

The New Bird Atlas

A Call to Action for Connecticut's Conservationists



2017

The New Bird Atlas

A Call to Action for Connecticut's Conservationists



Connecticut State of the Birds

www.ctaudubon.org

Editors

Tom Andersen
Milan Bull
Charles Watson

Graphic Design

Paul J. Fusco
Julian Hough

Printed by
Graphic Image
Milford, CT



Copyright 2017
Connecticut Audubon Society

Table of Contents

Introduction	
<i>It's Your Project!</i>	1
Milan G. Bull	
The New Atlas Will Bring Our Knowledge of Connecticut's Bird Life Up-to-date	4
Rob Klee	
Using Science to Conserve Birds	8
Chris S. Elphick	
10 Good Reasons to Participate!	14
Patrick Comins	
Atlasing, Data Collection & How it Shapes Our Knowledge of Bird Distribution	18, 19
Volunteering for the First Atlas	
<i>"The joys that come from serious observation"</i>	20
Stephen P. Broker	
Wise Use of Conservation Funding Demands a Foundation of Sound Science	24
Min T. Huang	
A Regional Perspective:	
<i>How Do Connecticut's Breeding Bird Atlases Contribute to Bird Conservation?</i>	28
Randy Dettmers	
How Breeding Bird Atlases Can Lead to Conservation Improvements	32
Daniel Brauning	
About The Authors	35

Front cover:

Connecticut's Bird Atlas Project is an exciting endeavor on many levels.
Photos by Julian Hough and Paul J. Fusco

Back cover:

Roseate Tern
Photo by Julian Hough

Introduction

It's Your Project!

Milan G. Bull

Senior Director of Science and Conservation

Connecticut Audubon Society



PHOTO BY ABIGAIL RAY KOZEL

Any conservation management decision, whether federal, state, or local, must be based on scientific, fact-based information. This is especially true for bird conservation when diminishing resources of both land and funding are reducing our ability to provide landscape-wide habitat protection needed to protect and enhance our bird populations.

Future decisions can be effective only if we understand what birds are here, and where they are breeding, wintering, and congregating during migration.

An excellent opportunity to move this effort forward in Connecticut is about to take place, as the University of Connecticut and the Connecticut Department of Energy and Environmental Protection launch an ambitious program to survey bird populations across the state using scientists—citizen scientists as well as skilled professionals—to census our state's bird populations. This Connecticut Bird Atlas will be the second such atlas conducted in our state.

This year we have only one major recommendation: if Connecticut's birds are important to you, learn

as much as you can about the project and then volunteer to participate!

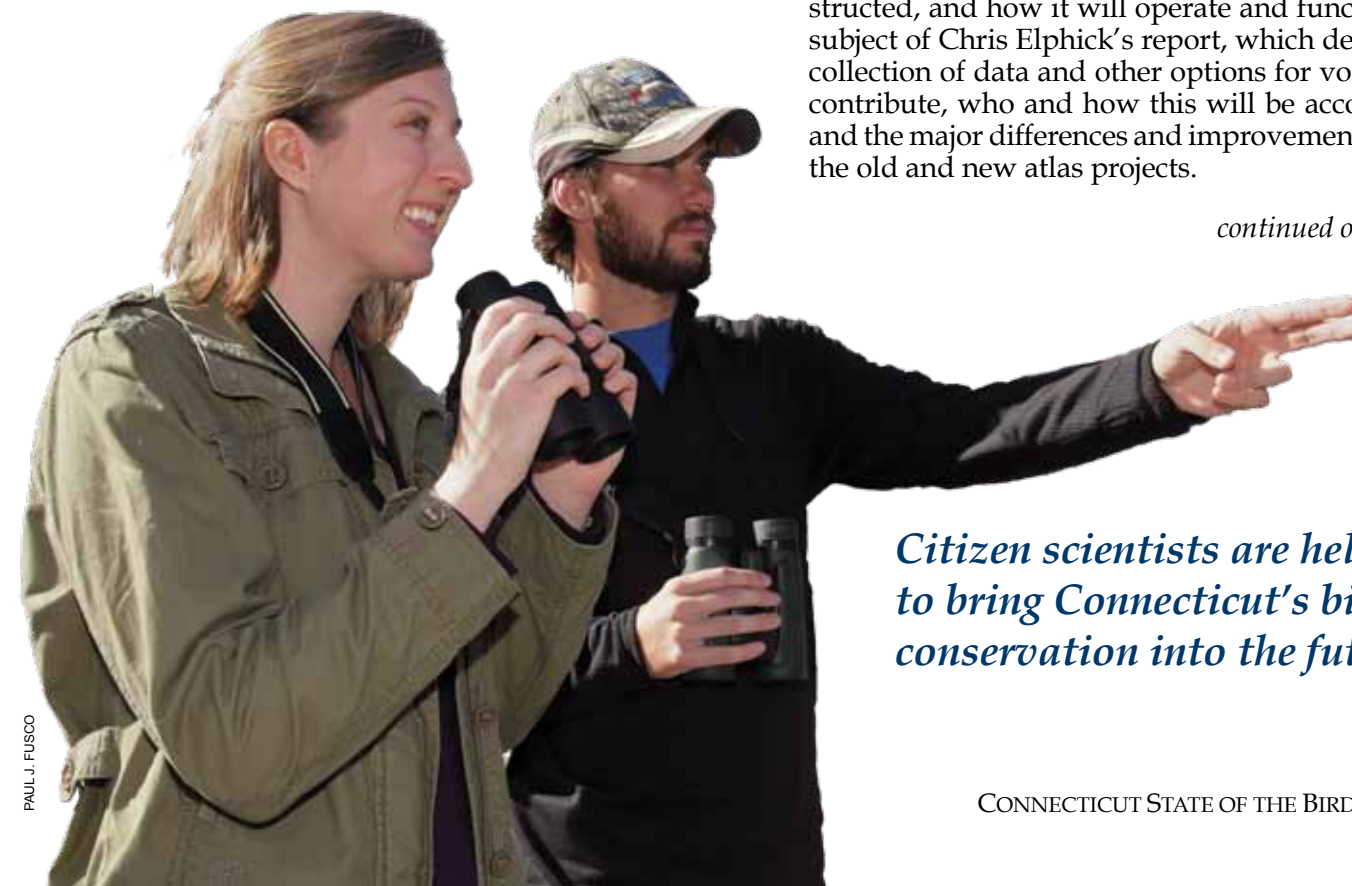
Because of arguments and altercations over data ownership, *The Handbook of the Connecticut Breeding Bird Atlas 1982-1986* wasn't published until eight years later, in 1994, and is already becoming out of date. The new atlas, being entirely digital and

nearly virtual in scope, will avoid the major publishing mistakes, delays, and mishandling that plagued the 1994 atlas. Also, the new atlas will be called a Bird Atlas as opposed to a Breeding Bird Atlas, as it will contain a wealth of information about migration and wintering bird populations.

Effective stewardship of our natural resources depends upon our knowledge of these resources. This is the focus of Rob Klee's article, which emphasizes that documenting abundance, distribution, and species composition of our breeding bird populations, as well as wintering populations and migratory stop-over and habitat use, will enable our regulatory agency to manage these resources more effectively.

The details of how the new atlas project is constructed, and how it will operate and function, is the subject of Chris Elphick's report, which describes the collection of data and other options for volunteers to contribute, who and how this will be accomplished, and the major differences and improvements between the old and new atlas projects.

continued on next page



Citizen scientists are helping to bring Connecticut's bird conservation into the future.

Introduction, continued from page 1

Connecticut Audubon executive director Patrick Comins describes his excitement and enthusiasm about the new atlas project, lamenting the fact that he missed taking part in the previous one! Patrick outlines 10 reasons why every birder should be thrilled to participate in the new project and looking forward to it as much as he.

If you missed the last atlas project and are interested to learn exactly what it is like to participate, don't miss Steven Broker's personal account of his involvement in this exciting field work as he recounts some of the highlights of his atlas work on West Rock Ridge State Park in New Haven County. Besides scrambling down slopes and working past cliff faces to find Red-tailed Hawk nests and Great Horned Owlets, Steve found a Green Heron nest with young on Konold's Pond. Altogether, Steve confirmed a total of 113 species, one of only 35 survey blocks that recorded over 100 species.

Min Huang, Connecticut DEEP wildlife biologist and participating atlas sponsor, describes the goal and objectives of the project, including a better understanding of the habitat requirements and associations of the bird species of greatest conservation need, as well as the knowledge needed to better inform land use decisions by federal, state, and municipal governments.

A regional perspective on the importance of state

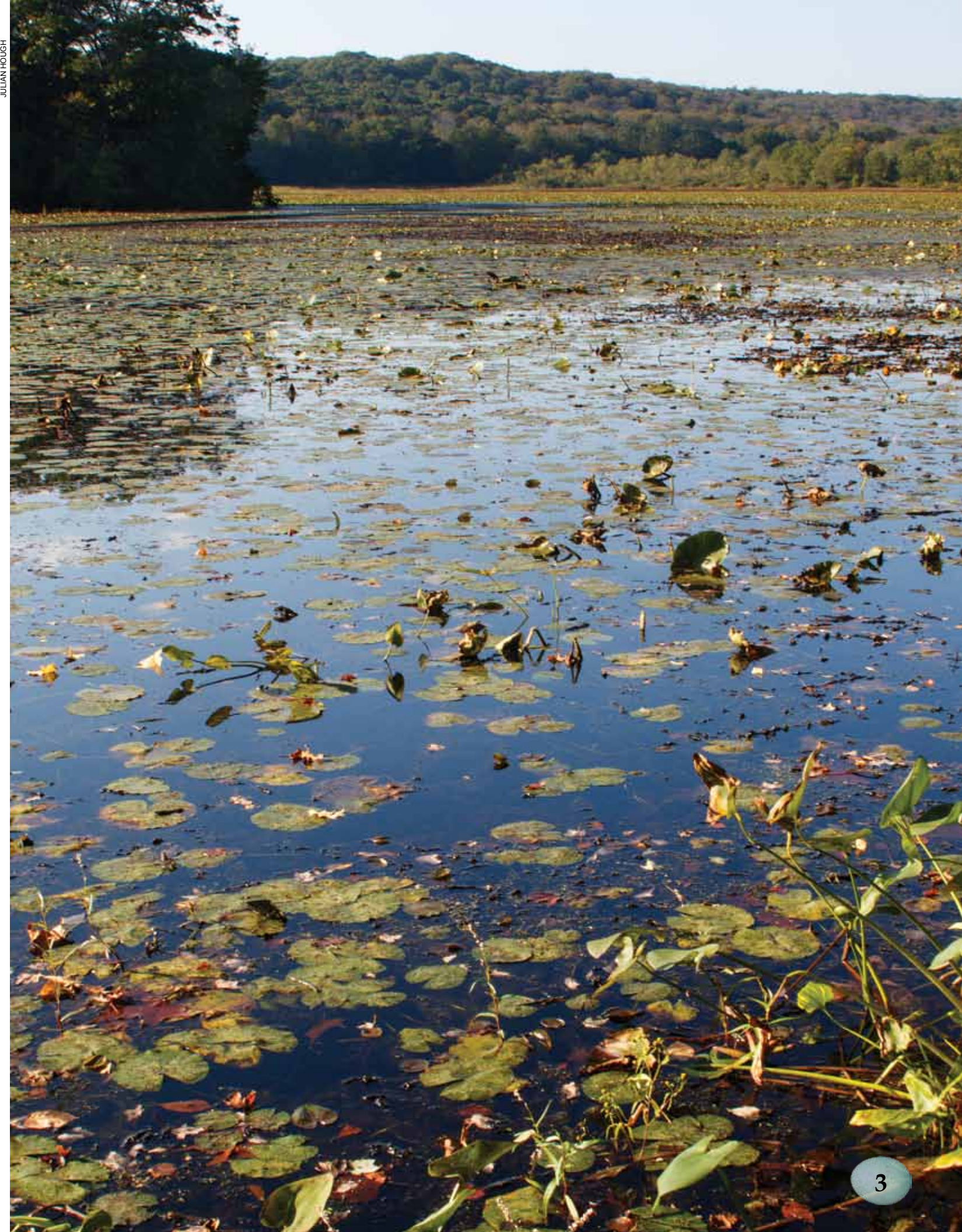
atlas projects is provided by Randy Dettmers, senior migratory bird biologist with the U.S. Fish and Wildlife Service. Randy describes how the larger picture of the status of bird populations would be incomplete without each state's piece. As often stated, birds don't recognize boundaries, so each state's atlas plays an important role in our overall understanding of the distribution and breeding ecology of our bird community.

Finally, Dan Brauning, supervisor of the Wildlife Diversity Program for the Pennsylvania Game Commission, provides us with a case study of how the Pennsylvania Bird Atlas has moved forward the conservation and management of bird populations in Pennsylvania by providing data sets that support the decision process of prioritizing a wide variety of bird conservation efforts.

A great opportunity lies before us to do something that will truly make a big difference in helping conserve and manage our bird populations. We are off to a good start, and we are certain that the birding community will step up to the challenge, enjoy some days afield, and provide valuable information about the breadth and scope of Connecticut's bird populations.

Happy birding!

* * * * *



JULIAN HOUGH



PAUL J. FUSCO

Habitat transitions from grass and field to scrubland edge to forest, like this, are typical locations where volunteers will be doing their surveys.

The New Atlas Will Bring Our Knowledge of Connecticut's Bird Life Up-to-date

Rob Klee
Commissioner
Connecticut Department of Energy and Environmental Protection

Information is the key to good decision making. That is especially true when it comes to effective stewardship of our natural resources. The conservation and management of our public trust resources are complex and require a level of detail that goes beyond simply knowing, for example, that Black-capped Chickadees occur in Connecticut. If we want to make sure chickadees remain in Connecticut for future generations to enjoy we must know more. Are they found in certain places but not others? Do they need special habitats to nest and

raise young? What do they need to survive our New England winters? Do they need forest cover to allow them to move from place to place and respond to changes in food availability or plant communities? Now, imagine needing that information—not just for chickadees but for all the birds that can be found in Connecticut. This is exactly the need the Connecticut Bird Atlas Project was created to address.

While the first *Atlas of Breeding Birds in Connecticut*, published in 1994, has served us well, many changes have occurred over the

past three decades that impact where birds are found in the state:

Development and road creation have fragmented habitats, which may benefit birds that are generalists but have a more detrimental impact on species that require large blocks of closed canopy forest.

Reforestation has helped birds that use both mixed hardwood and coniferous forest, but it creates new challenges for birds that rely on early successional habitats.

Loss or conversion of agricultural lands has affected birds that prefer grasslands and old fields.

Because of climate change, some species that were considered “southern” during the 1980s now reside year-round in Connecticut. Milder winters and more variable climatic conditions have allowed many species to adapt to both breeding and overwintering here.

The new Bird Atlas Project is designed to bring our knowledge of Connecticut's bird life up-to-date. It will help us capture the changes in abundance, distribution, and species composition that have occurred over the past 30 years. It will also help us document not only the breeding portion of a bird's life history but also wintering populations and, ideally, migratory corridors and critical stopover habitat use.

The project will also document important changes in our bird life—some good and some bad—over the past several years. For example, it will record the decline of once common species, such as the Northern Bobwhite, and it will celebrate the amazing increases of other species, such as the Eastern Bluebird, which was considered localized or rare when data were collected in the 1980s but which is now found statewide.

It is hard to believe that when Connecticut's first atlas was published, Bald Eagles and Peregrine Falcons did not nest here and were still considered in need of protection under the federal Endangered



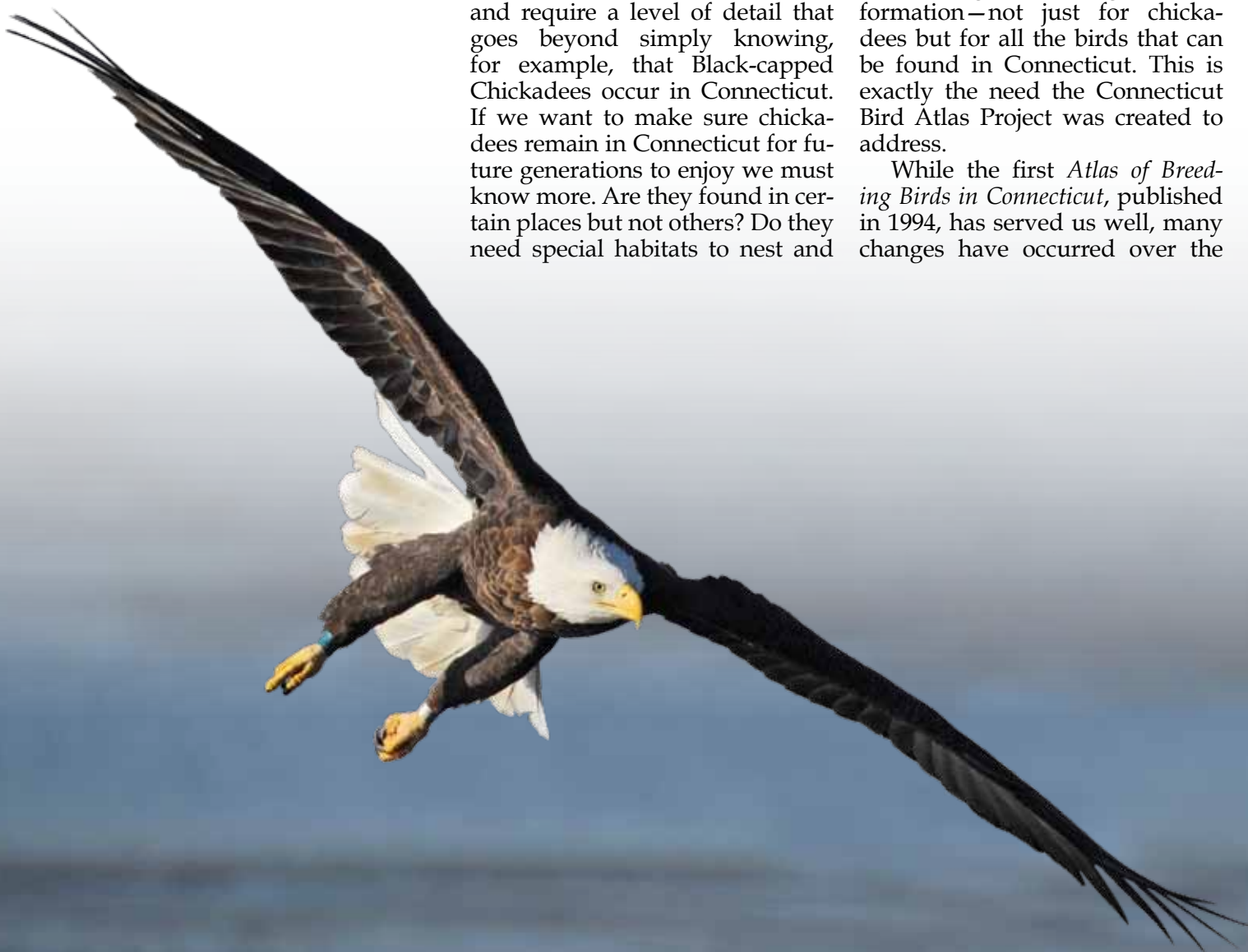
Northern Bobwhite, once common in Connecticut, are likely extirpated.



Black-capped Chickadees seem to be widespread in Connecticut.

Species Act. At that time, we had only 29 successful Osprey nests statewide, and the successful fledging rate for each pair was low. Today, this iconic species is thriving, with nearly 400 known active nests spanning a much larger area of the state.

The project will help us celebrate these conservation success stories, identify species of conservation concern, document species that are new to Connecticut, chronicle changes in breeding times and habitats, and give us a new picture of our bird life. Its real value goes





American Goldfinch
PHOTO BY PAUL J. FUSCO

far beyond that and is much more subtle than documenting the rapid pace of change. It comes back to the power of information and sound science in management and conservation.

One of the eight elements Congress required of fish and wildlife agencies through the State Wildlife Grants Program, and a foundational component of the Wildlife Action Plans created by all states and U.S. territories, was to monitor the abundance and distribution of wildlife. That information then informs conservation efforts to benefit wildlife. The place-based data on bird species gathered through the atlas project capture the essence of this element. Connecticut's Wildlife Action Plan includes many conservation actions that are built upon this foundation.

For rare or declining species, the bird atlas project will provide information on what places are critical to protect in order to meet the habitat needs of the life history stages of a given species. The data will aid wildlife biologists and others in tracking population trends, such as species declines, habitat or range expansions, and responses to climate change. Learning more about key habitat associations for species of greatest conservation need will enable us to better conserve important migratory stopover sites, breeding areas, or movement corridors. Identifying and maintaining these sites makes birds more resilient to the effects of climate change by allowing them to shift more easily between blocks of suitable habitats.

Perhaps one of the greatest, yet least apparent, values of the Bird Atlas Project is the information it will provide for environmental impact assessments. Data on the abundance and distribution of birds to local land managers and municipalities can help them to make wise decisions about land use and land protection. It can also significantly contribute to landscape scale conservation



PAUL J. FUSCO

The Bird Atlas will identify critical habitat for American Oystercatchers.

planning. Borders mean nothing to birds. Looking beyond municipal and state borders to address the broader conservation needs of birds is critical to long-term success. Information from the new atlas will also help to establish conservation prioritization and provide a science-based way for determining where our actions will have the greatest value.

Connecticut's Bird Atlas Project is an exciting endeavor on many levels. For the volunteer birders who will help collect the field data, it will often provide an amazing glimpse into the lives of birds. For those who use the end result, it will

enable us to follow the guidance of Aldo Leopold with regard to "intelligent tinkering" and allow us to see broader patterns of ecosystem function and connection. It will help enhance and promote better stewardship at the local level. Ultimately, every resident of our state will reap the benefits of well-informed conservation actions for birds, and the abundant and amazingly diverse bird life Connecticut has to offer will be here for future generations to enjoy.

* * * * *

Using Science to Conserve Birds

Chris S. Elphick

Department of Ecology & Evolutionary Biology, Center for Conservation & Biodiversity, and Institute of Biological Risk, University of Connecticut

How many Cerulean Warblers are there in Connecticut? Is it possible that Black Rail still nest in the state? Where are the most important areas for Wood Thrush? Have Belted Kingfishers declined? These, and dozens of questions like them, have been debated in Connecticut ornithological circles in recent years, and – although there is lots of informed speculation – the answer is often that we simply do not know. The Connecticut Bird Atlas, which begins in earnest in spring 2018, will address many of these questions, providing a firmer scientific basis for conservation decisions throughout the state.

Although people have been mapping bird distributions for much longer, scientifically designed bird atlases began in the United Kingdom in the 1960s. Dozens of bird atlases have been produced since, at scales ranging from counties to countries to continents. Most have focused on breeding birds, but some have tackled non-breeding periods. Most simply document where each species occurs, but some also estimate abundance. And while the focus has largely been on documenting distributions, most have also made some attempt to explain the distributions in relation to habitats, land use, and other factors. Increasingly, atlases are being repeated with a primary goal of determining whether and how bird distributions are changing.

Connecticut conducted its first atlas in 1982-86, with the results published in 1994 as the Atlas of Breeding Birds of Connecticut, by Louis Bevier. The state was subdivided into a grid of 596 blocks, each of which was visited by volunteer birders to generate a list of species present during the breeding season and to determine how strong the evidence was that breeding occurred within the block. Breeding evidence was assessed by observing birds and assigning their

behaviors to pre-defined categories that represent possible, probable, and confirmed breeding. A bird simply heard singing within a block, for example, would be considered a possible breeder. A pair engaged in courtship behavior in suitable habitat, or a bird visiting a likely nest site, would be rated as probable breeders. And if a bird is seen carrying nest material, or its nest is discovered, its breeding would be considered confirmed.

This basic survey approach has been central to most bird atlases since the 1960s and has been largely codified in a handbook of recommended methods by the North American Ornithological Atlas Committee. As the vision of what a bird atlas can be has expanded, however, the variety of data collected and methods used have also grown. For



A singing Chestnut-sided Warbler would be considered a possible breeder.

JULIAN HOUGH (2)



We need to identify the most important areas for Wood Thrush.

PHOTO BY PAUL J. FUSCO

the new Connecticut atlas, we plan to draw on the full range of methods available to provide as comprehensive a view of the state's birds as we can achieve. We also plan to rely on the tremendous developments that have occurred in the field of statistical ecology in recent years to use the available data to better understand where birds occur, what determines their distribution patterns, and how their distributions will change under alternative scenarios.

Like many early atlases, the first Connecticut atlas aimed only to describe the breeding distributions of the state's birds. The new study will go much further, with survey efforts during both the breeding and non-breeding seasons, and data collection focused on describing both distributions and abundance patterns. The basic field work, however, will be similar to that of the first atlas, and will rely almost entirely on the hundreds of recreational birders that live in the state. Interested birders will select blocks that they would like to survey and will be asked to make several visits, on each of which they will record all the birds that they can find. During the breeding season, they will also record evidence of breeding. In winter, we will ask people to estimate bird numbers using methods similar to those used during Christmas Bird Counts.

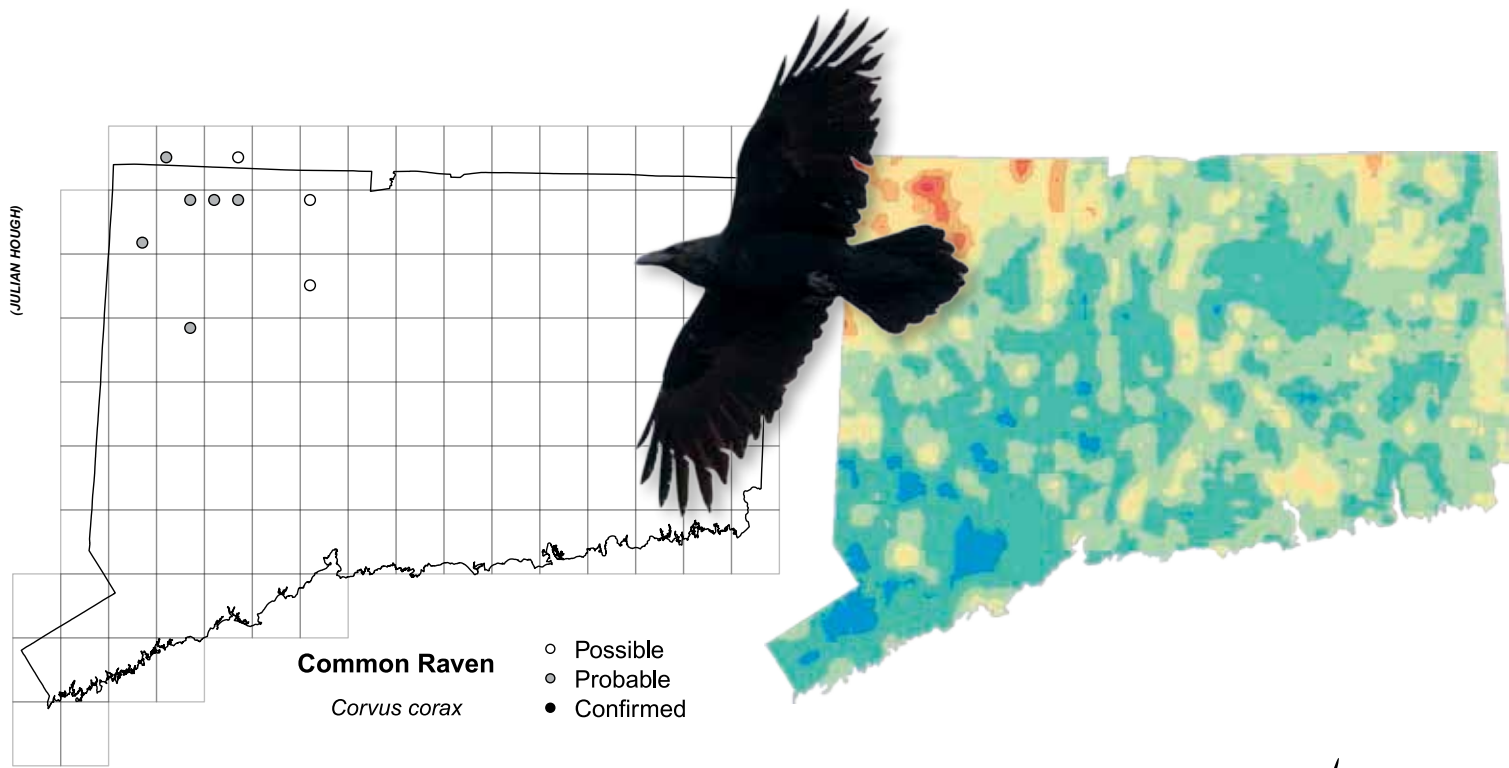
Over the course of the study, birders will be asked to visit as many of

continued on page 12

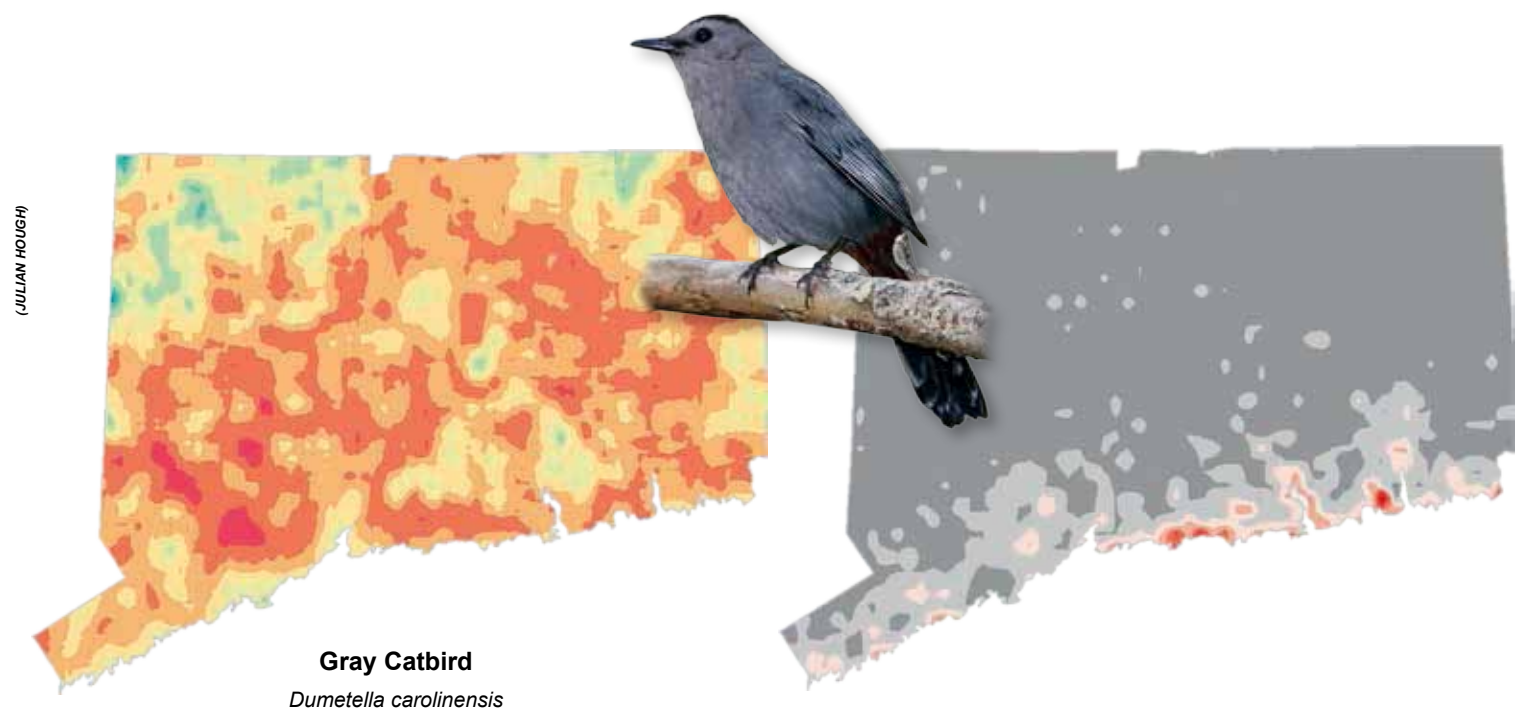


Volunteer participants will be able to submit data electronically.

JULIAN HOUGH



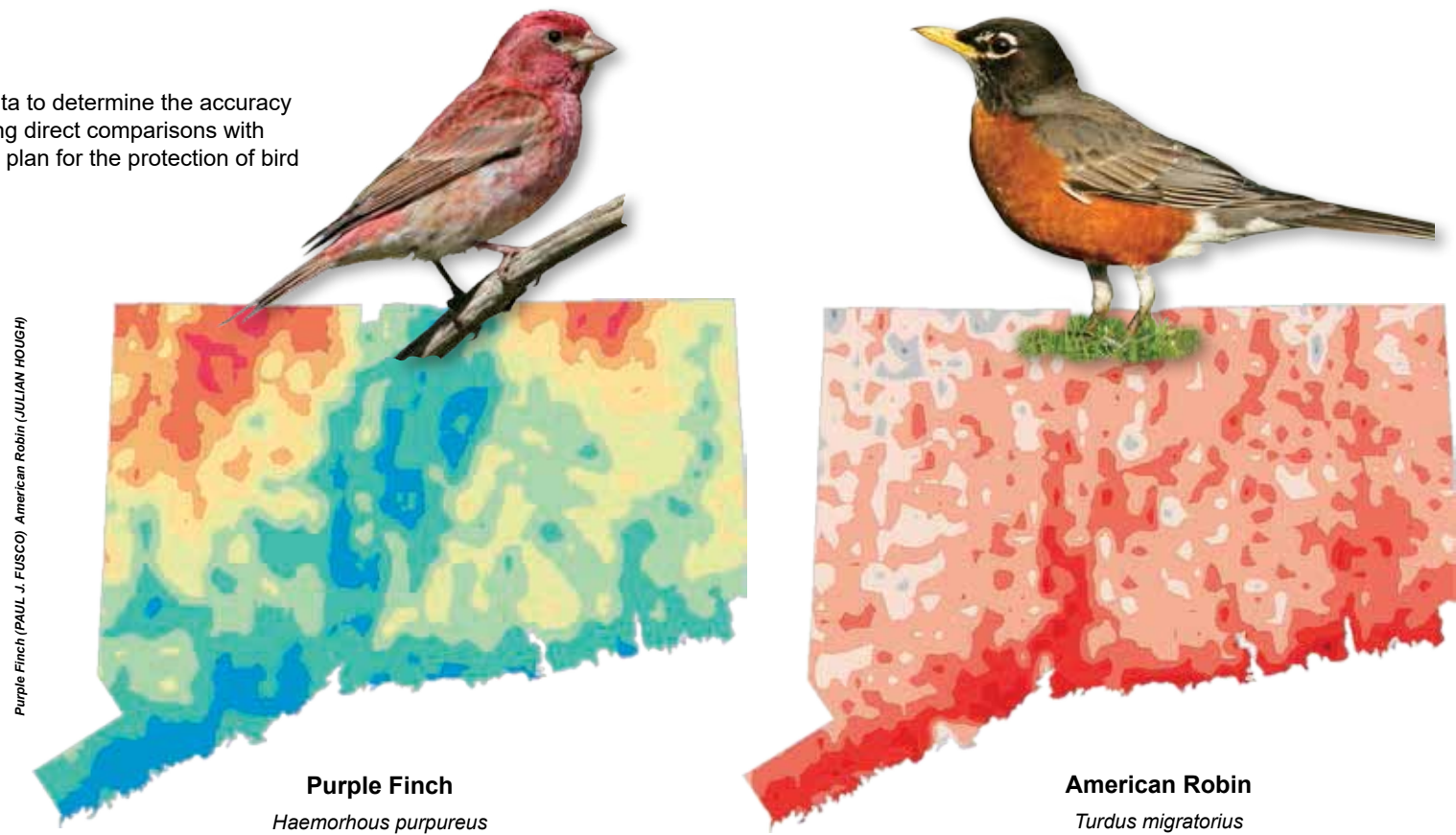
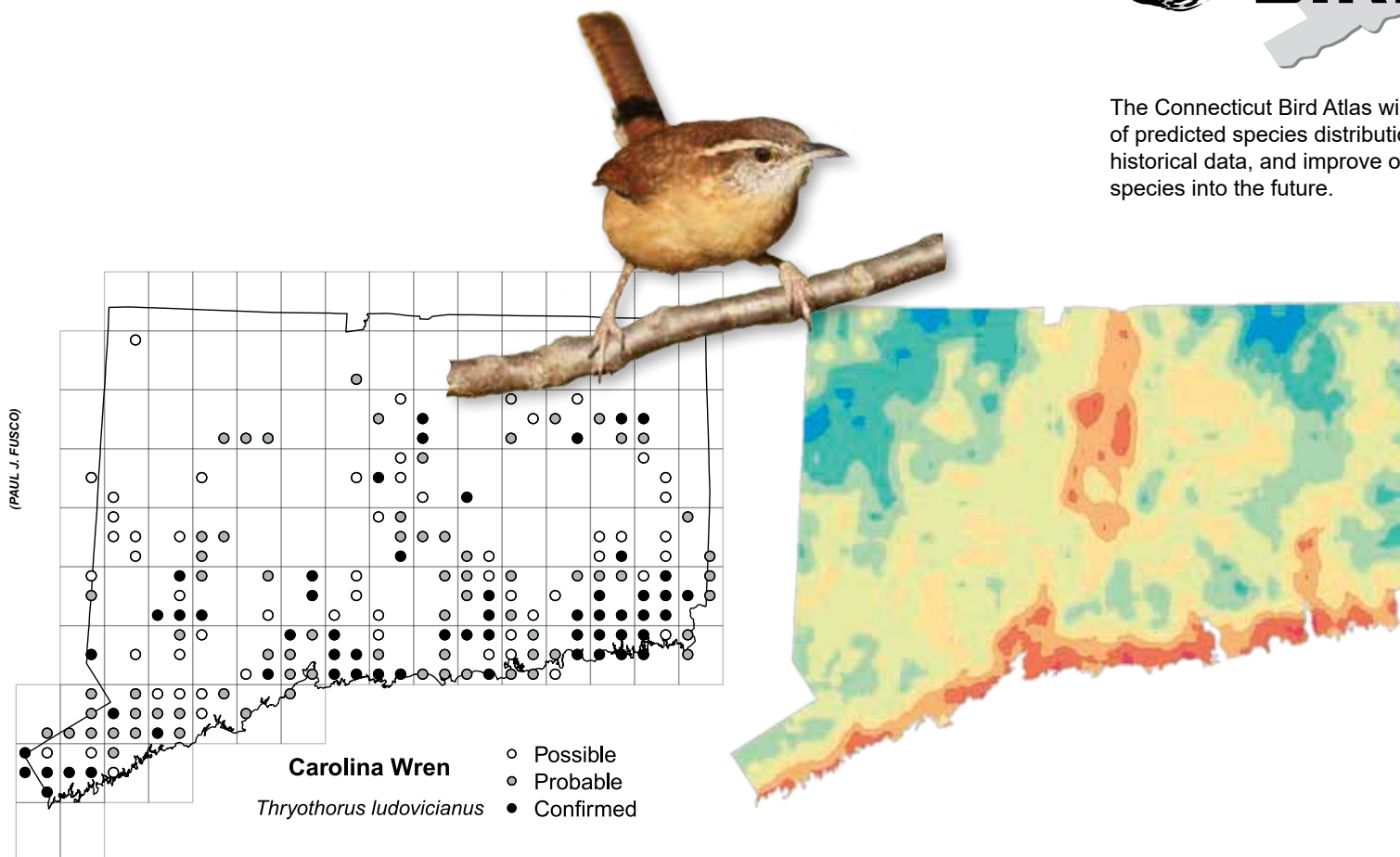
Distribution of Common Raven (*top*) and Carolina Wren (*bottom*) during the first breeding Atlas (*left*) compared to the predicted current distributions (*right*). The maps show how ravens have colonized the state since the 1980s and how Carolina Wrens have shifted north with warmer temperatures.



Predicted distribution of Gray Catbird during the breeding season (*left*) and winter (*right*), showing the expected contraction towards the coast in winter.

CONNECTICUT BIRD ATLAS

The Connecticut Bird Atlas will collect data to determine the accuracy of predicted species distributions, allowing direct comparisons with historical data, and improve our ability to plan for the protection of bird species into the future.



Predicted summer distribution of Purple Finch (*left*), which breeds mostly at higher elevations, compared to American Robin (*right*), which is much more widespread and especially common at lower elevations.

Predictive maps on pages 10, 11, and 19 by Valerie Steen et al. University of Connecticut



PAUL J. FUSCO

A sighting like this would confirm nesting Ruby-throated Hummingbird.

Using Science to Conserve Birds
continued from page 9

the block's habitats as possible to produce a complete list of species that occur within the block's boundary. Birders will be provided with a handbook describing the data collection methods in detail, and will have the option of submitting their data on a simple paper form or as an eBird checklist.

In addition to the basic data collection, birders will have several other ways to contribute. Those who do not have the time to take on surveys for an entire block can submit data just for their own property or for a local park or land trust property that they visit regularly. Less experienced birders, who do not feel comfortable surveying for all bird species, can also submit incidental records just for those species that they do know—for example, if they find nesting waterfowl on a local pond, or hear calling owls while out for an evening walk. More experienced birders who are willing to commit to learning additional count methods and to investing substantial time in surveys at assigned points can also opt to perform standardized point count surveys like those used for the USGS's Breeding Bird

Survey. These point count data will be combined with data collected by project technicians and used to estimate abundance and to quantify habitat use patterns. Full details of all atlas methods will be available on the project website this winter.

Although atlases have historically relied on exhaustive surveys that seek to obtain complete information on all survey blocks, achieving that goal can be logistically difficult and often takes five or six years of field work. Given the constraints on funding, and the important need to inform conservation decisions as soon as possible, the Connecticut project will take advantage of modern methods of data analysis to augment the field work and reduce the study's timeline. Our hope is to complete the project with only three years of surveys. To this end, we have compiled existing data sets collected for other research over the past few years and are using those data to make statistical predictions about how birds are distributed across the state (see map/figure X). Data collected in 2018-20 will be combined with the information in these preliminary maps to produce the final set of distribution maps for the atlas.

The mathematical models that underlie these statistical predictions will be central to the analysis of

the atlas data. These models will link the field data collected by birders to information on the distribution of different types of land cover (e.g., forests, fields, wetlands) and patterns of human development, both of which can be obtained from satellites and other remote sensing methods. Understanding these relationships mathematically will not only help to increase efficiency and reduce the overall cost of the atlas, but will provide us with the basis for predicting how birds will be affected by future changes to the landscape. For example, if our models tell us that certain species are consistently unlikely to be found near roads even when the habitat is otherwise suitable, then that information could be used to guide road-building projects. Similarly, if our models help identify a set of conditions that is consistently linked to the occurrence of a given species, then we can use that relationship to identify undiscovered places where the species might occur. In other studies, this approach has been used to find new populations of rare species.

Although the Connecticut atlas will rely more on modeling than has been typical in prior bird atlases, its success will still depend largely on the time invested by members of the Connecticut birding community. Field observations are crucially important both for building good models and for checking that the models produce good information. Without knowledgeable birders producing a large body of high-quality field observations, even the most sophisticated data analysis will come up short. But, by linking the expert knowledge of citizen scientists with the quantitative methods developed by ecologists, we anticipate that the Connecticut Bird Atlas will provide important advances not only for our understanding of the state's birds, but also for the way in which bird atlases are conducted in the future.

* * * * *

To learn more about the Atlas Project visit
<http://ctbirdatlas.org/>
or email ctbirdatlasvol@gmail.com



PAUL J. FUSCO (2)

Where do Black and White Warblers nest in Connecticut?



Brown Thrashers are a species of Special Concern in Connecticut.



Black-throated Green Warbler

PAUL J. FUSCO

10 Good Reasons to Participate

*Patrick Comins
Executive Director
The Connecticut Audubon Society*

I'm so excited! We are finally updating the Connecticut Breeding Bird Atlas! This is something I have been looking forward to ever since the early 1990s, when I first called myself a birder. At that time we were fresh off the field work for the last atlas, which was conducted between 1982 and 1986. Though I had missed out on the opportunity to participate then, the project still generated a buzz in the birding community. People still bragged about the birds they had found nesting in their "blocks," what surprises they had found right in their hometowns, and how hard they had worked to confirm X, Y, or Z species as a nester in their block.

I felt like I had missed out on a great party and I couldn't wait to participate in the next round. That leftover excitement hooked me on birds and birding. It caused me to join other citizen science efforts to practice my birding skills so I would be ready when the time came. I started participating in Summer Bird Counts, the Christmas Bird Count, the Silvio O. Conte National Fish and Wildlife Refuge Migratory Bird Study, and any other effort I could become involved in.

All of this led to my first job in the environmental field, as a field technician for the Connecticut Audubon Society, conducting bird surveys along

the coast at the Stewart B. McKinney National Wildlife Refuge.

This was a wonderful opportunity in its own right, but it also opened doors that have led to my current position as the Connecticut Audubon Society's executive director. If not for the skills I had built trying to get ready for the next atlas and the friends and connections I had made along the way, I don't know where I would be today.

It has been more than 30 years since the fieldwork was completed for Connecticut's first Breeding Bird Atlas project, but the time for a new atlas is finally here. Fieldwork will begin in 2018! So, why am I excited and why should you be? Here are my top 10 reasons.

1. An excuse to spend time in nature

Because we are all busy, getting out into the field may not be at the top of our to-do lists. Having a good reason to get out can give us an extra incentive to set that alarm clock and spend a couple of hours birding before work or before the family gets up on a weekend morning. It helps to know that our time in the field contributes not only to our own enjoyment, but to an important conservation effort.

2. Sharpen our skills

The great thing about birding is that there is always something new to learn. No matter how much you know about bird identification you can always find a challenge that sends you back to the books or recordings. Much of the atlas work relies on bird identification by sound, and there is no better way to sharpen your skills than to



PAUL J. FUSCO (2)

What could be more fun than a day in the field?

get out into the field and have a reason to identify every bird you see or hear.

3. Not all sightings are created equal

Finding a Black-throated Green Warbler or Blue-headed Vireo in migration or at a known nesting loca-



Birds like this Blue-headed Vireo can be easily recognized by song.



JULIAN HOUGH

Roseate Tern is a federally Endangered Species nesting in Connecticut only on Faulkner Island in Madison.

tion is handy for a Big Day, but finding one nesting in an unexpected place is much more thrilling. My experiences on summer bird counts in Manchester, when I was able to confirm nesting Grasshopper Sparrows on an abandoned lot and remnant populations Black-throated Green Warblers and Blue-Headed Vireo (then Solitary Vireo) nesting on Case Mountain, were much more rewarding than your typical sighting of those species.

4. It's a treasure hunt

I don't know about you, but I'm a proud lister. Perhaps it comes from my lifelong hobbies of collecting all sorts of things, but I like to complete sets. Doing a breeding bird atlas allows me to complete a virtual collection—to check off the expected birds and hope to find a rare one that will give me an even more complete checklist

5. What else we might find

One of the best things about birding is the potential for finding other wonders of nature along the way: wildflowers, dragonflies, butterflies, maybe even a bobcat or fisher. Being out "block-busting" for the atlas will afford you opportunities to find such wonders.

6. I also enjoy birding competitively

It can be fun to try to find more species than your friends so you can brag "my block is better than yours" or think up creative excuses as to why they had an unfair advantage.

7. It's long overdue

Generally speaking, it is good to update a breed-

ing bird atlas about every ten years. The 30 years that have passed since our previous atlas make it very hard for us to know how the bird distribution of our state has changed.

8. An opportunity to make new friends and reconnect with old ones

Atlases are typically a team effort, either in the planning, the searching, or the confirmation of unusual records. I have met so many great friends over the years through birding in teams for the World Series of Birding, bird surveys, big days, and Christmas Bird Counts. Seeing or hearing great birds is fun in its own right, but getting out with friends or connecting with new ones is even better!

9. An opportunity to foster the next generation

Atlas efforts are a great opportunity to foster new birders and teach them birding skills. Since many of today's birding leaders of the last atlas have fostered my own skills, I'm really looking forward to seeing the next generation get to know the more experienced birders of the state, learn about the distribution of birds in their hometowns, and be inspired to become even better birders. I'm hoping I can lead some birding-by-ear seminars to pass along the skills I've honed over decades of citizen science efforts.

10. The results are important

This atlas is something I've been talking about for more than a decade, and most of all I'm looking forward to contributing to the results. The new atlas will help us make better conservation decisions and justifications for protection of key parcels.

So often throughout my career in conservation



JULIAN HOUGH

Birding with friends has many rewards.

I've had to guess which species of conservation concern might benefit from a particular project to conserve land. We can do a decent job just by looking at the landcover data and surrounding landscape, but the atlas will take it to the next level. If we want to know where the Wood Thrushes or Cerulean Warblers are, we will just need to look at the maps. For many years I've looked at the Pennsylvania breeding bird atlas with envy: "Oh to have those maps for Connecticut; we would know just where we need to work to conserve the birds we know need the most help." When this project is done, we will finally know exactly which places are most important to which species and be able to make much better conservation decisions. I'm really looking forward to being a part of that effort!

* * * * *



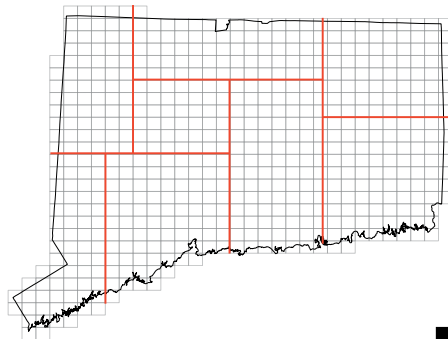
PAUL J. FUSCO

Secretive birds such as this Virginia Rail are most often located by call.

1

The CT DEEP and UConn create a map that divides the state into 596 blocks of 9 square miles each.

For consistency, the map is identical to the one used for the 1994 Atlas. The state is divided into eight regions, each with a coordinator to work with volunteers.



Atlasing Data Collection & How it Shapes Our Knowledge of Bird Distribution

2

Birders sign up for surveys in breeding season, migration period, or winter, and are assigned blocks based on their preferences.

Each birder begins field work in spring 2018.



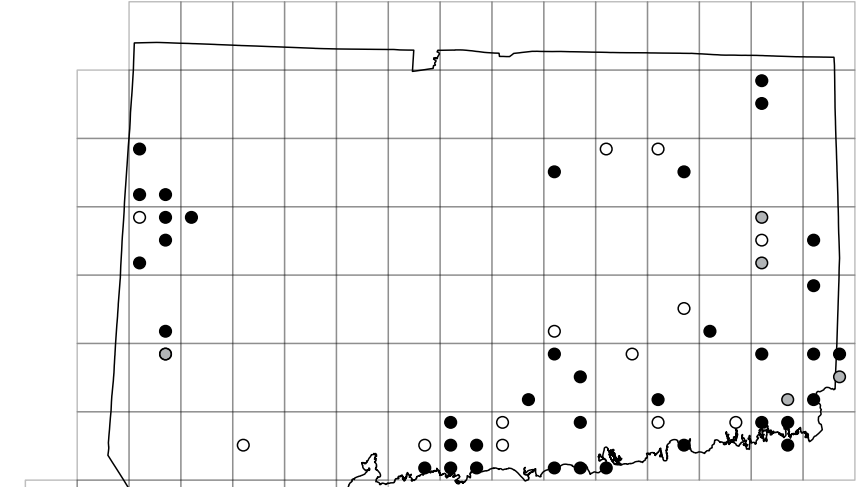
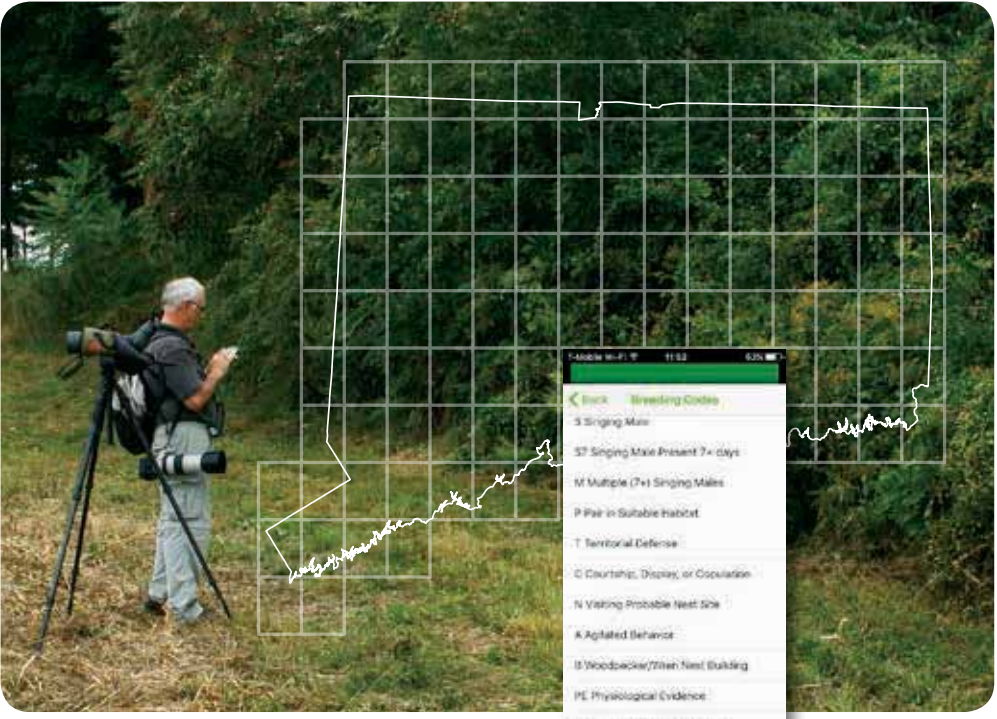
4

Data are sent back to the Atlas team at UConn for entry.

Barn Swallow	CO	DN	4/1/1	Pine Warbler	PO	X	17Jun
Cliff Swallow				Prairie Warbler			
Purple Martin				Ovenbird	PR	T	4/1/1
Blue Jay	PO	X	17Jun	Northern Waterthrush			
American Crow	PO	X	17Jun	Louisiana Waterthrush			
Fish Crow				Common Yellowthroat	PO	X	17Jun
Black-capped Chickadee	CO	FL	4/1/1	Yellow-breasted Chat*			
Tufted titmouse	CO	AY	17Jun	Hooded Warbler			
White-breasted Nuthatch	CO	FL	4/1/1	Canada Warbler			
Red-breasted Nuthatch				American Redstart	PR	P	17Jun
Brown Creeper				Bobolink			
House Wren	CO	AY	4/1/1	Eastern Meadowlark*			
Winter Wren				Red-winged Blackbird	CO	AY	4/1/1
Carolina Wren				Orchard Oriole			
Marsh Wren				Baltimore Oriole	PO	X	17Jun
Northern Mockingbird				Rusty Blackbird			
Gray Catbird	CO	AY	17Jun	Common Grackle	CO	AY	4/1/1
Brown Thrasher				Brown-headed Cowbird	CO	FL	17Jun
American Robin	CO	AY	4/1/1	Scarlet Tanager	CO	AY	4/1/1
Wood Thrush	PO	X	17Jun	Northern Cardinal	PR	A	4/1/1
Hermit Thrush				Rose-breasted Grosbeak	CO	AY	17Jun
Veery	PO	X	4/1/1	Indigo Bunting	PO	X	17Jun
Eastern Bluebird	CO	AY	4/1/1	Evening Grosbeak*			
Blue-gray Gnatcatcher	PO	X		Purple Finch			
Golden-crowned Kinglet				House Finch	PR	P	17Jun
Cedar Waxwing	PR	P	17Jun	American Goldfinch	PR	P	4/1/1
European Starling	CO	AY	17Jun	Eastern Towhee	PR	P	4/1/1
White-eyed Vireo				House Sparrow	CO	NY	4/1/1
Yellow-throated Vireo	PR	P	17Jun	Savannah Sparrow			
Blue-headed Vireo				Grasshopper Sparrow*			

3

Birders record data on a paper form or via eBird, creating a record of all birds detected in their block on a given visit.



Purple Martin
Progne subis

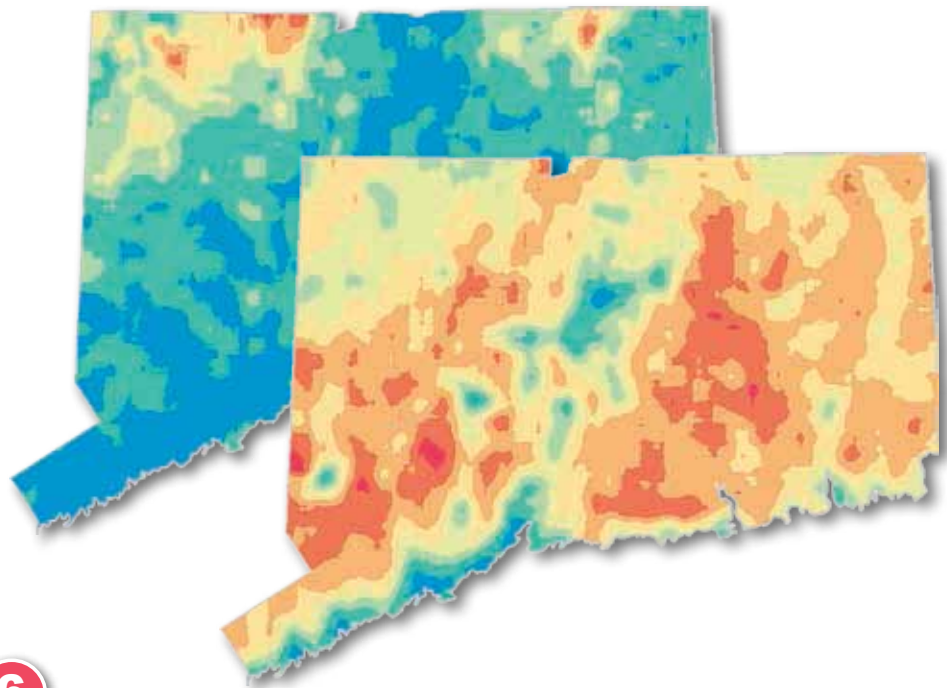
5

The Atlas team uses the data to produce a map showing which blocks each species is breeding in, with a breeding code for each.



6

Because the maps will show only whether a species is breeding in a particular block, and not how many pairs are breeding in that block, the Atlas team will also generate maps showing how the abundance of each species varies across the state and how land cover features affect those patterns.



ALL PHOTOS (JULIAN HOUGH) Except Red-tailed Hawk & Purple Martin (PAUL J. FUSCO)

Predictive Maps & Checklists courtesy of Department of Ecology and Evolutionary Biology

Volunteering for the First Atlas

“The joys that come from serious observation”

Stephen P. Broker

President

Connecticut Ornithological Association



“Connecticut is about to begin its atlas project. It is a large-scale effort to survey the state over a five-year period to discover which birds breed in the state and where they nest. It is a wonderful opportunity for birders, young and old, experienced and inexperienced, to contribute to a major scientific work. Hundreds of citizens will be able to survey the state for breeding birds and to map their distribution.”

When I read those words, published in *The Handbook of the Connecticut Breeding Bird Atlas 1982-1986*, I had an undergraduate degree in biology, a graduate degree in education, and about 10 years of teaching high school physical and life science on my re-

sume. My interest in birds had begun when I accepted a position with the public education department at Yale Peabody Museum of Natural History. There I met Tony Bledsoe, who was working on his doctoral degree in ornithology at Yale and who would become my mentor in the study of birds.

When I enrolled in a master's program at Yale School of Forestry & Environmental Studies and took courses in ornithology, ecology, and wildlife biology, my circle of mentors expanded to include Yale Peabody's Fred Sibley, Dave Parsons, and Jeff Spendelow, who went on to become contributing authors of *The Atlas of Breeding Birds of Connecticut*, the 1994 publication that resulted from the five-year atlas project. In 1984, af-

ter joining the Graduate Liberal Studies Program at Wesleyan University, I became friends with George Zepko, who was responsible for computerizing the atlas project's field data. I was most fortunate to be guided by these experienced birders at Yale and Wesleyan as we all participated in this important survey.

For my part in the survey, I decided to focus on West Rock Ridge State Park, the southern terminus of which I could see from my backyard in New Haven. A seven-mile-long, north-south-trending trap rock ridge in Connecticut's central valley lowlands, West Rock Ridge is a biogeographical island in a sea of urban and suburban development. I felt that insufficient attention might have been

given to this area, and that by concentrating on it I might be able to make a significant contribution to documenting its breeding birds. I adhered to atlas protocols, gathering evidence of possible, probable, and confirmed breeding of these species using the Atlas Handbook's breeding criteria codes, summarizing the results of each calendar year on printed field cards, and turning them over to my atlas regional coordinator, Ray Schwartz.

The atlas project made use of 117 topographic quadrangle maps covering the State of Connecticut, each map divided into six atlas blocks, designated A through F. Participants surveyed a total of 596 atlas blocks during the five-year period. My study site, West Rock, was designated as Block 95A on the New Haven Topo Map.

West Rock has an important diversity of habitats, including ridge top, gradual east-facing and precipitous west-facing slopes with talus boulders, and surrounding river and lake environments. These are distributed over more than 1,700 acres. West Rock Ridge is the second largest of Connecticut's state parks, so there was much territory to cover. Its



Peregrine Falcons first nested in West Rock Park in 2000.

features include the West River and its artificial impoundments of Konold's Pond, Lake Dawson, and Lake Watrous in lowlands to the west; Wintergreen Brook and its impounded Lake Wintergreen to the east; several large patches of grassland on either side of the ridge; and Wintergreen Notch, below which the West Rock Tunnels and Route 15 pass.

The seven miles of uninterrupted oak-hickory forest dominating the ridge are exceptional for deep-forest-nesting birds. Baldwin

Drive, a paved road that runs the length of the ridge, divides it into a narrow band on the west side leading to a 300-foot, 70-degree drop-off, and on the east to a much more gradual slope of forest, patchy grasslands, and rocky outcrops.

I devoted much atlasing time to cross country birding on the eastern slopes of the ridge. These rocky slopes have scattered regions of black birch, American beech, eastern red cedar, and mountain laurel. Here I was able to locate ground nesting birds and their nests with



Great Blue Heron nests at Konolds Pond

PHOTO BY PAUL J. FUSCO

eggs or young, and to minimize disturbance I developed a pattern of sitting on the forest floor, observing quietly. I found that warblers trading chip calls from high and low perches meant a nest was nearby, and thirty or more minutes of patience were rewarded by my discovery of Blue-winged, Black-and-white, and Worm-eating warbler nests with eggs or young. I found ground-nesting Indigo Buntings in a large patch of poison ivy at one of the ascending curves of Baldwin Drive—fortunately with no need to wade in! Nearby, I saw Eastern Towhees building a nest with eggs in leaf litter, confirmed Wood Thrush by seeing adults feeding young, and obtained probable evidence of breeding of Willow Flycatcher and Ovenbird.

Scrambling down less steep portions of the western slopes, I worked past a cliff face and spotted an Eastern Phoebe nest with young. I found pairs of nest-building Veerys and Hermit

Thrushes, and further downslope I glanced up and found an occupied Red-tailed Hawk nest, which in two months contained Great Horned Owl young. Under this tree a week or so later, I was startled to hear, then see, a newly fledged owlet snapping its bill at my feet, its wings fanned upward to enhance its size. I took photos and beat a hasty retreat to avoid parental attack.

In the lowlands, it was easy to confirm the breeding of Mute Swan, Canada Goose, Wood Duck, and Mallard on Konold's Pond and in the wooded inlet of the West River. I found numerous Red-winged Blackbird nests with eggs or young, and a Green Heron nest with young was a special find. Checking the emergent vegetation in Wintergreen Brook, I found Eastern Kingbirds tending nestlings and located Yellow Warbler and Common Yellowthroat nests with young along the shrub-covered shore.

On the ridge top, I confirmed the breeding of a number of cavity-nesting species, including Downy and Hairy woodpeckers, Northern Flicker, Great Crested Flycatcher, Black-capped Chickadee, Tufted Titmouse, and White-breasted Nuthatch. I found Mourning Dove nests with eggs in eastern red cedar trees, and I confirmed the breeding of American Crow, Carolina Wren, House Wren, American Robin, Gray Catbird, Northern Mockingbird, Brown Thrasher, Northern Cardinal, and American Goldfinch with my discovery of their nests with young. I was able to add Blue Jay to the confirmed list by finding an occupied nest, and I confirmed breeding of Rose-breasted Grosbeaks when seeing them attending their young.

As for probable breeders, I counted them when I found pairs in suitable nesting habitat or heard songs on territory a week or more apart. These included Ruffed Grouse, Black-billed Cuckoo, Pile-

ated Woodpecker, Eastern Wood-Pewee, Brown Creeper, Blue-gray Gnatcatcher, Red-eyed Vireo, Prairie Warbler, American Redstart, Scarlet Tanager, and Purple Finch.

After five years of atlasing, the results for Block 095A were 53 confirmed breeders, 32 probable breeders, and 28 possible breeders (observed during breeding, or a singing male in suitable habitat) for a total of 113 species. I'll note that others collected BBA data in Block 095A independent of me, including reporting significant records of American Kestrel, Yellow-breasted Chat, Pied-billed Grebe, and Sora. These results placed West Rock among 35 atlas blocks that achieved 100 or more species recorded, with nearly all these blocks located in northwestern Connecticut and only one other such block in southern Connecticut.

The Atlas of Breeding Birds of Connecticut summarized the five-year Atlas period of the 1980s. As Les Mehrhoff wrote in the foreword, "People should not look at this atlas as an end point but rather a beginning. I am hopeful that those involved in this project will continue to gather information." In the 30 years following completion of the atlas, I have taken his comments to heart and have continued to center my field studies on the breeding birds of West Rock. I have been able to confirm the breeding of some additional bird species, including Turkey Vulture, American Woodcock, Black-billed and Yellow-billed cuckoos, Eastern Whip-poor-will, Pileated Woodpecker, Eastern Wood-Pewee, Blue-gray Gnatcatcher, Yellow-throated and Red-eyed vireos, Prairie Warbler, Ovenbird, Hooded Warbler, Scarlet Tanager, Field Sparrow, and Orchard Oriole.

Since the early 2000s, I have enjoyed witnessing the arrival of nesting Great Blue Herons, which now form a colony of 15 nests on an island in Konold's Pond. In 1999, I found a pair of Peregrine Falcons attempting to nest at West



Great Horned Owls nested on the western slope of West Rock.

JULIAN HOUGH (2)



A nesting Green Heron was a special find.

Rock. In late March of 2000, I had the extraordinary experience of seeing the female of this pair laying a bright red egg in her nest scrape, the first peregrine egg to be laid on a Connecticut cliff in 60 years. In 2002, I found a family of Common Ravens feeding on rabbit prey high in a tree. The next year, I located the raven nest 40 feet straight down the west-facing cliffs. Breeding peregrines and ravens have dominated my field studies since these discoveries,

and in 2016 my 35 years of fieldwork were rewarded by recognition of West Rock Ridge State Park as one of Connecticut's Important Bird Areas.

Les Mehrhoff referred to "the joys that come from serious observation of our avifauna." Today's generation of birders again has that opportunity as we now begin our second Connecticut Bird Atlas.

* * * *

Wise Use of Conservation Funding Demands a Foundation of Sound Science

A Key is to Galvanize the Conservation Community

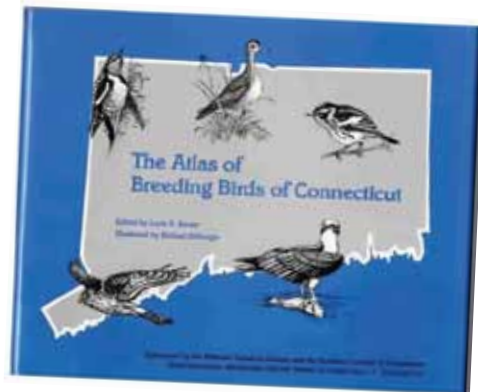
Min T. Huang

Wildlife Biologist

Connecticut Department of Energy and Environmental Protection

The first Atlas of Breeding Birds of Connecticut, published in 1994, summarized the distribution of 176 confirmed species of breeding birds in the state. In the intervening years many changes have occurred on the regional and global landscapes and in our climate. Recent survey work by the Wildlife Division of the Connecticut Department of Energy and Environmental Protection (DEEP), along with other

breeding bird survey work, indicates that historic breeding distributions have contracted for some species, such as forest interior birds, and that distributions and abundance of many other species have changed, some for the good, others for the bad. Undoubtedly many other distributional changes have occurred since the early 1980s, when data for the initial atlas were collected. These changes are illustrated by recent atlas re-



Cover of the 1994 Breeding Bird Atlas

survey projects in New York and Massachusetts. If we are to efficiently use our dwindling financial resources to conserve this beautiful resource, we must know just where our birds are and how many there may be—not only breeding birds but also those that winter here or rely on Connecticut's habitats during migration.

The Wildlife Division and the University of Connecticut are leading the effort to achieve these results by conducting a new, extensive Connecticut Bird Atlas. This multi-faceted project will focus not only on breeding and wintering birds but also, should enough financial resources become available, on

migrating birds. The project will use the best existing science and draw upon all of our conservation partners. When completed, the Connecticut Bird Atlas Project will provide:

- Contemporary data on bird distributions throughout the year to better inform land use decisions by federal, state, and municipal government; land trusts and other preservation organizations; and private landowners.
- A better understanding of the habitat needs and associations of species of greatest conservation need (known as GCN species).
- Metrics that can be used to monitor the health of the environment.
- The basis for predicting the effects of future development and climate change on individual species.

We also hope the Atlas Project will galvanize the conservation community to come together and work towards a common goal: to complete the project in three years. Although we will rely largely on volunteer birders, we will also be employing seasonal technicians to assist us in collecting more in-depth survey data than is possible solely with volunteers. We will begin collecting field data in the spring of 2018 and will continue that effort, in all seasons, through 2020.

To give one example, information gleaned from the project will help guide our forestry management practices for forest interior birds. Approximately 30 percent of all forest interior birds are currently declining. However, a decline is also detectable in over 80 percent of birds that rely on young forests. This difference creates a management quandary: how do we best serve both groups of birds? Only six percent of Connecticut's forest is classified as young forest (early succes-



PAUL J. FUSCO (2)

Atlasing will map the breeding population of Worm-eating Warbler.



The Bird Atlas will also focus on wintering birds such as this Red-breasted Nuthatch.

sional habitat), but we know that a healthy landscape should contain a minimum of around 15 percent. The DEEP has made a concerted effort to increase the amount of young forest on the landscape, largely through clearcutting. If we create more young forest, it is critical to understand how this will potentially fragment an already fragmented forested landscape. Where are the greatest concentra-

tions of forest interior birds? What habitat features are responsible for those concentrations? We likely don't want to create young forest in these areas, or if we do, let's make sure it is beneficial.

This project will tell us which critical habitat should have priority for protection. As we all know, habitat acquisition is largely an opportunistic endeavor. However, having defensible priorities en-

PAUL J. FUSCO



Ruffed Grouse populations have declined dramatically since the first atlas.



PAUL J. FUSCO

We need to understand the critical habitat of Long-eared Owl.

ables agencies and preservation organizations to work together to better protect the landscape.

How are we going to do it?

Breeding Birds

We will be investigating the distribution of our breeding birds by duplicating the initial Breeding Bird Atlas techniques for determining the presence or absence of birds during the breeding season within 596 blocks across the state. Volunteer surveyors go into their assigned blocks for a set amount of time (usually 15-20 hours) throughout the breeding season. These visits could consist of two 10-hour visits, four 5-hour visits, or whatever combination is convenient for the surveyor. All bird species observed are tallied, as are specific behavioral cues that determine whether the species is con-

firmed breeding, suspected, or just passing through.

To assess the more difficult-to-detect breeding birds we will employ specialized surveys, building upon previously conducted work. Standardized marshbird callback surveys will be used in select marshes (those with the highest probability of detecting target species). Night bird surveys will be conducted in those areas that are not already being surveyed.

For fully effective conservation planning, it isn't good enough just to know whether a species is breeding or not. We need to know how many are breeding, what habitat features make one area better than another, and how these factors might change over time. Thus, we will also conduct point-count surveys, which, if adhering to very strict protocols, will let us develop abundance estimates across the state. For many birds and for

most non-game species, these will constitute the first statewide population estimates. Abundance estimates are critical in our understanding of how birds are keying in on habitat features across the landscape. Knowledge of abundance and habitat association enables us to better prioritize where we need to focus conservation efforts if we want to recover particular species. This kind of in-depth knowledge also allows us to develop indices that we can use to help predict future breeding bird distributions as the landscape changes.

Wintering Birds

As we all know, most of our birds are migratory. We need to be able to conserve habitat for the entirety of a migratory bird's life cycle—breeding, migration, and wintering. Thus, this project will also focus attention on wintering

birds and their habitat needs and associations. Our approach towards wintering bird assemblages and distribution will be similar to the block survey approach we will use for the breeding bird component. There may be some modifications that enable us to better assess arrival times, as some arrive much earlier than others. This aspect of the project will be more of a challenge than the breeding atlas component.

Migrating Birds

The last component of the Atlas Project and likely the most difficult is migration. This also happens to be the component that is not yet fully funded. The approach that makes the most sense for identifying migrating birds and assessing the importance of our habitats for them is to use existing migratory stopover data and contemporary radar data. These, in conjunction with on-the-ground surveys, should allow us to identify critical habitat. Such data will require rigorous analysis, and that is where the funding is needed. To complete this component properly, we need to hire a post-doctoral fellow who can devote two years to the task.

Let's Get Started!

As we gear up for the kickoff of data collection in the spring of 2018, we would like to emphasize that this much-needed project doesn't depend on CT DEEP and UConn alone. It is collectively our project. The work will benefit all of us who care deeply about birds in this state. Although UConn and DEEP will be initiating and guid-



JULIAN HOUGH (2)

Sharp-shinned Hawk is a Connecticut Endangered Species. Do they still breed here?

ing it, for it to succeed fully we all need to embrace it as our own.

First and foremost, the project will require an extensive and committed volunteer birding effort. Much of this effort will be focused on individual responsibility for surveying one or more of the 596 blocks. This is no small task, but it serves as the solid foundation upon which everything the project strives to accomplish will be built. We have a coordinator, Craig Repasz, president of the New Haven Bird Club and conservation chair for the Connecticut Ornithological Association, who will be taking on the huge task of coordinating the volunteer survey effort. Prospective volunteers can become a part of this great

project by emailing to: ctbirdatlasvol@gmail.com.

The Atlas Project is a huge undertaking that will require considerable help from the birders of Connecticut. The gains in knowledge, however, will be tremendous. Once again we will be asked to go birding. It will be a great time to be a birder in Connecticut!

* * * * *



A Regional Perspective: How Do Connecticut's Breeding Bird Atlases Contribute to Bird Conservation?

Randy Dettmers
Senior Migratory Bird Biologist
U.S. Fish and Wildlife Service, Hadley, Massachusetts



Any one state's breeding bird atlas efforts can tell only a piece of the larger story of the status and ecology of bird populations. Yet each state's piece is critically important. When stitched together, the combined information from state-level breeding bird atlases gives us a comprehensive pic-

ture of a number of critical descriptors of the status of bird populations as well as each individual species breeding in that region.

Without each state's contribution, our understanding of the larger picture would be incomplete, like an x-ray with a hole in the middle or the edge, and

less valuable to bird conservation efforts. New England, for example, is on the northeastern edge of the breeding range of Cerulean Warbler, a species of high conservation concern. Ceruleans are known to breed in scattered locations in the region; but without each state's breeding bird atlas information, we would be left with a hole in our understanding of the current breeding distribution, relative occurrence, and where (or even whether) to target conservation efforts.

Connecticut likely supports the largest (but still relatively small) population of Cerulean Warblers in New England, with recent atlas efforts from Vermont and Massachusetts showing only a handful of occupied blocks each. The results of the upcoming Connecticut atlas effort will tell us if Ceruleans have gained more of a stronghold in the state and where efforts to protect large blocks of mature forest and limit fragmentation will most benefit them.

In addition to filling those holes in the regional picture, state breeding bird atlases provide other valuable information.

Breeding Distribution

Most breeding bird atlases cover their states through blocks that are approximately five kilometers (3.1 miles) on each side, thus providing the most complete and finest-scale depiction of observed bird distributions of any bird monitoring effort in this country.

Timing and Length of the Breeding Season

Data on breeding status throughout the years of each atlas effort provide a snapshot of the timing and length of the breeding season for each species in each state. These data represent a wealth of knowledge about the breeding biology of species and how the timing and length of the breeding season might be changing over time in



Red-bellied Woodpeckers are expected to be found in many atlas blocks.

response to environmental factors such as changing temperatures or precipitation patterns.

Relative Abundance

At a minimum, breeding bird atlases provide a coarse sense of relative bird abundance through the percentage of occupied atlas blocks in a state. In some states, such as Pennsylvania, point count surveys are also being incorporated into the atlas methods, providing a more robust estimate of relative abundance for many species.



Hooded Mergansers are one of the species not well covered by other monitoring programs.

It's not the Breeding Bird Survey!

Breeding bird atlases provide a valuable complement to other sources of information on the status of bird populations. While the North American Breeding Bird Survey is well suited to tracking long-term breeding bird population trends through annual point count surveys, it is not designed to confirm breeding activities or document breeding distribution or timing at the finer resolution that breeding bird atlases provide. Each state atlas therefore plays an important role in our overall understanding of the distribution and breeding ecology of our bird community.

This information is especially important for several groups of species that are not covered well by the Breeding Bird Survey or other monitoring programs. These include species not abundant during the breeding season (American Bittern and Hooded Merganser, for example); species found only in specific locations or habitats (Willet, Acadian Flycatcher, Black-crowned Night-Heron); species that are difficult to detect with point count surveys (owls, nightjars, secretive marsh birds); and species at the edge of their breeding range for which that edge can change over time and across state boundaries. For species that are difficult to detect, such as the Northern Saw-whet Owl, some recent atlas efforts (Pennsylvania, Ontario) have asked observers to use a nocturnal owl survey to better capture their occurrence.

One example of a species whose range is changing is the Red-bellied Woodpecker. During the first atlases in southern New England, this bird was fairly common in Connecticut, occurring in about 30 percent of the atlas blocks. But it was found in only four

atlas blocks each in Rhode Island and Massachusetts. Today, Red-bellied Woodpeckers are widely distributed across all three states and are expected to be found in a very high percentage of blocks during Connecticut's second atlas. Even in Vermont, which did not detect them during its first atlas, Red-bellied Woodpeckers were found in more than 30 priority blocks during its second atlas, clearly illustrating the northward and eastward expansion of this species' during the past 20-30 years.

Without the combined power of state atlases, we would have a considerably poorer regional understanding of the current breeding status and distribution of these types of

species, as well as changes over time. When other information is lacking, bird atlases that have been repeated over time provide a rough but very valuable indication of population change, without which the bird conservation community might be left guessing about their status and trends.

Informing Bird Conservation: assessing species vulnerability, stewardship responsibility, and response to threats

Ultimately, state atlases contribute to bird conservation at larger scales through avenues such as regional and continental species vulnerability assessments, which aid in identifying species most in need of conservation. State atlases contribute invaluable information for developing relative assessments of breeding range size, abundance, and population change across all species. These contribute to our understanding of which species are most vulnerable to population declines or extirpations at regional scales. Such vulnerability assessments can serve as early warning bells for species that might still be relatively common but are in decline and in need of conservation attention, as well as highlighting the truly rare and threatened species most need of conservation action. In a larger regional context, each state's bird atlases, when compared to those of their neighbors, help define that state's role in sustaining healthy regional populations of such species.

A good example is Eastern Whip-poor-will. Comprehensive monitoring data were lacking because Breeding Bird Surveys (that is, point counts), which are conducted during the day, almost always over-

look whip-poor-wills, which sing at night, and efforts to establish a regional monitoring program for nightjars have not proved sustainable. But since breeding bird atlases have documented declines from first to second atlases, Eastern Whip-poor-will is now identified as a Species of Greatest Conservation Need by all the northeastern states.

The second generation of bird atlases also provides a snapshot of where whip-poor-will breeding populations can still be found, and the relative contribution each state makes to the total population. In Connecticut, breeding Eastern Whip-poor-wills are still expected to be found at scattered locations but are likely to show a decline from the 17 percent block occupancy observed in the first atlas. Other northeastern states, including Pennsylvania, Massachusetts, and Vermont, have observed a decline of about 50 percent in block occupancy of whip-poor-wills between their first and second atlases. This information indicates that all states in the region are experiencing similar declines and that they all have a shared role in helping to maintain a sustainable regional population of this species.

The information from state bird atlases across a region helps us understand how different species are responding to potential drivers of population change by documenting changes in breeding distributions, timing of the breeding seasons, and relative population change. When these data are paired with data on changes in environmental factors, patterns can emerge that help the bird conservation community understand what might be causing the changes. Some examples:

Land Use Change

As New England's forests have grown older and its suburbs and exurbs have expanded, birds that rely on young forests and shrublands, such as Eastern Towhee, Field Sparrow, Blue-winged Warbler, and Prairie Warbler, have declined. Meanwhile, that same forest maturation and expansion in southern New England have contributed to increases of species such as Red-eyed Vireo, Winter Wren, and Black-throated Green Warbler.

Climate Change

Patterns of northward expansion of southern species suggest a warming climate might be contributing to the increased occurrence of Acadian Flycatcher, Carolina Wren, and Hooded Warbler throughout southern New England. In Massachusetts, where these birds occurred in only a few blocks during the first atlas, the number of blocks occupied during the second atlas was 10, 11, and 6 times greater for these species, respectively. In Connecticut, where

these species already occupied between 10 and 30 percent of blocks during the first atlas, we also might expect large increases. Any indications of changes in the onset of nesting activity over time could also be indicators of species' responses to changing climate.

Change due to other stressors such as contaminants, invasive species, or disease

Troubling declines of aerial insectivores across several taxonomic groups, including nightjars and swallows, may indicate that the insects they eat are declining, perhaps because of pesticide use. More positively, recovery of fish-eating birds such as Bald Eagle, Osprey, and Double-crested Cormorant demonstrate the success of efforts to rid our environment of contaminants such as DDT.

When patterns such as these emerge at larger regional scales, they help build interest and effort within the entire bird conservation community toward addressing the underlying causes and finding solutions to negative impacts on the birds we all care so much about. Each state breeding bird atlas makes a unique contribution to this larger regional picture and is valuable in its own right. But when cumulative information is combined, we learn more about what is happening to our bird populations and potentially some of the causes behind changes. That information from the larger scale, in turn, comes back to help each state understand how it fits into the bigger picture and what role it plays in helping to maintain sustainable bird populations for the long term.

* * * * *



How Breeding Bird Atlases Can Lead to Conservation Improvements

Daniel Brauning
Wildlife Diversity Chief
Pennsylvania Game Commission

Breeding bird atlas projects have become well-established tools in the field of bird monitoring and can play a valuable role in helping states find and correct environmental problems and make conservation decisions. Atlases are comprehensive and exhaustive. They engage a broad spectrum of the birding community in the work of documenting the distribution of all breeding bird species uniformly across a particular state during a defined period. They establish a benchmark for the status, range, and in some cases density of breeding birds.

When a second generation of atlases is completed, as happened recently in Pennsylvania, the data can show changes over time and can serve as the raw material for conservation decisions. A second atlas complements the first, giving decision makers more information for prioritizing bird conservation efforts.

Because we know a great deal about bird habitat requirements and population trends, birds can be tremendous indicators of environmental health. Changes in bird populations can point us to serious problems. Perhaps the most dramatic and familiar examples are the decimation of the Osprey and Peregrine Falcon populations in the 1950s and 1960s, which led to a ban on the pesticide DDT. Atlas data can help identify similar broad-scale environmental crises, as well as local problems. And

they can indicate harder-to-measure environmental conditions, such as the effects of climate change.

Atlas data can show that a species is more or less common now than, say, 30 years ago, leading to revisions in the classification of endangered and threatened species. Atlases can provide a quantitative foundation for determining state “Species of Greatest Conservation Need” for the state’s Wildlife Action Plan and other conservation prioritizations. The comprehensive and systematic nature of bird atlases, unlike many other broad-based bird surveys, ensures that this basic information is obtained for all species.

An atlas can document that a species is recovering from a population decline, supporting an upgrade in conservation category or removal from the endangered or threatened list. Pennsylvania’s first breeding bird atlas, conducted during the 1980s, when large survey efforts and big data were novel, radically changed our perspective of species priorities. We learned that species such as Grasshopper Sparrow, which we thought were at risk, were still widespread, although declining. Likewise, the Northern Harrier map demonstrated a severe reduction in its breeding range, and we saw that Cooper’s Hawk and Eastern Bluebird were no longer vulnerable. The atlas also allowed us to clarify the status of birds previously con-



Grasshopper Sparrow
PHOTO BY JULIAN HOUGH

sidered to be of “undetermined status,” including whip-poor-will, Yellow-bellied Sapsucker, and Least Flycatcher. One result was a major revision of the state’s official endangered and threatened bird list, built for the first time on the best available data, not the best available anecdotes.



A reclaimed strip mine provides grassland habitat in Pennsylvania.
PHOTO BY PAUL J. FUSCO

For population changes of the most common species, the U.S. Geological Survey’s Breeding Bird Survey continues to be the most robust documentation at the scale of a bio-region or state. But atlases are good at finding rare breeding species that might otherwise be missed, helping us assess the status of birds that don’t sing, or are not otherwise readily visible—owls and wetland birds, for example.

Atlases also typically collect details that support protection of rare species when they occur in widespread locations rather than as part of a larger cluster. The local site conditions of rare species provided hundreds of such locations to Pennsylvania’s Heritage Program. The efforts of dozens of atlas volunteers led to far more protection of these rare species than would have been possible with only a paid staff.

Beyond rare species, atlas data reveal geographic areas inhabited by species of concern that we might not otherwise have seen. For instance, the decline of one Watch List species, Cerulean Warbler, is of great concern to conservation biologists regionally. Pennsylvania’s second atlas documented its widening distribution along hundreds of miles of riparian and ridgetop forests in eastern Pennsylvania. Similarly, Golden-winged Warbler conservation was defined around population clusters found by atlas volunteers.

We were then able to proactively manage the forests the atlas identified on public lands, while using funds from the Farm Bill (via the Natural Resource Conservation Service) on private property. This effort spawned the need for foresters, whose careers were inaugurated by establishing for-

est conditions for Golden-winged and Cerulean warblers. Since bird distributions are always changing, atlas results continue to point to the locations that will be most productive in restoring, or promoting, populations in decline. Because we have learned which management actions have worked for these species and where initiatives might be most profitable, we can avoid expensive management activities where success is not likely.

The abundance survey conducted as part of the second Pennsylvania breeding bird atlas generated a massive set of standardized point counts that have proved a rich source of conservation value. Designed to take our understanding of distribution to another dimension, this network of 36,000 points was used to compute the density of more than half of Pennsylvania’s breeding birds. Presence data



HAL KORBER / PGC

Pennsylvania's second atlas mapped hundreds of miles of ridgetop forests.



Golden-winged Warbler
PHOTO BY PAUL J. FUSCO

indicate the extent of a species' distribution, but density enables us to think about populations. We were able to map areas that supported the highest concentrations of single species, or a group of species such as a suite of forest-interior birds. Identifying core population areas helps managers focus their efforts, providing a justification for conservation action even for widespread and relatively common species.

The richness of atlas data has given us information about what happens to bird populations when landscape features or climate change. These models have improved our ability to plan bird conservation activities in the future, allowing us to take advantage of conservation opportunities based on a realistic understanding of how birds respond to various stressors and human-derived changes in ecosystems. Population estimates from the point count data, or even from the tens of thousands of spe-

cific locations provided by volunteers, allow conservation planners to better understand the state's role in stewardship of each species and in future conservation initiatives. Even more appropriately, we will be able to use these estimates to better plan where our opportunities for conservation can be most profitable.

With the broad engagement by the birding community that atlases require, these projects also build the community of conservation-minded participants. Atlasing readily incorporates contributions from birders with a wide range of skills, and their participation connects them to the conservation of the birds they observe. This network—an established constituency for bird protection—can be counted on to support and assist in a range of conservation actions well into the future.

* * * *

About The Authors



MILAN G. BULL

MILAN G. BULL is senior director of science and conservation for the Connecticut Audubon Society. He has a B.S. degree in wildlife management from the University of Connecticut and a M.S. degree in biology from the University of Bridgeport. He is a member of the Citizens Advisory Council to Connecticut's Department of Energy and Environmental Protection, and was a founding director and past president of the Connecticut Ornithological Association.

ROB KLEE is the commissioner of Connecticut's Department of Energy and Environmental Protection. Before joining state service, he was an attorney with Wiggin and Dana LLP, in New Haven, where he specialized in appellate work and energy and environmental law. Commissioner Klee holds a Ph.D. from Yale's School of Forestry & Environmental Studies in industrial ecology, a law degree from Yale, and an undergraduate degree from Princeton in geology and environmental science.



ROB KLEE

PATRICK COMINS is executive director of the Connecticut Audubon Society. He is a graduate of Trinity College and has worked in bird conservation for over 20 years. Patrick served as director of bird conservation for Audubon Connecticut for nearly 17 years. He is a past president of the Connecticut Ornithological Association. Patrick is a member of the Connecticut Forest Practices Advisory Board and a founding member and past chair of the Friends of the Silvio O. Conte National Fish and Wildlife Refuge.

CHRIS ELPHICK is an assistant professor at the University of Connecticut. He earned his Ph.D from the University of Nevada for work on the conservation benefits of managing California's rice fields for wetland birds. His work focuses on the conservation ecology of birds, especially in wetland and agricultural settings. Recently, he has worked on the population dynamics and management of endangered waterbirds, and on the ecology and conservation of saltmarsh nesting birds. His work on Saltmarsh Sparrows earned a 2004 National Investigators Award by Partners in Flight. He was a co-editor of the Sibley Guide to Bird Life & Behavior.



PATRICK COMINS

MIN HUANG is a wildlife biologist for the Connecticut Department of Energy and Environmental Protection and heads its Migratory Bird Program. Min received his Ph.D. from the University of Connecticut, researching sub-population structure and survival of resident Canada Geese. He has worked as a wildlife biologist for the Florida Fish and Wildlife Conservation Commission, where he managed a wildlife management area, working primarily with deer and various endangered species such as Florida Scrub Jay and Whooping Crane.

STEVE BROKER earned a B.A. and M.A.T. from Wesleyan University and an M.F.S. from the Yale School of Forestry and Environmental Studies. He taught science for 25 years in the New Haven Public Schools. Steve is president of the Connecticut Ornithological Association and past-president of the New Haven Bird Club. He has analyzed and written about the results of 33 Connecticut Christmas Bird Counts for The Connecticut Warbler. Steve devoted more than 500 hours of fieldwork on Outer Cape Cod for the Massachusetts Breeding Bird Atlas II.

RANDY DETTMERS is a senior migratory bird biologist with the U.S. Fish and Wildlife Service's Division of Migratory Birds, in Hadley, Mass. He earned a B.S. in zoology from the University of Wisconsin-Madison and M.S. and Ph.D. in zoology from Ohio State. Randy's work focuses on the status of non-game bird populations, identifying species most in need of conservation, and developing and implementing conservation plans for those species of conservation concern.

DAN BRAUNING started his career as project coordinator of the first Atlas of Breeding Birds in Pennsylvania. He joined the Pennsylvania Game Commission as ornithologist in 1990, and now juggles a range of bird and mammal research and management issues as the supervisor of the Wildlife Diversity Program. He co-authored The Birds of Pennsylvania in 1992. He served as director and co-editor of the Second Pennsylvania Breeding Bird Atlas, in 2012.



STEPHEN P. BROKER



MIN HUANG



RANDY DETTMERS



DAN BRAUNING

CONNECTICUT AUDUBON SOCIETY

The Connecticut Audubon Society, founded in 1898, conserves Connecticut's environment through science-based education and advocacy focused on the state's birds and their habitats. We have centers in Fairfield, Milford, Glastonbury, Pomfret, Old Lyme, and Sherman; historic sites in Fairfield (Birdcraft Sanctuary) and Hampton (Trail Wood); and an EcoTravel office in Essex. We manage 20 wildlife sanctuaries covering 3,300 acres. Our programs, including Science in Nature, educate 200,000 adults and children each year.

Board of Directors 2017 - 2018

Peter Kunkel, Chair
 Kathleen Van Der Aue, Vice Chair
 Ralph Wood, Treasurer, Chair Emeritus
 Charles Stebbins, Secretary
 Patrick Comins, Executive Director

Michael Aurelia
 James G. Denham
 Pamela Fraser-Abder
 Samuel Gilliland Jr.
 Patrick J. Lynch
 Jerid O'Connell
 Jeanne Olivier
 Judith F. Richardson
 Landon Storrs
 Benjamin Williams

www.ctaudubon.org

Centers

BIRDCRAFT / MAIN OFFICES
 314 Unquowa Road, Fairfield, CT 06824
 203-259-0416

CENTER AT MILFORD POINT
 1 Milford Point Road, Milford, CT 06460
 203-878-7440
 Director: Rick Boucher

CENTER AT FAIRFIELD
 2325 Burr Street, Fairfield, CT 06824
 203-259-6305, ext. 109
 Director: Rick Boucher

CENTER AT GLASTONBURY
 1361 Main Street
 Glastonbury, CT 06033-3105
 860-633-8402
 Interim Director: Michelle Eckman

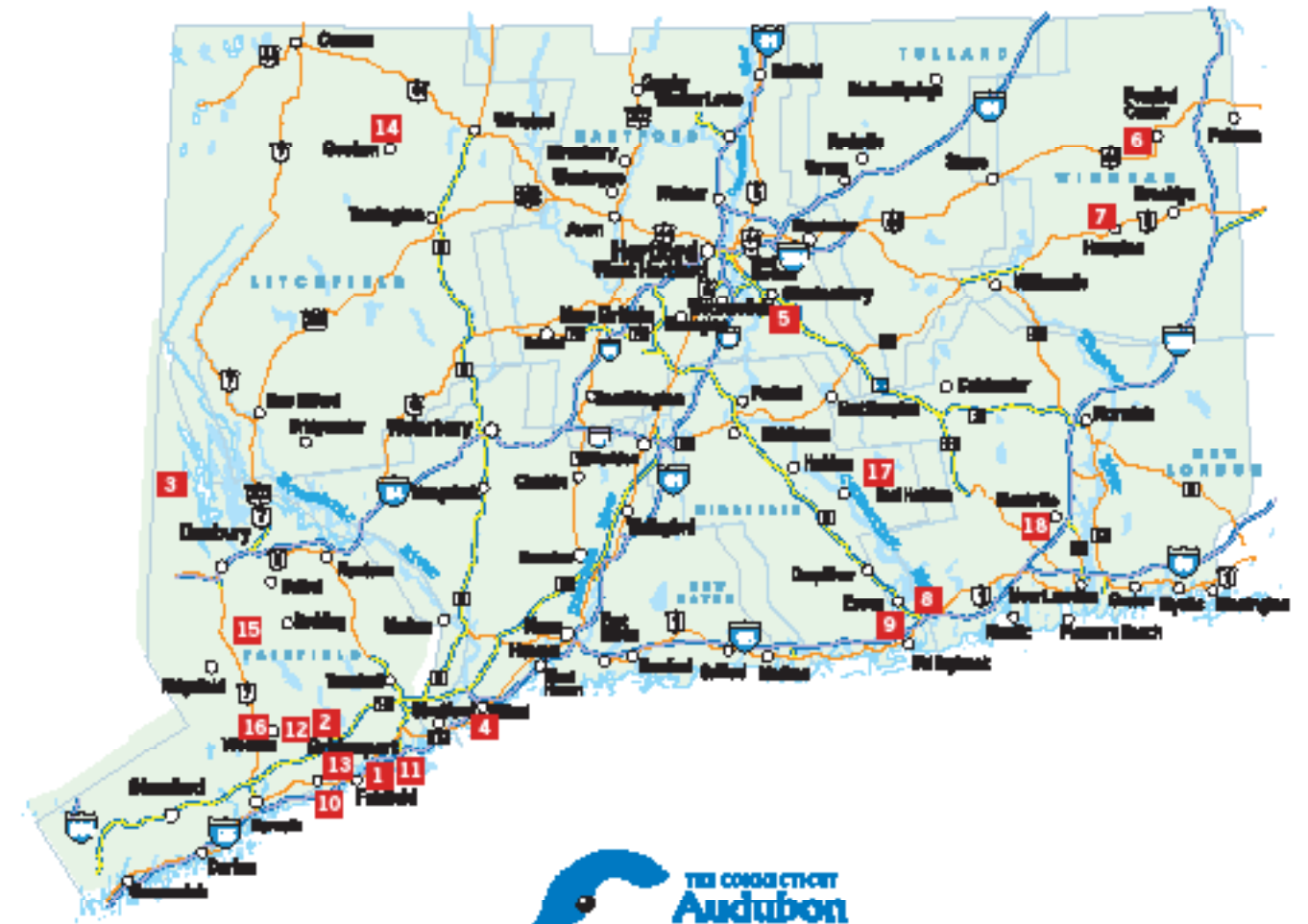
CENTER AT POMFRET
 218 Day Road
 Pomfret Center, CT 06259
 860-928-4948
 Director: Sarah Heminway

DEER POND FARM
 Wakeman Hill Road, Sherman, CT 06874
 860-799-4074 x105
 Director: Cathy Hagadorn

TRAIL WOOD
 93 Kenyon Road, Hampton, CT 06247
 860-928-4948
 Director: Sarah Heminway

ROGER TORY PETERSON ESTUARY CENTER
 PO Box 62, 90 Halls Road
 Old Lyme, CT 06371 860-598-4218
 Director: Eleanor Robinson

ECOTRAVEL
 30 Plains Rd., PO Box 903, Essex, CT 06426
 860-767-0660 800-996-8747
 Director: Andrew Griswold



Our Centers and Sanctuaries

- 1** Birdcraft, 314 Unquowa Road, Fairfield. Connecticut Audubon's state office & a 8-acre sanctuary.
- 2** The Center at Fairfield & Laven Sanctuary, 2325 Burr Street, Fairfield, 105-acre sanctuary.
- 3** Deer Pond Farm, Wakeman Hill Road, Sherman, 600-acre sanctuary open only by reservation or appointment.
- 4** The Coastal Center at Milford Point, 1 Milford Point Road, Milford, 4-acre Smith-Hubbell sanctuary, access to Long Island Sound & tidal marsh.
- 5** The Center at Glastonbury, 1361 Main Street, Glastonbury, Adjacent to Erie Park.
- 6** The Center at Pomfret & Ballin Sanctuary, 218 Day Road, Pomfret Center, Adjacent to the 700-acre Ballin Sanctuary.
- 7** Trail Wood/The Edwin Way Teale Memorial Sanctuary, 93 Kenyon Road, Hampton, 100-acre former home of writer-naturalist Edwin Way Teale.
- 8** The Roger Tory Peterson Estuary Center, 90 Halls Road, Old Lyme (office only).
- 9** EcoTravel, 30 Plains Road, PO Box 903, Essex, 06426
- 10** H. Smith Richardson Wildlife Preserve and Christmas Tree Farm, Saco Creek Road, Westport, 78 acres
- 11** Hope Woodor Thiel Marsh & H. E. Sargent Sanctuary, Fairfield Beach Road, Fairfield, Salt marsh.
- 12** Banks Smith Farm, Merwin Lane, Fairfield, 60 acres.
- 13** John W. Pahl & John Hathaway Sanctuary, Old Academy Road, Fairfield, 14 acres.
- 14** Richard H. Drott Memorial Preserve, East North Street, Goshen, 700 acres.
- 15** Edmund Stincham Memorial Wildlife Preserve, Chestnut Woods Road, Rocking, 54 acres, primarily wetlands.
- 16** Bruce Robinson Nature Sanctuary, Lewis Highway, Weston, 57 acres.
- 17** Maria H. Hargraves Preserve, Creek Row, Healden, 65 acres.
- 18** Morgan E. Clarys Preserve, Turner Road, Montville, 230 acres.

For more details or directions, please visit www.ctaudubon.org



314 Unquowa Road, Fairfield, CT 06824

