



THE INSTITUTE FOR  
BIRD POPULATIONS  
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# 2009 Annual Report



*Alan Monroy Ojeda*



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## **A message from IBP's Executive Director**

At **The Institute for Bird Populations** we are striving to produce quality science that helps resource managers and other environmental decision-makers better manage the bird populations under their stewardship. Bridging the gap between science and management—translating research results into clear, actionable guidelines for land managers to implement, test, and refine—has always been challenging, but the reality of climate change now makes it immensely more complex. Land managers must not

*“We shall never achieve harmony with land, any more than we shall achieve absolute justice or liberty for people. In these higher aspirations, the important thing is not to achieve but to strive.”*

Aldo Leopold

only determine how to best protect current resources, but also are increasingly being tasked with tailoring current management to benefit *future* resources under multiple climate change scenarios.

We are helping land managers meet these challenges by conducting innovative science—in conjunction with our long-running MAPS program (see page 5) and as part of our other research and conservation efforts—and by pursuing multiple means of disseminating our findings. During the last two years IBP scientists published (or submitted for review) 24 peer-reviewed papers or books (see page 11), and produced an even greater number of technical reports for government agencies and land managers, wherever possible providing general guidelines and/or specific suggestions for improving land management and bolstering bird conservation efforts. We have given numerous talks at scientific meetings, conducted workshops on monitoring techniques and conservation challenges throughout the US and the Neotropics (see page 9), pioneered the development of web-based decision support tools for land managers (see page 6), and perhaps most importantly, continued to develop collaborative relationships with land managers and other conservation partners (see page 10) across the US and beyond.

Our successes would not be possible without the tremendous contributions from you—IBP's supporters, partners, board members, seasonal field crews, and year-round staff. The challenges we face are huge, but if we continue to strive, together we can have an even greater effect on the conservation of bird populations and their habitats.



In gratitude for your support,

Rodney Siegel, Ph.D.  
 Executive Director



# IBP's Major Programs

Below we briefly describe IBP's major programs. The pages that follow highlight current activities within several of these programs that are making a difference in the study and conservation of bird populations and their habitats.

## The MAPS Program



The Monitoring Avian Productivity and Survivorship (MAPS) program is a network of bird banding stations operated by public agencies, private organizations, and individual bird banders across North America, and coordinated by IBP. MAPS monitors the demographic rates of more than 150 landbird species. IBP coordinates the efforts of hundreds of independent MAPS operators, and also

directly staffs dozens of MAPS stations on public lands. IBP scientists analyze MAPS data at multiple spatial scales—from local to continental—to help resource managers and environmental decision-makers assess the impacts of climate change and other ecological stressors, and develop and test bird conservation strategies.

## The MoSI Program

MAPS data indicate that declines in some species of Neotropical migratory birds may be caused more by low survival on their wintering grounds or during migration than by low productivity on their US breeding grounds. IBP and partners in the Neotropics established and coordinate the MoSI (*Monitoreo de Sobrevivencia Invernal*) Program, a cooperative network of bird banding stations operated during the winter to monitor winter survival and late winter physical condition of migratory and resident birds across the northern Neotropics.



## Bander Training



IBP builds research and monitoring capacity by training new bird banders and enhancing the skills of established banders, both in the United States and in the Neotropics.

## IBP's Sierra Nevada Bird Observatory

IBP's Sierra Nevada Bird Observatory encompasses an array of projects studying and conserving bird populations throughout California's Sierra Nevada mountains. IBP scientists work closely with land managers to develop strategies for maintaining viable bird populations and diverse bird communities. Current projects include studies of Spotted



Owl responses to wildfire, collaboration with the Forest Service to monitor Black-backed Woodpecker populations in burned areas, developing a standardized protocol for assessing bird communities at Sierra Nevada meadows, helping the Forest

Service to evaluate bird species for Sensitive Species status across its Pacific Southwest region, and continuing MAPS monitoring at Yosemite and Kings Canyon National Parks.

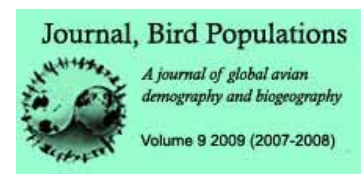
## Avian Inventory Program

In addition to MAPS demographic monitoring, IBP uses many other techniques to assess avian diversity, distribution, and abundance on public and private lands, often partnering with federal or state agencies. Current projects include using point counts to monitor avian population trends across five Pacific Northwest national parks, censusing Spotted Owls in North Cascades National Park, and analyzing data collected by 'citizen-scientists' for IBP's California-wide Burrowing Owl survey.



## Bird Populations Journal

*Bird Populations* is IBP's on-line journal ([www.birdpop.org](http://www.birdpop.org)) publishing peer-reviewed research papers, reports from avian monitoring projects around the world, and articles and commentary addressing avian demography and biogeography.



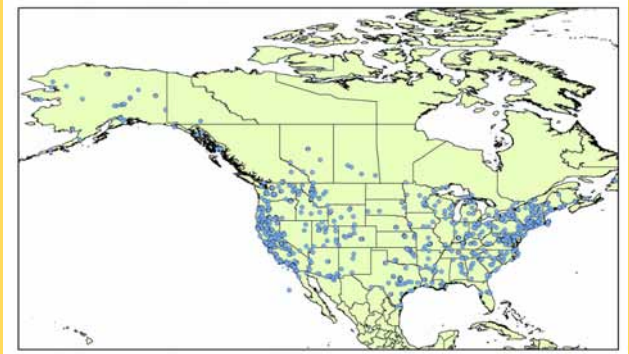
***“I have been impressed with the management tools that the MAPS project provides natural resource managers...these tools are an integral part of implementing Integrated Natural Resource Management Plan population measures for migratory birds.”***

Kenneth G. Knouf, former Natural Resource Manager, Jefferson Proving Ground/Big Oaks National Wildlife Refuge

## The MAPS Program

***Below: Over 1,000 MAPS stations have been established across the U.S. and Canada since the program began in 1989.***

**Providing critical information for natural resource management and bird conservation at multiple spatial scales.**



**IBP researchers are using cutting-edge science to learn important conservation lessons from the vast MAPS mark-recapture database, and are sharing those lessons with land managers and the broader scientific community through both traditional and innovative means. Here we highlight research results relating to Wood Thrush, a declining species of high conservation concern, as an example of how we are putting MAPS data to use for science and conservation.**

Above: A Wood Thrush is fitted with a leg band prior to being released.

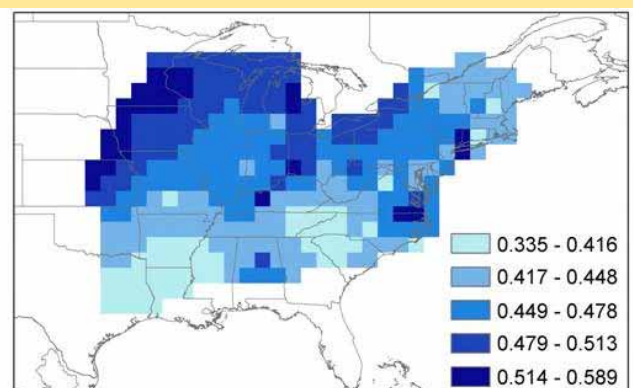
### **Using MAPS to assess spatial variation in avian vital rates and population changes at the continental scale**

A main goal of MAPS is to identify and understand patterns of spatial variation in vital rates. In collaboration with researchers at the USGS Patuxent Wildlife Research Center, IBP scientists are developing cutting-edge methods of modeling mark-recapture data. Application of these methods to MAPS data is providing new insights into patterns of vital rates and a new perspective on the spatial scales at which those patterns occur. For example, to the right we show the pattern of spatial variation in adult apparent survival rates for Wood Thrush, a declining species of high conservation concern.

Regions with low Wood Thrush apparent survival coincide with regions that the North American Breeding Bird Survey suggests are experiencing severe population declines, indicating that survival, rather than reproductive success, is

likely the demographic parameter that could most successfully be targeted to reverse population declines.

***Below: Apparent survival probability for Wood Thrush predicted at the scale of 1-degree blocks. Estimates were derived from a spatial model applied to MAPS data from 187 stations operated between 1992 and 2003.***

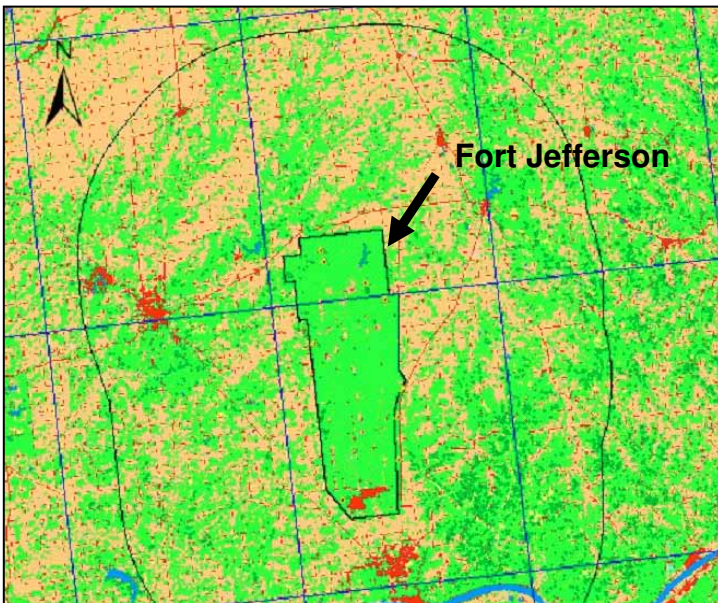


## Identifying proximate causes of broad-scale population declines

Identifying spatial variation in vital rates is just one component of the larger MAPS goal of understanding how such variation translates to population change. We continued to make strides toward this end over the past year, completing a preliminary analysis examining spatial variation in adult survival rates, recruitment rates, productivity, and population trends estimated from 12 years of MAPS data for 38 Neotropical migratory bird species at the spatial scale of Bird Conservation Regions. For most species, recruitment appeared to be the principal demographic driver, suggesting that poor first-year survival likely plays a strong role in effecting population declines. In the coming year, we intend to build on these results with an analysis of a larger set of species (including resident and short-distance migrants), a longer time-frame (15 years), and a complete examination of both temporal and spatial variation.

## Developing decision-support tools to help local and regional resource managers conserve bird populations

In addition to collating and analyzing data from independent operators, IBP works directly with land managers to use MAPS demographic monitoring as a tool for developing and refining habitat management and bird conservation strategies at local and regional scales. One such partner is the Department of Defense (DoD), with which we have operated a demographic monitoring network across numerous military installations in the eastern US since 1993. Many of these installations provide regionally important mature forest *refugia* for sensitive species like Wood Thrush.



**Above:** Analysis of remote-sensed land cover around MAPS stations at Fort Jefferson, IN, reveal the base's importance in maintaining unfragmented forest (indicated in green; agricultural areas are indicated in orange), an important factor for Wood Thrush demographic performance.

Metric	CRAN	JEFF	KNOX
Total Forest Area (ha)	230	196	319
Core Forest Area (ha)	169	177	156
Core Forest Percent	73%	80%	55%
Wood Thrush Reproductive Index	0.406	0.356	0.308

**Above:** Comparison of landscape metrics and MAPS-derived reproductive indices at three military installations (Crane Naval Surface Warfare Center, IN; Jefferson Proving Ground, IN [now managed by USFWS as Big Oaks NWR]; and Fort Knox, KY) in the Central Hardwoods Bird Conservation Region.

Analysis of Wood Thrush data from MAPS have yielded specific management prescriptions for sustaining robust populations with high reproductive success, such as maintaining landscapes with at least 1,250 ha of forest with >60% canopy closure and a minimum mean forest patch size of 20 ha.

DoD-MAPS monitoring is now bearing even more fruit as we synthesize multi-year results in conjunction with remote-sensed land cover and weather data to create web-based 'decision-support tools' that can help land managers integrate the needs of bird species of concern, such as Wood Thrush, into their natural resource management plans. These decision-support tools include:

- GIS applications that analyze 'before' and 'after' landscape management scenarios.
- Pre-programmed spreadsheets designed to predict the likely impacts of various management scenarios on demographic rates of target species.
- 'Species Management Accounts' synthesizing management recommendations.

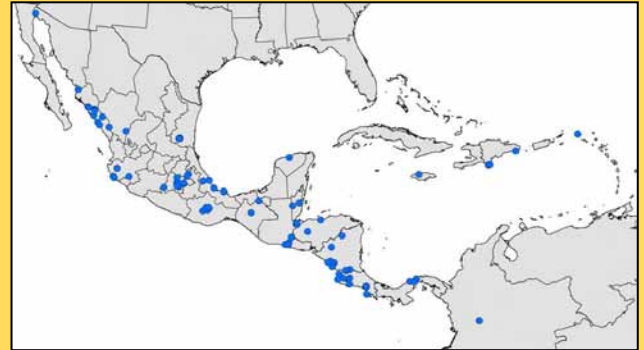
Similar sets of tools and additional analyses and tools that provide critical information on the effects of climate change are also under development for the Pacific Northwest Region (WA/OR) of the US Forest Service, which has partnered with IBP to operate a network of 36 MAPS stations across six national forests since 1992.



# The MoSI Program

*Below: More than 130 winter demographic bird monitoring stations have been established in the northern Neotropics since the program began in 2002.*

***Monitoreo de Sobrevivencia Invernal: Coordinated, cooperative monitoring of long-distance migratory and resident birds throughout the Neotropics.***



## **Enhancing conservation capacity in the Neotropics through technical training and network building**

MoSI's broad goals are to assess winter habitat quality for migrant and resident birds by relating winter site persistence, between-year return rates, and body condition of birds to habitat variables and to use these data to inform management and conservation efforts. IBP personnel lead workshops in the Neotropics to train current and aspiring MoSI station operators. In addition to training, these workshops provide forums for communication and discussion among MoSI partners. IBP has held MoSI banding or data-analysis workshops in Mexico, Belize, Guatemala, El Salvador, Nicaragua, Costa Rica, Panama, and Colombia.



**Above: Luis Soto and Jaime Talavera at a 2009 MoSI workshop in Belize.**

Luis and Jaime, who work with students from the National University in Honduras to operate a MoSI station in La Tigre National Park, Honduras, received partial scholarships from IBP to participate in the workshop. *Inset: Students at the workshop study their field guide.*

## **Linking MoSI and MAPS: winter and breeding season monitoring**

Collecting standardized bird banding data at monitoring stations, in both the temperate zone during the breeding season and the tropical latitudes during the winter, provides a fuller picture of critical life-cycle stages and habitat needs than either effort could yield alone. It also provides opportunities to determine migratory connectivity—that is, to identify where in the Neotropics specific populations of North American-breeding birds spend the winter.

In 2009 IBP collaborated with the Neotropical Migrant Conservation Genetics Project at UCLA's Center for Tropical Research by collecting feather and cloacal swab samples at MAPS and MoSI stations for genetic and stable isotope analyses, which can be used to link breeding and wintering populations. IBP scientists are also investigating spatial variation in morphometric data as a complementary means of assessing migratory connectivity. For example, wing length data collected on Swainson's Thrushes at MAPS and MoSI stations show that the longest-winged birds tend to breed farthest north and winter farthest south, a pattern that is corroborated by isotopic and genetic data.



**Left: Spatial variation in Swainson's Thrush wing length from MAPS and MoSI data. Question marks highlight areas with large geographic gaps in the distribution of MAPS stations.**

# Where do birds molt?

## IBP scientists advance the state of knowledge on a neglected but critical component of the avian life cycle.

For many decades conventional wisdom suggested a fairly simple model of bird migration: many birds fly south to the tropics for the winter and then fly north in the spring to return to breeding territories in the temperate latitudes.

At some point the paradigm was broadened to acknowledge that many migratory birds have winter as well as summer territories, between which they commute on an annual basis—back and forth as quickly and directly as possible. But new research, including work by IBP scientists, is revealing even this to be an oversimplification for many migratory bird species—there may be more migrations outside of these two-way highways than anyone ever imagined.

In a recent issue of the journal *Condor*, IBP scientists reported on studies of birds that fly from California and the Great Basin to the monsoon area of Arizona and northwestern Mexico to molt in late summer, before continuing on to wintering grounds in southern Mexico and Central America. We summarized data on 10 such species previously known to be ‘molt-migrants’, but for nine other species, such as Green-tailed Towhee, Nashville Warbler, and Chipping Sparrow, we also found at least a few individuals molting far outside both breeding and wintering ranges. We concluded that birds probably make individual choices on an annual basis about where to molt relative to the breeding grounds, perhaps in response to factors like length and success of the breeding season, weather, and the distribution of food resources following the breeding season in any particular year.

Unlike breeding locations and migratory routes, little is known about precisely where birds molt following breeding, because most birds become very secretive during this time and because ornithologists historically disdained collecting molting birds with disheveled appearances. Birds need certain nutrients to complete their molt, and they also

require thick vegetation in which to hide. These particular needs may not always be satisfied on their breeding territories, so the flexibility to migrate to better molting grounds would make adaptive sense. Preliminary evidence suggests that even in species such as Swainson’s Thrush that were always assumed to molt on their breeding territories, some individuals indeed do so, while others may move a few km or even hundreds of km to molt.



## How much molt-migration occurs within other species?

A large part of the answer may lie in the more than 1.5 million bird banding records that constitute the MAPS dataset. Detailed information on plumage, molt, and breeding condition of birds captured at MAPS stations may allow us to tease out whether some species have distinct

areas—and distinct habitats—for breeding versus molting. Understanding where birds molt is essential for conservation, for if we are not conserving critical areas and habitats for molting, conservation efforts aimed strictly at breeding and wintering habitats may not be adequate.

**Below and center of page: Molt data from mist-netted birds can aid conservation efforts by identifying areas and habitats critical for molt-migration.**





# Forest birds and wildfire in the Sierra Nevada

Few agents of ecological change can reshape bird communities as rapidly as wildfire. Particularly in western North America, climate change and increasing fire frequency are already providing major challenges to land managers working to conserve bird populations. Through research conducted by its **Sierra Nevada Bird Observatory**, IBP is helping land managers unravel the complex relationships between bird species of concern, forest management, and wildfire in the Sierra Nevada.

## Black-backed Woodpecker Monitoring and Management

The Sierra Nevada is the most southerly portion of the range of the Black-backed Woodpecker. Black-backed Woodpeckers are most abundant in the Sierra (and



elsewhere in their range) in stands of recently fire-killed trees, where they forage on wood-boring beetle larvae that colonize dead trees in large numbers almost immediately after fires.

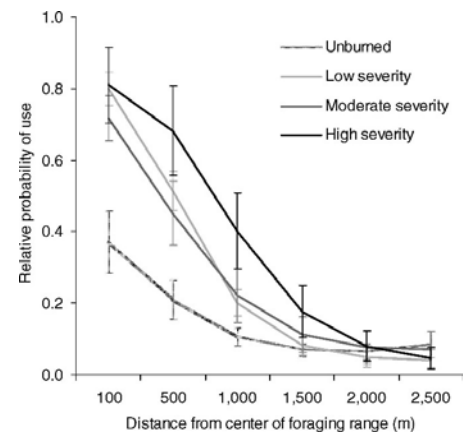
Black-backed Woodpeckers' strong affinity for stands of dead trees makes their population vulnerable to excessive post-fire salvage logging and other management activities that might reduce the

number of recently killed trees across the Sierra landscape. IBP is partnering with the US Forest Service to monitor Black-backed Woodpecker populations across ten national forests in the Sierra Nevada. Our project is providing Forest Service personnel with information needed to safeguard the Sierra Nevada's Black-backed Woodpecker population, as well as other bird species with an affinity for burned areas.

## Use of Post-fire Landscapes by California Spotted Owls

IBP scientists are engaged in pioneering research on the impacts of wildfire on Spotted Owls. Severe fire is often viewed as a major threat to the species, but our Sierra Nevada field studies revealed that Spotted Owls whose territories had recently burned in mixed-severity fires preferentially foraged in high-severity burn patches (see

figure, right), and appeared able to thrive in partially burned landscapes, at least in the initial years after wildfire. These results have important implications for post-fire timber salvage projects, and more generally, for the management of recently burned forest stands throughout the Sierra Nevada.



We have presented our results to the *Northern Spotted Owl Federal Recovery Team* and prepared several manuscripts for publication. One of these manuscripts was recently published in the *Journal of Wildlife Management*.

**Below:** A parent and juvenile Spotted Owl near their nest in a recently burned area of our study site on Sequoia National Forest.



France Dewaghe

## Bird monitoring and management in

# Pacific Northwest National Parks

Since 2001 IBP scientists have been working closely with NPS personnel, particularly Bob Kuntz at North Cascades National Park, to design and implement bird monitoring projects at five national parks in the Pacific Northwest (see map, below). Our projects provide park resource managers with information to help manage bird populations and their habitats. Our studies also make use of national parks as reference sites, where the effects of regional and global processes like climate change can be studied without the confounding effects of factors like urbanization and commercial timber harvest.

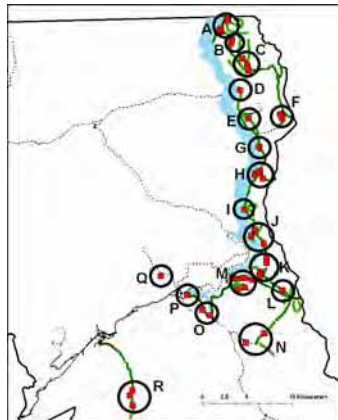


In 2009 we implemented the third year of long-term landbird monitoring in the parks, continuing a project that uses annual backcountry bird counts to assess population trends of dozens of species. Some of these species,

particularly those that breed in the subalpine zone, are very poorly monitored by other bird monitoring programs elsewhere in the region.

We also completed our third season of a park-wide re-census of Northern Spotted Owls in North Cascades National Park, where this endangered species had not been systematically inventoried in over ten years. Our 2009 field season in the park's upper Skagit River watershed revealed a severe paucity of Spotted Owls and a remarkably high density of invasive Barred Owls (see figure, right), which appear to have substantially increased in abundance since the previous Spotted Owl census in the early 1990s.

*Below:* Barred Owl detections (red squares, grouped by circles into distinct Barred Owl territories) along Spotted Owl survey transects (green lines) during our 2009 survey in North Cascades National Park.



Crew leader Mandy Holmgren completes data forms after conducting a point count in Olympic National Park.

Barred Owls are considered one of the major threats to the persistence of Spotted Owls throughout the Pacific Northwest. In addition to locating remaining Spotted Owls and assessing their reproductive success, we are helping park service personnel prepare management plans for each of the remaining Spotted Owl territories.

### **Project update:** **California Burrowing Owl Survey**

*After a lengthy hiatus while we waited for critical funding that was delayed by California's state budget crisis, we are pleased that analysis of data from our California-wide Burrowing Owl survey in 2006-2007 is now nearly complete. Our survey harnessed volunteer effort of nearly 400 'citizen-scientists' across California to assess how the species' distribution and abundance has changed since the previous IBP-coordinated Burrowing Owl survey in the early 1990s. Our survey data are already being used by conservation planners and resource managers throughout California. We will be completing our data analysis and report to CA Dept. of Fish and Game by early 2010, and publishing results in peer-reviewed literature shortly thereafter.*



# Partnerships

**Robust partnerships with land managers, government agencies, private foundations, and other research and conservation organizations are critical to IBP's work. Partnerships help us to bridge the gap between science and management, allow for efficient leveraging of funding, and provide opportunities to develop new ideas and disseminate information effectively. We salute the many partners\*, listed below, who joined with us to conserve bird populations in 2009.**

*\*Independent contributors of MAPS and MoSI data are acknowledged separately in those programs' reports.*

American Bird Conservancy  
Avian Knowledge Network  
Avian Knowledge Alliance  
Balcones Canyonlands Preserve, TX  
Belize Foundation for Research and Environmental Education  
Birds of North America Online, Cornell Laboratory of Ornithology  
California Avian Data Center

Joint Institute for the Study of the Atmosphere and Ocean, University of Washington  
Klamath Bird Observatory  
Lewis and Clark National Historical Park, OR/WA  
Marine Corps Recruit Depot on Parris Island, SC  
Mount Rainier National Park, WA  
Mount Baker/Snoqualmie National Forest, WA  
Mount Hood National Forest, OR  
National Fish and Wildlife Foundation

Texas Army National Guard, Camp Bowie  
Texas Army National Guard, Camp Swift  
Texas Parks and Wildlife  
UCLA, Center for Tropical Research  
UCLA, Institute of the Environment  
UCLA, Dept. of Ecology & Evolutionary Biology  
Univ. Autónoma del Estado de Morelos, Mexico  
US Army Engineering & Support Center, AL  
US Army Fort Bragg, NC



## **PARTNER SPOTLIGHT:**

***Paul Radley, Division of Fish and Wildlife  
Commonwealth of the Northern Mariana Islands***

*"My first career experience in biology was serving as a MAPS intern at Flathead National Forest way back in 1993, my sophomore year in college. I viewed it as simply a great way to spend a summer living in a stunningly gorgeous location, banding birds and learning a skill I intended to make a part of my future career. As that summer progressed, I came to better understand what I was assisting IBP in doing—making strides in conserving and protecting avian populations through sound science, IBP's credo.*

*After a circuitous route I am now the ornithologist at the Commonwealth of the Northern Mariana Islands' Division of Fish and Wildlife (DFW). My job is to develop and oversee projects and research with the goal of protecting avian populations in the Northern Mariana archipelago. To this end, partnering with IBP to initiate MAPS on Saipan has been instrumental in acquiring baseline data on the island's avifauna. Because of cooperation with IBP, I feel that DFW is now more able to make sound, science-based decisions in regards to avian conservation in the Northern Marianas."*

California Burrowing Owl Consortium  
California Dept. of Fish and Game  
California Partners in Flight  
Colegio de Posgraduados, Mexico  
Commonwealth of the Northern Mariana Islands  
Department of Defense Legacy Resources Management Office  
Department of Defense Partners in Flight  
Environmental Studies on the Piedmont  
ESRI, Inc.  
Fauna y Flora Internacional, Nicaragua office  
Fort Leonard Wood, MO  
Fremont National Forest, OR  
Friends of Banshee Reeks Nature Preserve, VA  
Howell Woods Env. Learning Center, NC  
Hummingbird Monitoring Network  
Idaho Bird Observatory

National Oceanic and Atmospheric Administration  
Naval Facilities Engineering Command, Atlantic Division  
Naval Support Activity Crane, IN  
North Cascades National Park, WA  
North Carolina Cooperative Fish and Wildlife Research Unit  
Olympic National Park, WA  
Oregon/Washington Partners in Flight  
Partners in Flight Western Working Group  
PRBO Conservation Science  
SalvaNatura, El Salvador  
San Juan Island National Historical Park, WA  
Sequoia and Kings Canyon National Parks, CA  
Siuslaw National Forest, OR  
Slate Creek Press  
Sonoran Joint Venture

US Army Fort Hood, TX  
USDA Forest Service Northern Research Station  
USDA Forest Service Redwood Sciences Lab.  
USDA Forest Service Region 5  
USDA Forest Service Region 6  
US Environmental Protection Agency  
USGS Patuxent Wildlife Research Center  
USFWS, Division of Bird Habitat Conservation  
US Fish and Wildlife Service, Region 3  
US Fish and Wildlife Service, Region 6  
US NIH National Institutes of Allergy and Infectious Diseases  
USA National Phenology Network  
Wenatchee National Forest, WA  
Western Hummingbirds Partnership  
Willamette National Forest, OR  
Yosemite National Park, CA

# IBP publications and selected reports, 2008-2009

## Peer-reviewed Publications

Bond, M. L., D. E. Lee, and R. B. Siegel. *In review*. Fall and winter movements and habitat use by California Spotted Owls in a burned landscape. *Western Birds*.

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

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