and variability of rainfall is expected to shift in the coming decades as a result of climate change.

In related work, in 2016 we continued to monitor and assess effects of Typhoon Soudelor, which struck Saipan in 2015 and was the strongest storm to hit the Northern Marianas Islands in nearly 50 years. The typhoon flattened trees and homes, and left widespread damage to Saipan's ecosystems. Our preliminary data suggest that bird populations in areas comprised of mostly native vegetation may have fared better during the storm and its aftermath than areas more heavily invaded by non-native vegetation.

Golden White-eye (Artwork: Lauren Helton)

2017 Sneak Preview: New Research on Little-Known Tongan Ground Dove

In 2017, IBP expects to partner with the Government of American Samoa to launch an ambitious study of the small population of Tongan Ground Doves that reside on Ofu and Olosega islands in American Samoa. This population was only discovered in 1976 and was listed as Endangered under the U.S. Endangered Species Act in September 2016. In November 2015, we established six demographic bird monitoring stations on Ofu-Olosega and captured and photographed 18 Tongan Ground Doves, obtaining initial information on molts, plumages, biometrics, and criteria to determine age-sex groups.

During anticipated work in 2017 we will expand the project to include occupancy surveys, DNA sampling, and radio tracking, with goals of estimating home-range population sizes, and collecting information on habitat preferences, diet, nesting behaviors, and other information that will inform conservation of this potentially imperiled bird population.

Adult female Tongan Ground Dove captured by IBP's crew in 2016. Photo: Bobby Wilcox

MOLT STUDIES: Tips for Identifying Juvenile Warblers

Accurately determining the age and sex of birds is essential for understanding their population dynamics, and IBP is among the leaders in North America in this field of study. Among passerines, birds in juvenile plumage can be challenging to identify; sometimes the best method is to try to locate the parents. To add to the difficulty, wood warblers remain in juvenile plumage for a very short time – as little as a week or less after fledging. Some even begin their preformative molt before leaving the nest. Because birders rarely encounter these birds as juveniles, these early plumages are not well covered in field guides.To address this challenge, IBP scientist Peter Pyle joined with colleagues Chris Godwin and Ken Foster to publish an article in *Birding* on how to identify wood warblers in juvenile plumage. The tail pattern and color of the wing edging and soles of the feet are the most important clues. The article also includes a quiz for curious birders to test their knowledge (see the example at right).

Above: Can you identify this juvenile warbler? This species can retain juvenile plumage a bit longer than some of the other warblers. *(The answer is on page 15.)* *Photo: Boreal MAPS team*

Peer-Reviewed Publications

IBP scientists frequently publish findings from our conservation science in peer-reviewed journals. During 2015 and 2016, IBP staff published the works listed below, often in collaboration with colleagues from other institutions. A searchable database listing these and more than 600 other publications and technical reports by current and former IBP staff and partners is available at www.birdpop.org.

Ahrestani, F. S., J. F. Saracco, J. R. Sauer, K. Pardieck, and J. A. Royle. In revision. An integrated population model for bird monitoring in North America. *Ecological Applications.*

Albert, S.K., D.F. DeSante, D.R. Kaschube, and J.F. Saracco. 2016. MAPS (Monitoring Avian Productivity and Survivorship) data provide inferences on demographic drivers of population trends for 158 species of North American landbirds. *North American Bird Bander* 41:133-140.

Albert, S., D. DeSante, R. Siegel, D. Kaschube, and J. Saracco. 2016. Monitoring landbirds in national parks: understanding populations, migratory connectivity, and climate change. Pages 11-17 in: S. Weber, editor. Engagement, Education, and Expectations — The Future of Parks and Protected Areas: *Proceedings of the 2015 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites.* Hancock, Michigan: George Wright Society.

Casas, A., M. Garcia, R.B. Siegel, C. Ramirez, A. Koltunov, and S.L. Ustin. 2016. Burned forest characterization at single-tree level with Airborne Laser Scanning for wildlife habitat assessment. *Remote Sensing of Environment* 175:231-241.

Clark, W.S., and P. Pyle. 2015. A recommendation for standardized age-sex class plumage terminology for raptors. *The Journal of Raptor Research* 49:513-517.

DeSante, D.F., D.R. Kaschube, and J.F. Saracco. 2015. VitalRatesOfNorthAmericanLandbirds.org. The Institute for Bird Populations.

DeSante, D.F., D.R. Kaschube and J.F. Saracco. In review. Using MAPS data to estimate population change for landbird species in western North America.

Foley, J., S. Menzel, C. Portman, and R.L. Wilkerson. In review. A precipitous decline of western burrowing owls in Yolo County, northern California.

Foster, K.R., C.M. Godwin, P. Pyle, and J.F. Saracco. In press. Reclamation and habitat-disturbance effects on landbird abundance and productivity indices in the oil sands region of northeastern Alberta, Canada. *Restoration Ecology.*

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* 112:14290–14294.

Guallar, S.X., A. Ruiz-Sánchez, R. Rueda-Hernández, and P. Pyle. 2016. Molt strategies of ten Neotropical passerine species. *The Wilson Journal of Ornithology* 128:543-555.

Guallar, S.X., A. Ruiz-Sánchez, R. Rueda-Hernández, and P. Pyle. In review. Preformative molt in 23 resident Neotropical passerine species.

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. *Journal of Environmental Protection* 6:1442-1453.

Loffland, H.L., J.S. Polasik, M.W. Tingley, E. Elsey, C. Loffland, G. LeBuhn, and R.B. Siegel. In review. Bumble bee use of post-fire chaparral in the central Sierra Nevada.

Nordell, C.J., S. Haché, E.M. Bayne, P.M. Sólymos, K.R. Foster, C.M. Godwin, R. Krikun, P. Pyle, and K.A. Hobson. 2016. Within-site variation in feather stable hydrogen isotope (∂2Hf) values of boreal songbirds: implications for assignment to molt origin. *PLoS ONE* 11:e0163957.

Ortiz-Pulido, R., J.L. Alcántara-Carbajal, H. de la Cueva, J. Martínez-Gómez, P. Escalante Pliego, S.M. de la Parra-Martínez, T.P. Feria Arroyo y S. Albert. 2016. Conservación de aves en México: Una instantánea de 2015. Huitzil: *Revista Mexicana Ornitológico* 17:234-238.

Polasik, J.S., J.X. Wu, K. Roberts, and R.B. Siegel. 2016. Great Gray Owls nesting in atypical, low-elevation habitat in the Sierra Nevada, California. *The Journal of Raptor Research* 50:194-206.

Pyle, P., A. Engilis Jr., and D.A. Kelt. 2015. Manual for ageing and sexing landbirds of Bosque Fray Jorge National Park and north-central Chile, with notes on occurrence and breeding seasonality. Special Publications of the Louisiana State University. (Published in English and Spanish versions)

Eastern Bluebird
Photo: Evangelio Gonzalez

Pyle, P. 2016. Secondary aging criteria. *Birding* 48(2):28-32.

Pyle, P., C.M. Godwin, and K.R. Foster. 2015. Identifying juvenile warblers: The fun really begins here. *Birding* 47(6):58-69.

Pyle, P., R.J. Keiffer, J.L. Dunn, and N. Moores. 2015. The Mendocino shrike: Red-backed Shrike (*Lanius collurio*) x Turkestan Shrike (*L. phoenicuroides*) hybrid. *North American Birds* 69:4-35.

Pyle, P., and M. Reid. 2016. Molts and plumages in the Long-tailed and other jaegers: An "alternate" explanation for nonbreeding plumages? *Western Birds* 47:242–257.

Pyle, P., K. Tranquillo, K. Kayano, and N. Arcilla. 2016. Molt patterns, age criteria, and molt-breeding dynamics in American Samoan landbirds. *The Wilson Journal of Ornithology* 128:56–69.

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Answer to juvenile warbler quiz (Page 13):
Juvenile Yellow-rumped (in this case Myrtle) Warblers lack yellow in the rump and can be difficult to separate from juvenile Blackpoll and Bay-breasted warblers. In this case, the combination of wing-feather edging (gray in Yellow-rumped vs. green in Blackpoll and Bay-breasted) and soles of the feet (dull yellow in Yellow-rumped, bright yellow in Blackpoll, and grayish in Bay-breasted) can be used to separate juveniles of all three species.

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Partner Perspective

I first encountered IBP in the woods, rendezvousing with a Black-backed Woodpecker crew on Plumas National Forest in 2012. I was impressed with IBP's rigorous application of the scientific method while focusing on questions that directly inform conservation of birds and their habitats. The Plumas began collaborating with IBP shortly thereafter to study Black-backed Woodpeckers in relation to post-fire restoration.

Our collaboration with IBP has grown into a diverse array of projects that are informing post-fire restoration efforts across Plumas National Forest. In one project, IBP is evaluating bird communities in relation to riparian food web dynamics and stream function while helping the forest identify potential stream management options. In a related project, they are studying bumble bees in post-fire areas and grazing allotments to better inform pollinator management. IBP and the Plumas also are collaboratively studying California Spotted Owl and Northern Goshawk spatial ecology while measuring bird responses to restoration activities. Partnering with IBP has greatly increased the breadth and depth of knowledge and experience that is informing management on the Forest.

Matthew Johnson, Ph.D.
Program Manager, Plumas National Forest - Wildlife, Fish, Rare Plants and Invasive Species

IBP is grateful to our many partners for helping to make our work possible.

American Bird Conservancy
American Samoan Government
Audubon Canyon Ranch, CA
Audubon North Carolina
Avocet Research Associates, CA
Blackrock Nature Lodge, Belize
Burrowing Owl Preservation Society, CA
California Academy of Sciences
California Cooperative Ecosystem Studies Unit
California Department of Fish and Wildlife
California State Parks
California Partners in Flight
Calvin College, MI
Canadian Wildlife Service
Center for Spatial Technologies and Remote Sensing, UC Davis, CA
Colorado State University
Cornell Lab of Ornithology, NY
Dep. of Forest and Conservation Sciences, Univ. of British Colombia
Dep. Of Marine and Wildlife Resources, American Samoa
Devils Postpile National Monument, CA
Division of Fish and Wildlife, Commonwealth of the Northern Mariana Islands
Eldorado National Forest, CA
Environment Canada
Environment Now, CA
Farallon Marine Sanctuary Association, CA
First Solar
Gulf of the Farallones National Marine Sanctuary, CA
Hurricane Island Foundation, ME
Jeepney Projects Worldwide, CA
Kidd Biological, Inc., CA
Klamath Bird Observatory
Lewis and Clark National Historical Park, OR and WA
March Conservation Fund, CA
Mount Rainier National Park, WA
Museum of Vertebrate Zoology at Berkeley, CA
Museum of Wildlife and Fisheries Biology, UC Davis, CA
National Audubon Society
National Fish and Wildlife Foundation
National Park Service – North Coast and Cascades Network, WA and OR
National Park Service – Sierra Nevada Network, CA
North American Bird Conservation Initiative, Monitoring Working Group
North Cascades National Park, WA
North Carolina Museum of Natural Sciences
Opossum Creek Retreat, WV
Olympic National Park, WA
Owl Moon Environmental, Inc., Canada
Partners in Flight Western Working Group
Paso Pacifico, Nicaragua
Plumas National Forest, CA
Point Blue Conservation Science, CA
Reserva El Jaguar, Nicaragua
San Francisco State University, CA
San Juan Island National Historical Park, WA
Sequoia and Kings Canyon National Parks, CA
Sierra Foothills Audubon Society, CA
Sierra Pacific Industries, CA
Slate Creek Press, CA
Smithsonian Migratory Bird Center, Washington DC
Stanislaus National Forest, CA
The Nature Conservancy
Truckee River Watershed Council, CA
UCLA, Center for Tropical Research
UCLA, Dept. of Ecology & Evolutionary Biology
UConn, Dept. of Ecology and Evolutionary Biology
University of Belize
University of Georgia Costa Rica Campus
University of Nevada, Reno
Indiana University of Pennsylvania
US Army Fort Bragg, NC
USDA Forest Service Region 5
USDA Forest Service, Pacific Southwest Research Station
USDA Forest Service, Northern Research Station
USDI Bureau of Land Management, California Office
USGS Bird Banding Laboratory
USGS-FRESC, Corvallis Research Group, OR
USGS-FRESC, Olympic Field Station, WA
USGS Patuxent Wildlife Research Center, MD
USGS National Climate Change & Wildlife Science Center
Vertebrate Systems, LLC, MO
Western Bird Banding Association
Western Field Ornithologists
Wolf Ridge Environmental Learning Center, MN
Yosemite Conservancy, CA
Yosemite National Park, CA

IBP is also very grateful to independent contributors of MAPS and MoSI data (too numerous to list here!).