**NATIONAL AUDUBON SOCIETY** **November 2016**

# Summary report on Audubon's June Climate Watch pilot

*Thanks to you breeding season trendsetters, we are doing important work for birds!*

Photo: Eastern Bluebird. John Larson/Audubon Photography Awards

Audubon

## Summary

The June 2016 pilot survey was the first breeding season survey for Audubon's Climate Watch program. Climate Watch is a citizen science effort that integrates species climate projections with community volunteers' local knowledge to learn how birds will respond to climate change. In this report, we highlight the survey and participants, key feedback, and report on initial findings from the data that were collected. We found that the Western and Mountain bluebird may already be tracking climate change, however the Eastern Bluebird may be lagging behind and not moving into newly suitable areas. In addition, we found that nest boxes appear to be beneficial for the Eastern Bluebird, but not the other bluebird species. Feedback from participants also highlighted the need for earlier notice of program dates, more mapping coverage of bird range projections, and improved support for the survey protocol. We have integrated these into the 2017 survey, and we have also provided improved climate change models and added an additional target group species-nuthatches. We are thankful for all of your work on the Climate Watch program, which will help us unveil a more complete picture of how birds are responding to climate change.

## Climate Watch June pilot overview

From June 1-15, 2016, more than 130 dedicated volunteers from nine Audubon chapters and one Audubon center traversed fields across the U.S. to look for Eastern, Western, and Mountain bluebirds in the second pilot of Audubon's Climate Watch. We thank everyone who took the time to participate in this effort to test Audubon's climate model predictions of future bird ranges. These chapter and center territories contain key areas where Audubon's climate models predict the bluebirds will gain, lose, or maintain stable breeding range over the next 15 years and beyond due to climate change.

The chapters and center that piloted the first breeding count period for Climate Watch are:

Atlanta Audubon Society, GA
Audubon Society of Corvallis, OR
Coastal Georgia Audubon Society, GA
Chesapeake Audubon Society, MD
Pickering Creek Audubon Center, MD
Prairie Rapids Audubon Society, IA
Tucson Audubon Society, AZ
Audubon Society of Greater Denver, CO
Snake River Audubon Society, ID
Central New Mexico Audubon Society, NM
East Cascades Audubon Society, OR

## Planning the first breeding season Climate Watch surveys

Chapter leads recruited, trained, and coordinated volunteers to cover selected survey squares in each chapter territory. Working with the national science and network teams, they raised and helped answer insightful questions about planning bluebird survey locations and guided the development of resources for volunteers and revisions to the protocol.

The Climate Watch protocol for the breeding season is the same as for winter and involves completing a series of 12 five-minute point counts within one or more 10 x 10 km survey square. Conducting multiple point counts within each survey square is essential, as is conducting surveys in squares with a variety of predictions for how the birds will respond to changing climate. For areas of predicated stasis (values near zero) the surveys enable us to determine the detectability of bluebirds. Surveys in areas of predicted gain (positive values) or loss (negative values) will ultimately allow us to determine whether and where bluebird breeding ranges are changing. A critical aspect of Climate Watch is that volunteers go into areas where bluebirds are not currently expected but might show up in coming years in order to identify range expansion when it occurs. It's just as important for us to know where bluebirds *are absent* as it is to know where they are already present.

## Climate Watch June pilot results

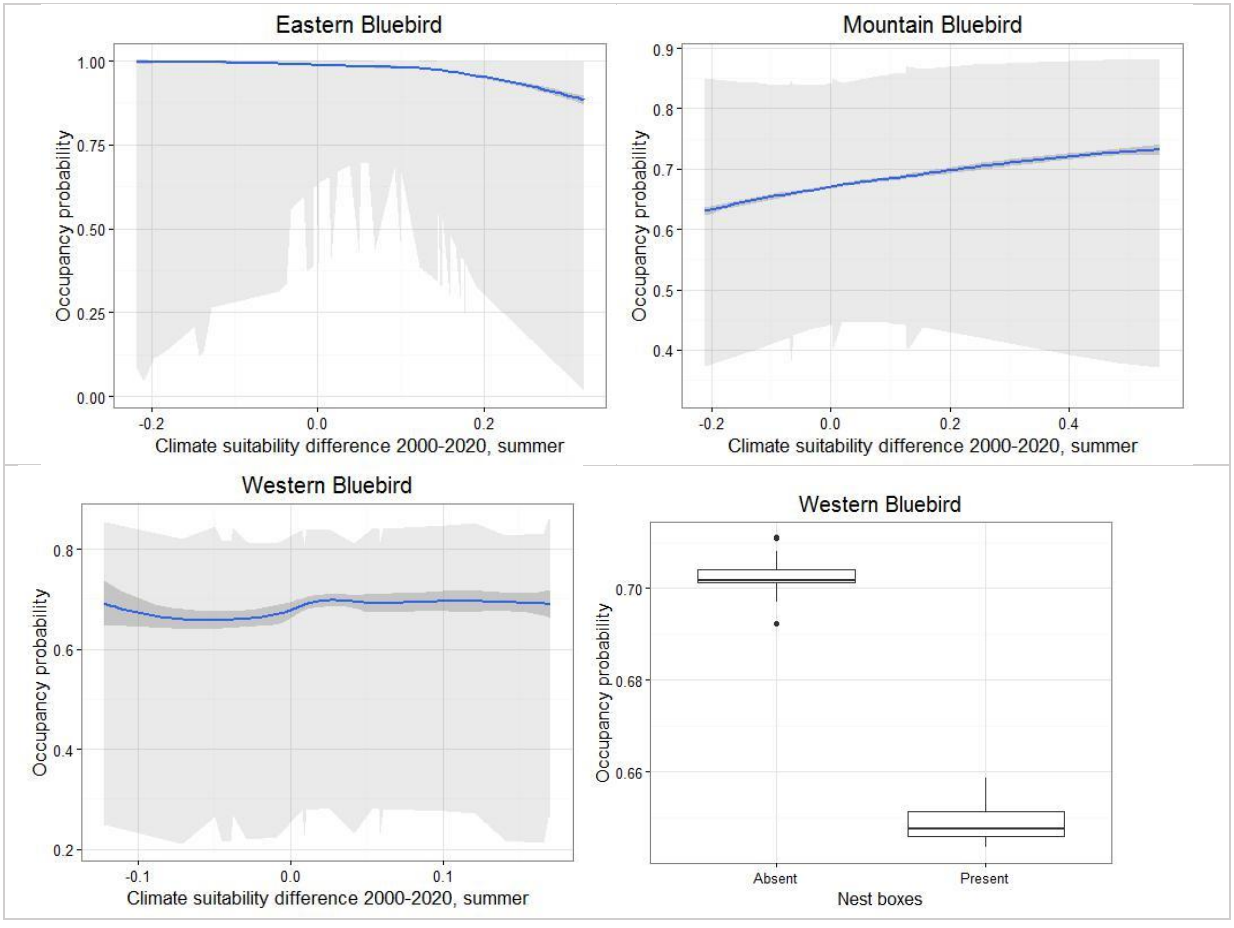
Chapter coordinators and participants spent quite a bit of time planning and conducting these surveys. Using a variety of tools, coordinators researched and scouted areas to locate breeding habitat for bluebirds and to assign good survey locations for volunteers. Finding suitable habitat as well as accessible survey locations that are close to volunteers and allow for parking and access does continue to require some advance planning. In addition, some planned survey locations had to be adjusted due to conditions in the field. Coordinators and participants made use of Audubon's ESRI Climate Watch planning tool as well as eBird reports and satellite maps to plan survey locations.

Coordinator orientation webinars were well attended and we hope the webinars, printed, and online resources gave everyone sufficient guidance to conduct their surveys successfully. We very much appreciate your passion for the birds and that you were willing to test out the resources and field protocol during this first breeding season pilot.

The goals of this pilot phase were to continue to test the program design, field-test the revised protocol (updated from our winter pilot), evaluate changes we implemented from the winter pilot, and learn of any new challenges that may arise when doing a field survey during the breeding season. Participants collected and reported data, and the maps displayed at the end of this report show the results of the analysis of the June 2016 pilot data for all three species of bluebird. Over time, as more data are collected during the winter and summer Climate Watch count

periods, we hope to be able to use this data to learn about how bluebird ranges are shifting in response to a changing climate.

With one summer survey season of pilot data, we were able to do a preliminary analysis looking at how bluebirds are already responding to climate change. National Audubon Society's climate models produced estimates of the predicted change in climate suitability during 2000-2020 for each grid cell that you surveyed. We analyzed the relationship between the change in suitable climate and the occupancy probability of each bluebird species. This gives us a measure of the probability that a species would occur within a grid cell. In a similar pattern to our January 2016 pilot analysis, Eastern Bluebirds appear to have a slightly (although non-significantly) negative relationship with projected change in climate suitability. This means that Eastern Bluebird occupancy probability is highest in areas with declining climate suitability. This could be because the species has not yet begun to move into areas of increasing climate suitability, and more analyses are required to determine if this species is in fact lagging behind its predicted range shifts. However, both Mountain Bluebirds and Western Bluebirds showed a slightly positive (although non-significant) relationship with change in climate suitability. This indicates that these two species may be more likely to occur in areas that are becoming more climatically suitable, suggesting that they may be tracking climate change.




Interestingly, Eastern Bluebirds were the only species to have higher probability of occurrence in grid cells containing nest boxes, with both Western and Mountain bluebirds showing slightly lower probability of occurrence in grid cells containing one or more nest boxes (only showing Western Bluebird results here). However, these patterns were all non-significant and more data are needed to determine to what extent these patterns hold true. There is some evidence that bluebirds and tree swallows may compete for nest boxes, although at this point we do not have the data to test this theory with Climate Watch data. With your help collecting this valuable data, and with

additional data for both the January and June survey periods as we move forward through time, we can learn more about how bluebirds and other Climate Watch species groups are responding to climate change.

**Your feedback**

In August 2016 we elicited feedback from chapter leads and volunteers through discussions and an online survey. The online survey received 38 responses from the 75 participants for which we have email addresses. Your feedback helped us assess the program design, learn of new challenges and answer concerns—what worked, what should be changed, and what could be helpful to people participating in the future, as well as insight into how National can support chapters in this new program. In response, we're updating the program and it's supporting materials to make participation clearer, easier, and more accessible.

Main takeaways and next steps based on the survey feedback include:

- Provide earlier notice of program dates to coordinators. Coordinators can now plan on Climate Watch occurring January 15-30 and June 1-15 every year.
- Expand the area covered by survey squares to allow for participation from anywhere, including areas not covered in 2016.
- Provide a PowerPoint presentation and script for coordinators to share with potential participants.
- Improve and provide additional training around the use of the Climate Watch Planner Map.
- Clarify participant vs. coordinator instructions in protocol documents.
- Include additional frequently asked questions in the FAQs document.

Thanks again for all of your efforts in collecting and submitting data as well as providing feedback.

**Next Steps**

The next edition of Climate Watch will occur January 15-30, 2017. In 2017 we will be adding four additional species to Climate Watch! We will continue to focus on the three species of bluebird, in addition to including the four species of nuthatch: Brown-headed Nuthatch, Pygmy Nuthatch, Red-breasted Nuthatch, and White-breasted Nuthatch.

We would very much like to have your chapters continue to participate in the pilot program! We will also be engaging additional chapters to pilot the program in different parts of the country. Your experience in the first breeding pilot has been especially valuable, and we hope you will be interested in continuing your involvement in 2017.

We will keep in touch to distribute revised materials and invite you to discussions and webinars to organize the January pilot. Please look out for these invitations and feel free to contact the Climate Watch chapter and center support team if you have questions about Climate Watch at climatewatch@audubon.org.

**Climate Watch Planning and Implementation team:**

Brooke Bateman
Elizabeth Bergstrom
Kathy Dale
Gary Langham
Geoff LeBaron
Nicole Michel
John Rowden
Connie Sanchez
Zach Slavin
Lynsy Smithson-Stanley
Lotem Taylor
Chad Wilsey

**Climate Watch Chapter Support Team:**
climatewatch@audubon.org

Brooke Bateman
Director of Climate Watch
608-609-5743
bbateman@audubon.org

Kathy Dale
Director of Science Technology
610-563-0323
kdale@audubon.org

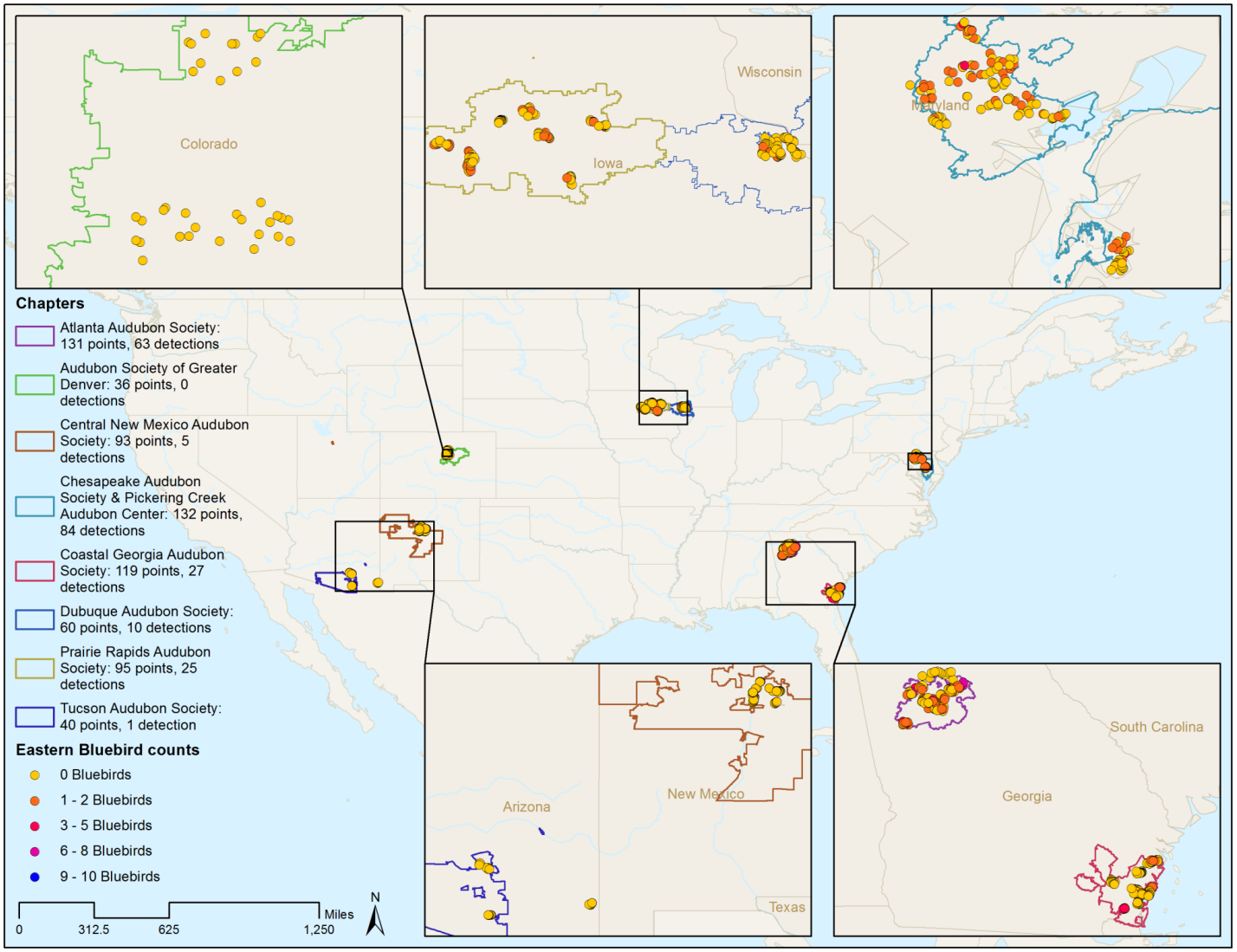
Geoff LeBaron
Director of the Christmas Bird Count
413-268-9372
glebaron@audbon.org

John Rowden
Director of Community Conservation
212-920-1883
jrowden@audubon.org

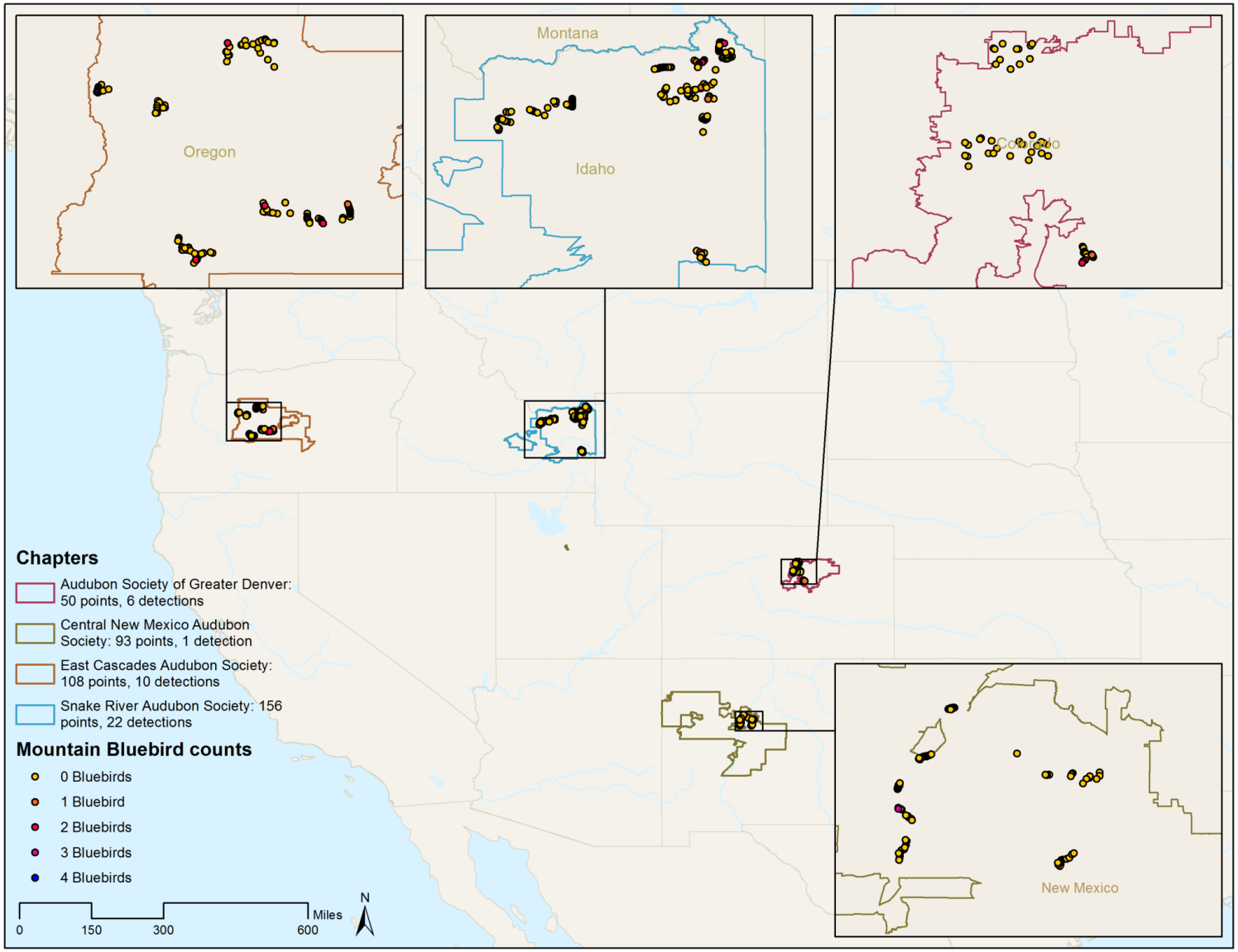
Zach Slavin
Program Manager
202-600-7962
zlavin@audubon.org

**Appendix: June 2016 Species Maps**

Eastern Bluebird



Mountain Bluebird



Western Bluebird