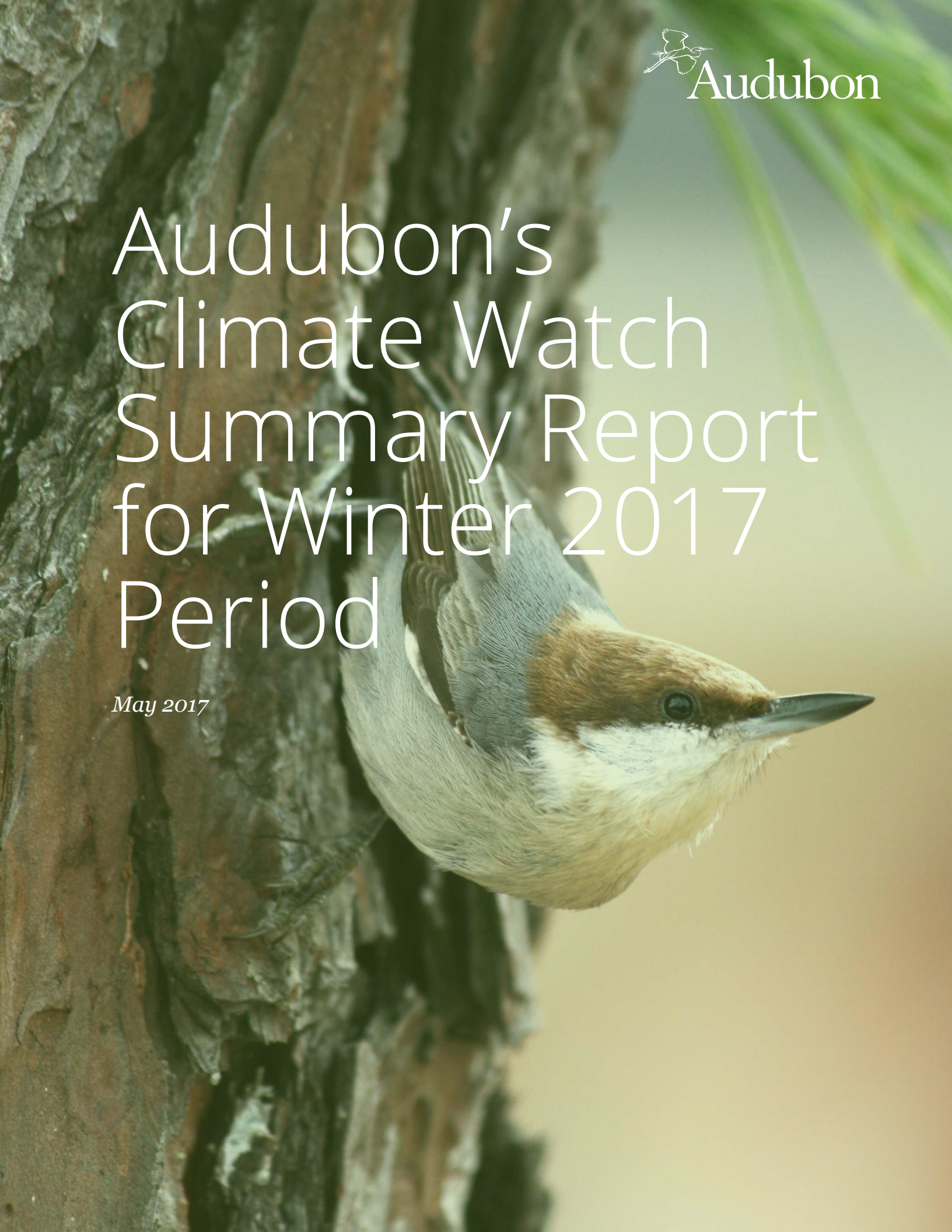


Audubon

Audubon's Climate Watch Summary Report for Winter 2017 Period

May 2017

Overview

The January 2017 Climate Watch pilot survey was the second winter season of Audubon's Climate Watch program. Climate Watch is a citizen/community science program that integrates species climate projections with community volunteers' local knowledge to study how birds will respond to climate change. In this report, we provide an account of the winter 2017 survey, including summary information on participation, data collected, data issues and potential solutions, participant feedback, and next steps for the program. An in-depth analysis of the data collected so far will be presented in the next Climate Watch report in late summer or early fall.

Climate Watch Summary Report for Winter 2017

With your help, we are doing important work for birds!

Climate Watch Winter 2017 Summary Report Overview

From January 15-30 2017, more than 260 dedicated volunteers traversed habitats across the U.S. to look for bluebirds and nuthatches in the second winter season of Audubon's Climate Watch program. Volunteers collected data on seven target species: Eastern, Western, and Mountain bluebirds and White-breasted, Red-breasted, Brown-headed, and Pygmy nuthatches. Dedicated volunteers from 14 states and Washington, D.C. increased geographic coverage of the Climate Watch program. We thank everyone who took the time to participate in this effort to test Audubon's climate model predictions of future bird ranges. These regions contain key areas where Audubon's climate models predict bluebirds and nuthatches will gain, lose, or maintain stable breeding range over the next 15 years and beyond due to climate change.

The chapters and centers that participated in the January 2017 winter survey for Climate Watch are:

Arkansas River Valley Audubon Society, AR
Atlanta Audubon Society, GA
Audubon Center at Riverlands, MO
Audubon Society of Corvallis, OR
Audubon Society of the District of Columbia, DC
Audubon South Carolina (State), SC
(Augusta-Aiken Audubon Society, Charleston Natural History Audubon Society)
Austin Audubon Society, MN
Big Bluestem Audubon Society, IA
Buffalo Audubon Society, NY
Central New Mexico Audubon Society, NM
Chesapeake Audubon Society, MD
Coastal Georgia Audubon Society, GA
Elisha Mitchell Audubon Society, NC
High Peaks Birders, Yancey County, NC
John James Audubon Center at Mill Grove, PA
Madison Audubon Society, WI
Mecklenburg Audubon Society, NC
Mesilla Valley Audubon Society, NM
Napa-Solano Audubon Society, CA
Olympic Peninsula Audubon Society, WA
Pickering Creek Audubon Center, MD
Prairie Rapids Audubon Society, IA
St. Louis Audubon Society, MO
Wake Audubon Society, NC
Wildcat Glades Audubon Center, MO
Wyncote Audubon Society, PA

Climate Watch Winter 2017 Survey Results:

Continued Growth of the Program

The winter 2017 Climate Watch survey had more than 260 volunteers participating from 20 Audubon chapters, four Audubon centers, one Audubon state office-coordinated effort, and one independent birding group. These coordinated efforts took place across 14 states and Washington, D.C. We had five returning coordinated groups and 21 new coordinated groups. North Carolina, Georgia, New Mexico, South Carolina, and Missouri had the highest overall participation rates.

States and Districts Participating:	Arkansas, California, Georgia, Iowa, Maryland, Minnesota, Missouri, New Mexico, New York, North Carolina, Oregon, Pennsylvania, South Carolina, Washington, Washington, D.C, Wisconsin
Returning Groups:	Atlanta Audubon Society, Audubon Society of Corvallis, Buffalo Audubon Society, Chesapeake Audubon Society, Coastal Georgia Audubon Society
New Groups:	Arkansas Rivery Valley Audubon Society, Audubon Center at Riverlands, Audubon Society of the District of Columbia, Audubon South Carolina (Augusta-Aiken Audubon Society, Charleston Natural History Audubon Society), Austin Audubon Society, Big Bluestem Audubon Society, Central New Mexico Audubon Society, Elisha Mitchell Audubon Society, High Peaks Birders, John James Audubon Center at Mill Grove, Madison Audubon Society, Mecklenburg Audubon Society, Mesilla Valley Audubon Society, Napa-Solano Audubon Society, Olympic Peninsula Audubon Society, Pickering Creek Audubon Center, Prairie Rapids Audubon Society, St. Louis Audubon Society, Wake Audubon Society, Wildcat Glades Audubon Center, Wyncote Audubon Society

The majority of Climate Watch volunteers spent between two to four hours planning surveys and scouting out locations. Personal knowledge of the local area, printable (PDF) maps supplied by Audubon, in-person scouting, and the online ESRI Climate Watch planning tool

were the most used tools to plan survey locations, in that order, although many people also used Google maps and eBird data. When selecting appropriate habitat for target species, Climate Watch volunteers were strongly influenced by their personal knowledge of the area's birds and habitat, but in-person scouting, satellite maps, and eBird information were also useful tools for many.

On average, individuals spent six hours over two days completing Climate Watch surveys. Participants that responded to our surveys said they would be willing to conduct surveys for nine hours over three days. This suggests that most volunteers are likely to take three hours to survey a single square on a single day, and would be willing to survey up to three squares.

Bird Observations Provided By You

Bluebirds outnumbered nuthatches as target species (68% vs 22% of survey respondents). We had nearly 2,700 checklists, and almost 14,000 data points across 208 species. For our target species, we had over 1,700 bluebird records and 1,500 nuthatch records. Numbers for each target species were as follows:

- Eastern Bluebird
    - 1,016 individuals across 438 locations
    - Range of 1-15 individuals seen at one time
    - Average of 2.32 individuals when present at a location
- Mountain Bluebird
    - 212 individuals across 18 locations
    - Range of 1-37 individuals seen at one time
    - Average of 11.78 individuals when present at a location
- Western Bluebird
    - 438 individuals across 74 locations
    - Range of 1-56 individuals seen at one time
    - Average of 6.53 individuals when present at a location
- White-breasted Nuthatch
    - 1,197 individuals across 886 locations
    - Range of 1-9 individuals seen at one time
    - Average of 1.35 individuals when present at a location
- Red-breasted Nuthatch
    - 72 individuals across 58 locations
    - Range of 1-3 individuals seen at one time
    - Average of 1.24 individuals when present at a location
- Brown-headed Nuthatch
    - 242 individuals across 148 locations

    - Range of 1-7 individuals seen at one time
    - Average of 1.64 individuals when present at a location
- Pygmy Nuthatch
    - 12 individuals across 6 locations
    - Range of 1-4 individuals seen at one time
    - Average of 2 individuals when present at a location

Occurrence maps of target species are displayed at the end of this report in the Appendix.

Our goal is to analyze these data to learn how bluebirds and nuthatches are responding to a changing climate as it happens. Given that participation in the Climate Watch survey is expanding and our data handling needs are growing (see section below: Data Entry and Submission), we will now be providing general summary reports after each survey period, and an annual in-depth statistical analysis of the data collected from both winter and summer survey periods. This more in-depth report detailing the analysis of how the Climate Watch species are responding to climate change will follow later in 2017.

Improvements in Data Entry and Submission

We are excited about the growth in the Climate Watch program, as it means we will better be able to determine how birds are responding to climate change. However, it also means we are working with increased amounts of data handling and processing and the technology needs that come with more participation. In the past, the Climate Watch team manually entered all Climate Watch checklist data into a database for our analyses. Our winter 2017 survey posed a problem, as with increased participation manual data entry was no longer feasible. To deal with this we developed an interim software tool that automates our data upload and processing, helping us work with the increased number of survey checklists we received. The development of this tool took time, and subsequent testing and refining of the program delayed our data processing timeline (see Figure 1).

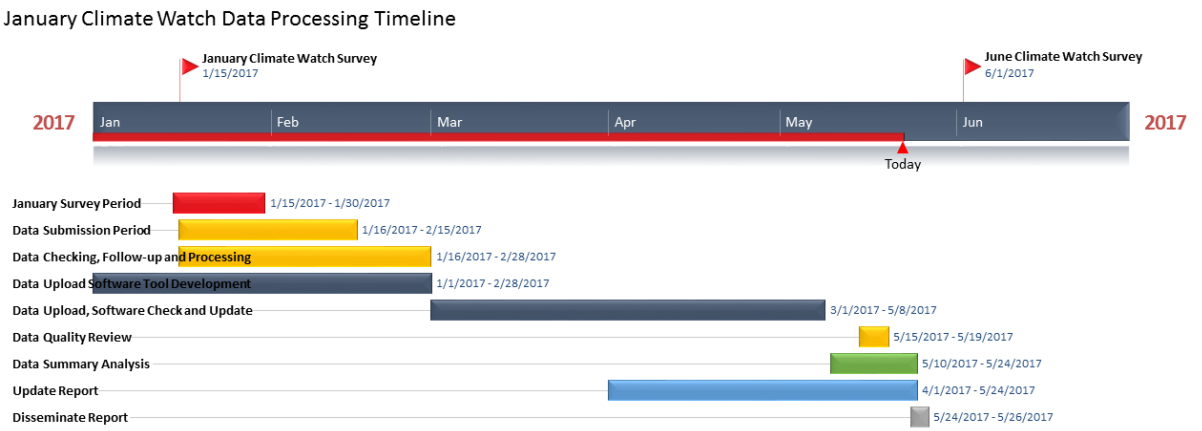


Figure 1. January Climate Watch data processing timeline

The majority of the data sent to us by volunteers was entered into eBird (both mobile and desktop versions). The use of eBird helps to standardize our data collection efforts across volunteers, although there are still data issues that we need to address. Checklists sent to us from eBird desktop can be uploaded through this new software tool, which greatly sped up our processing time. However, the various formats of data we received meant we still needed to process many checklists manually. This included any checklist sent to us directly from the eBird mobile app that lacked a report ID or URL link, which is required for the software tool to extract the needed data. In addition, checklists sent to us using the "share" checklist feature in eBird needed to be manually entered and also were missing key information.

As Climate Watch grows as a program, we ask that all checklists be emailed to us from the web version of the eBird site. We have provided a video tutorial on our website (audubon.org/climate-watch) on how to copy and paste the URL link for each of your 12 Climate Watch survey checklists, add them to one email, and send them to climatewatch@audubon.org. Many of you highlighted that the data submission process was cumbersome and not straightforward, so we hope that this will streamline the data submission process.

In addition, we are working to address incomplete or non-standard data entry reported across many checklists, with the most common data issues listed below. The statistical analyses that we run on Climate Watch data require target species, party size, species counts, location, time of day, and presence of any nest boxes or feeders at the survey location. In addition, some fields are required to assure that the data have all been collected in the same standardized manner (a stationary 5-minute point count where the presence and count of all bird species

seen or heard were recorded where the observer was able to identify them). Without all of this information, data from the survey will not be useable for our analyses.

Data Entry Issues: Commonly incomplete or incorrect data fields included: Not reporting the target species, protocols other than stationary (e.g. traveling), no party size (common omission due to mobile checklist submission), duration other than 5 minutes, no time of day, no observer (common omission due to mobile checklist submission), no coordinates (common omission due to mobile checklist submission).

We are working toward an integrated data submission platform to address some of these issues, and we hope to make that available for Climate Watch surveys in the near future.

What We Heard From You

In March 2017 we elicited feedback from our Climate Watch winter 2017 coordinators and volunteers through discussions and an online survey. The online survey received 104 responses. The feedback we received helped us assess the Climate Watch program, identify what worked well and what was in need of improvement, and what new information or materials we can make available to people participating in the future. As this program grows, we hope to use feedback to make participating clear, easy and accessible.

The majority of volunteers (92% of survey respondents) found the protocol clear and easy to follow. The 2-page Climate Watch description, frequently asked questions, and protocol documents were most useful to the volunteers. Paper (PDF) maps were more likely to be used (63% of respondents) than the online mapping ESRI Climate Watch planner tool (44% of respondents). Live webinars and how-to videos were useful to a minority of our volunteers (40%).

Eighty-five percent of respondents felt that the 15-day window was long enough, and 79% felt the daily time period of sunrise through noon was appropriate. Weather obstacles were the most frequently reported, followed by difficulty locating enough accessible areas to survey and trouble finding the right habitat. Other difficulties were a result of time and scheduling (busy time of year, coordinating schedules, needed more time to plan and/or complete surveys) and

unanticipated logistical issues (e.g. GPS failure, road/trail closures, noise pollution, illness, or traffic). Some volunteers said that they would like more information about the Birds and Climate Change Report as it relates to this project, the research goals, and survey design. We had many participants suggest pairing inexperienced birders with more experienced birders (i.e. know bird identification by sight and sound) or pairing more technologically savvy individuals with those newer to using smart phones (i.e. those that have used the eBird app before).

Specific feedback on problems or requested resources are summarized below:

ESRI Climate Watch Planner Tool Issues:	Printing difficulties, zooming problems, naming and numbering changes, outdated maps, colors and names on maps hard to work with, route finding directions issues.
ESRI Climate Watch Planner Tool Requests:	Share a specific location or square with others, identify square, basemap with public and private lands, increase coordinate precision, export points/coordinates to file.
Issues Identified:	Labeling and naming of survey locations needs improvement, more information on how to submit and email checklists to Audubon, more guidance on how to designate points within a square (spread out, clumped, randomness), what to do with points when survey location has had habitat alteration or was determined not to be ideal for target species, how to deal with timing issues of completing points in morning, clarification on the use of playback and pishing, better notification of program dates, data submission process needs clarification.
Resources you would like to see:	eBird use and data entry guide, short engaging video on the program for potential new volunteers, tips on how to choose sites with best habitat for target species, dedicated app with GPS and data submission, how to connect you to a mentor in your region, map showing which squares already adopted, social media and press release template, tailored target species information sheets and social media posts.

After reviewing the feedback, we have made several changes to the program. This includes changes to the protocol, updated tools, and new materials. All of these resources can be found on our website (audubon.org/climate-watch).

New Materials:	Map for claiming a grid square, updates to the ESRI Climate Watch Planner Tool (filtering by season, share a location, export coordinates to file, and more), webinar recording on the ESRI Planner Tool updates, links to target species Birds and Climate Change Report information and Audubon Field Guide information, two-page project overview, one-page protocol overview, redesigned protocol as a survey manual, video on how to submit your eBird data, updated frequently asked questions, video on what's new for this survey period.
In the Works:	eBird use and data entry guide, short engaging video on the program for potential new volunteers, dedicated app with GPS and data submission, how to connect you to a mentor in your region, social media and press release template, tailored target species information sheets and social media posts, Climate Watch photo submission portal.

We thank you for the feedback on the Climate Watch program, as your feedback allows us to improve the program and make it easier for us to support you as volunteers. We are happy to share that 100% of Climate Watch survey respondents said they would like to participate in Climate Watch in the future, with 76% stating they would be very likely to. We are thrilled to continue to support you all as we work together to let the birds tell us how climate change is affecting them as it happens. Thank you for all of your input and hard work!

Join us for the June 2017 Count

Our next survey period for Climate Watch is June 1-15, 2017. In this survey period, we will be piloting Climate Watch outside of the Audubon network and have invited any group with an interest in community science, birds, and climate change to participate from now on.

Now that our new software tool for data upload has been tested, improved, and implemented successfully, we hope to upload and process data at a faster rate while also identifying data issues as they happen. We look forward to analyzing the increased data records across all of our target species after the June survey and reporting back to you on how these species are tracking climate-related range shifts.

We will continue to provide support to our coordinators and participants, and will be improving and developing new materials (as outlined above) and a new website.

Climate Watch Planning and Implementation Team

Thanks for all that you do for the birds and for being the force behind Climate Watch. Because of you, we are able to let the birds tell us how climate change is affecting them as it happens. Thank you from the Climate Watch Team:

Brooke Bateman	Director of Climate Watch
Liz Bergstrom	Climate Content Manager
Kathy Dale	Director of Science Technology
Gary Langham	Director of Science
Geoff LeBaron	Director of the Christmas Bird Count
Nicole Michel	Senior Quantitative Ecologist
John Rowden	Director of Community Conservation
Connie Sanchez	Director Important Bird Areas Program
Zach Slavin	Program Manager, Citizen Science
Lotem Taylor	GIS Technician
Chad Wilsey	Director of Conservation Science

Climate Watch Support Contacts:
climatewatch@audubon.org

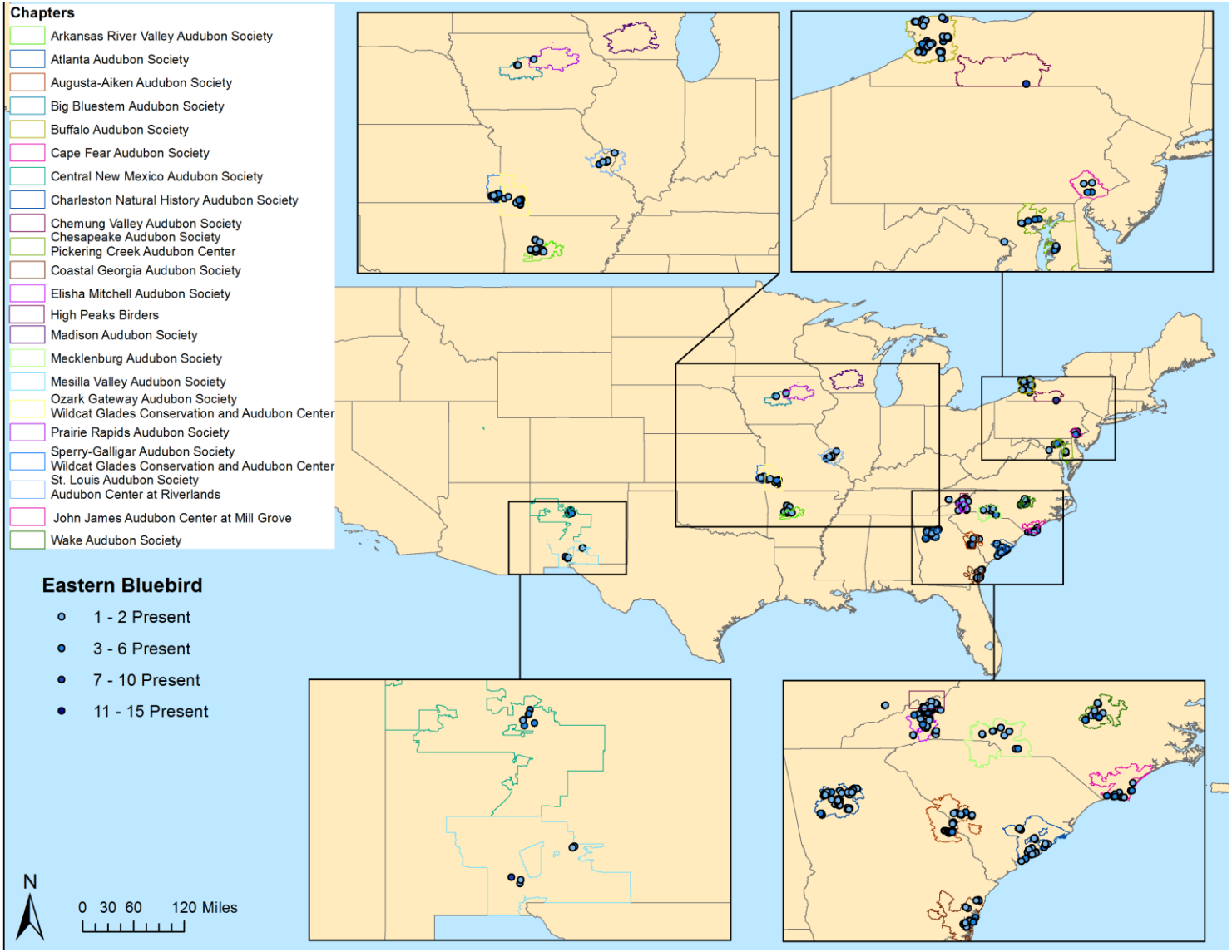
Brooke Bateman
Director of Climate Watch
608-609-5743
bbateman@audubon.org

Zach Slavin
Program Manager, Citizen Science
202-600-7962
zslavin@audubon.org

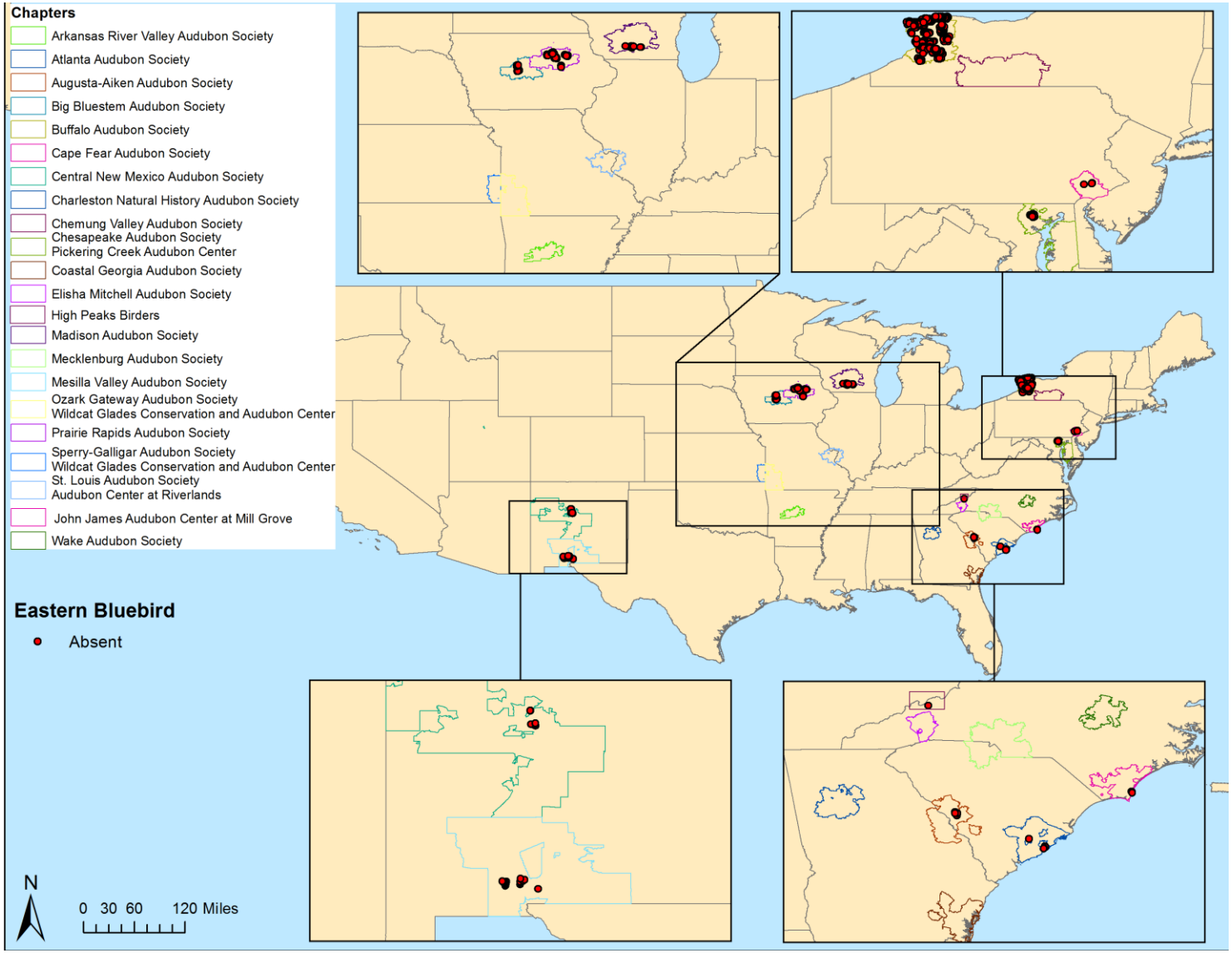
Appendix: January 2017 Species Maps

This appendix includes maps for all target species presence and absence data. At this point the absence data are incomplete, and these will be updated once we resolve some of the missing target species information needed to determine where surveys were completed for a specific target species, with zero birds of that species sighted.

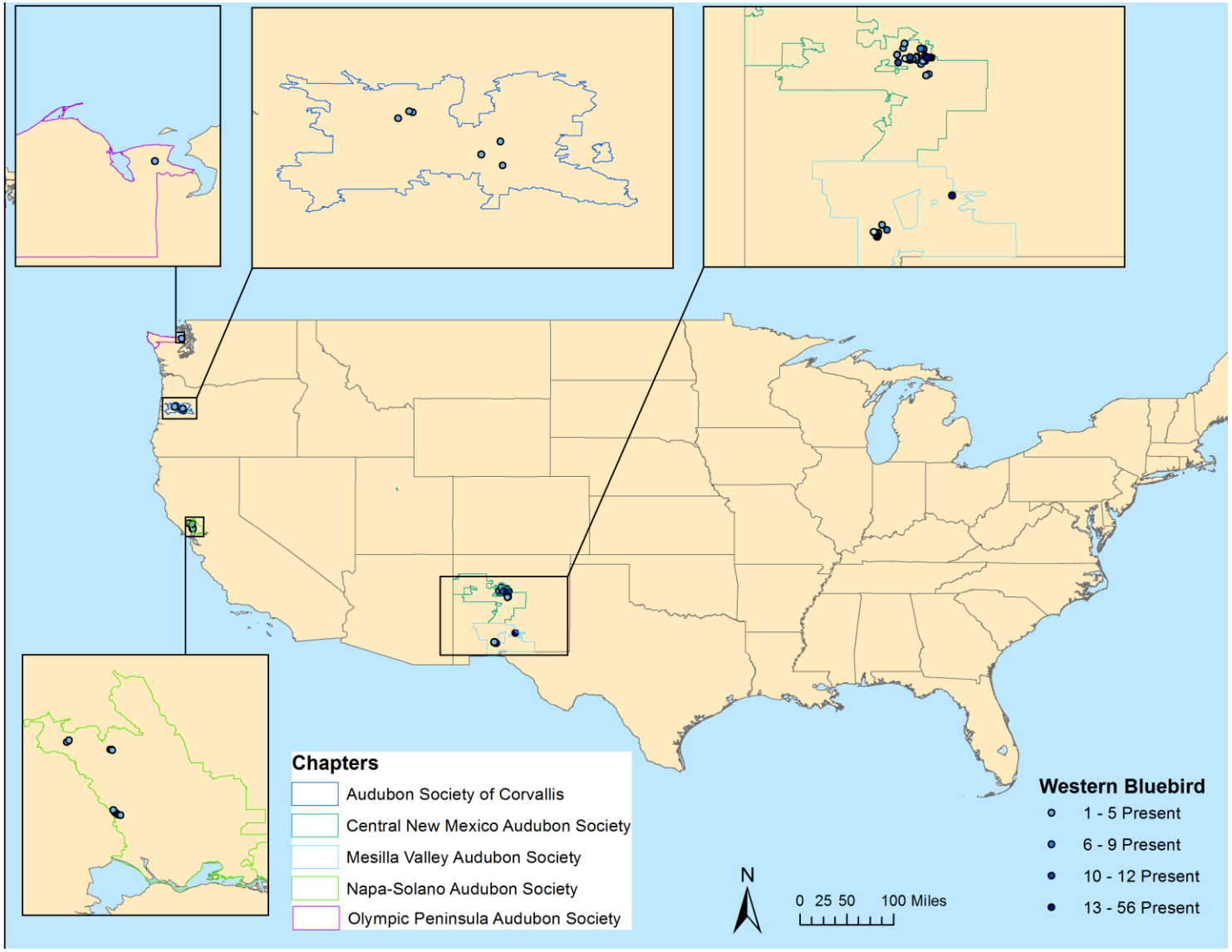
Eastern Bluebird: Presence



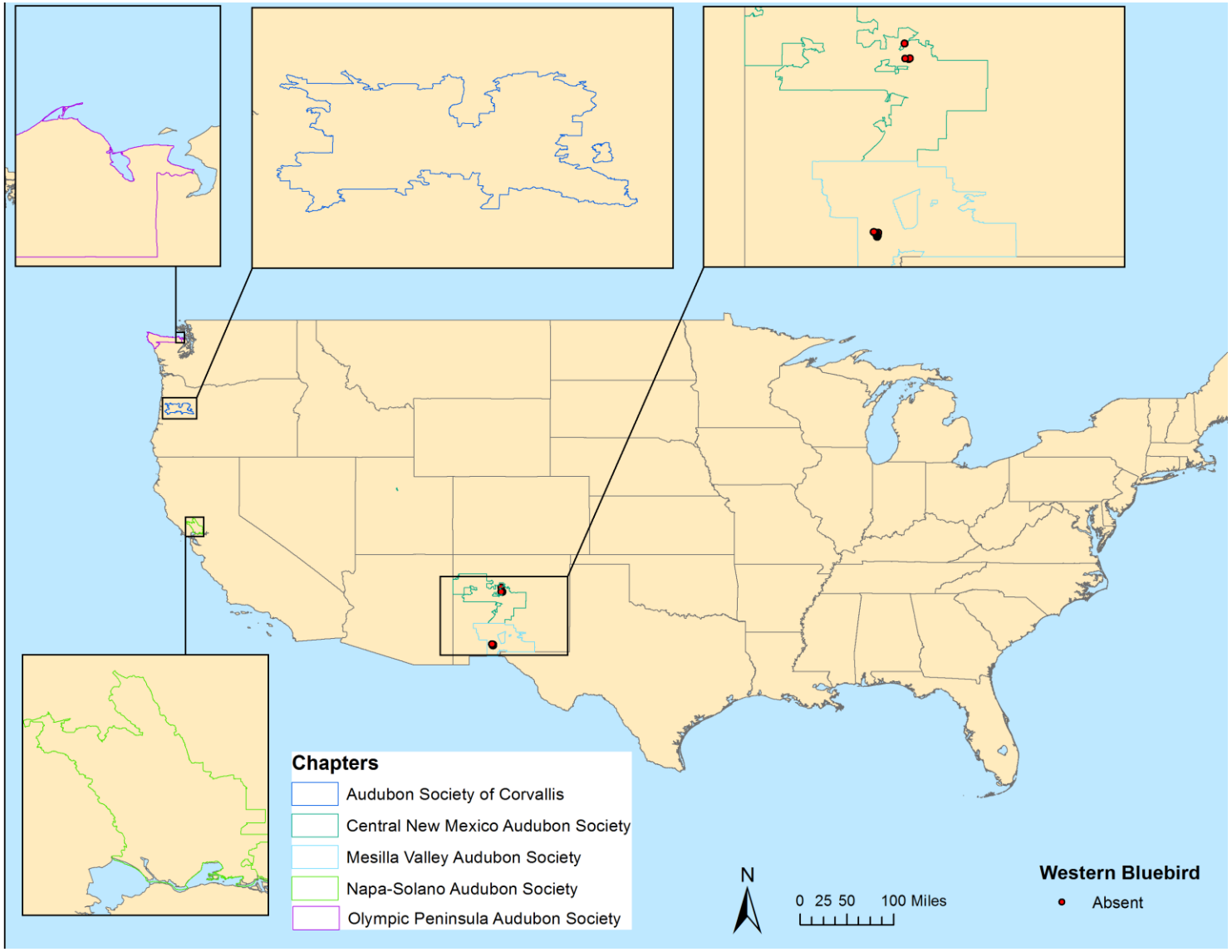
Eastern Bluebird: Absence



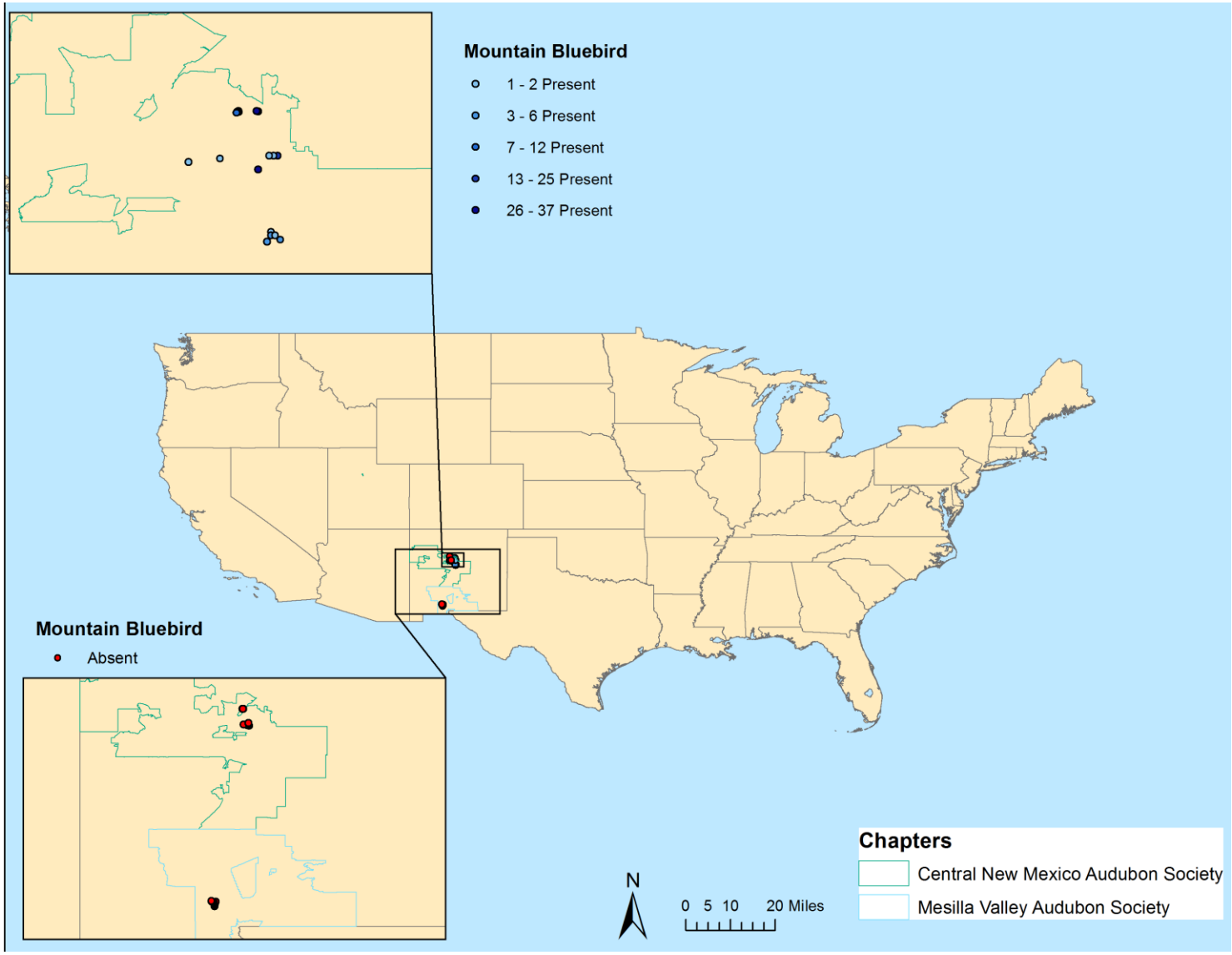
Western Bluebird: Presence



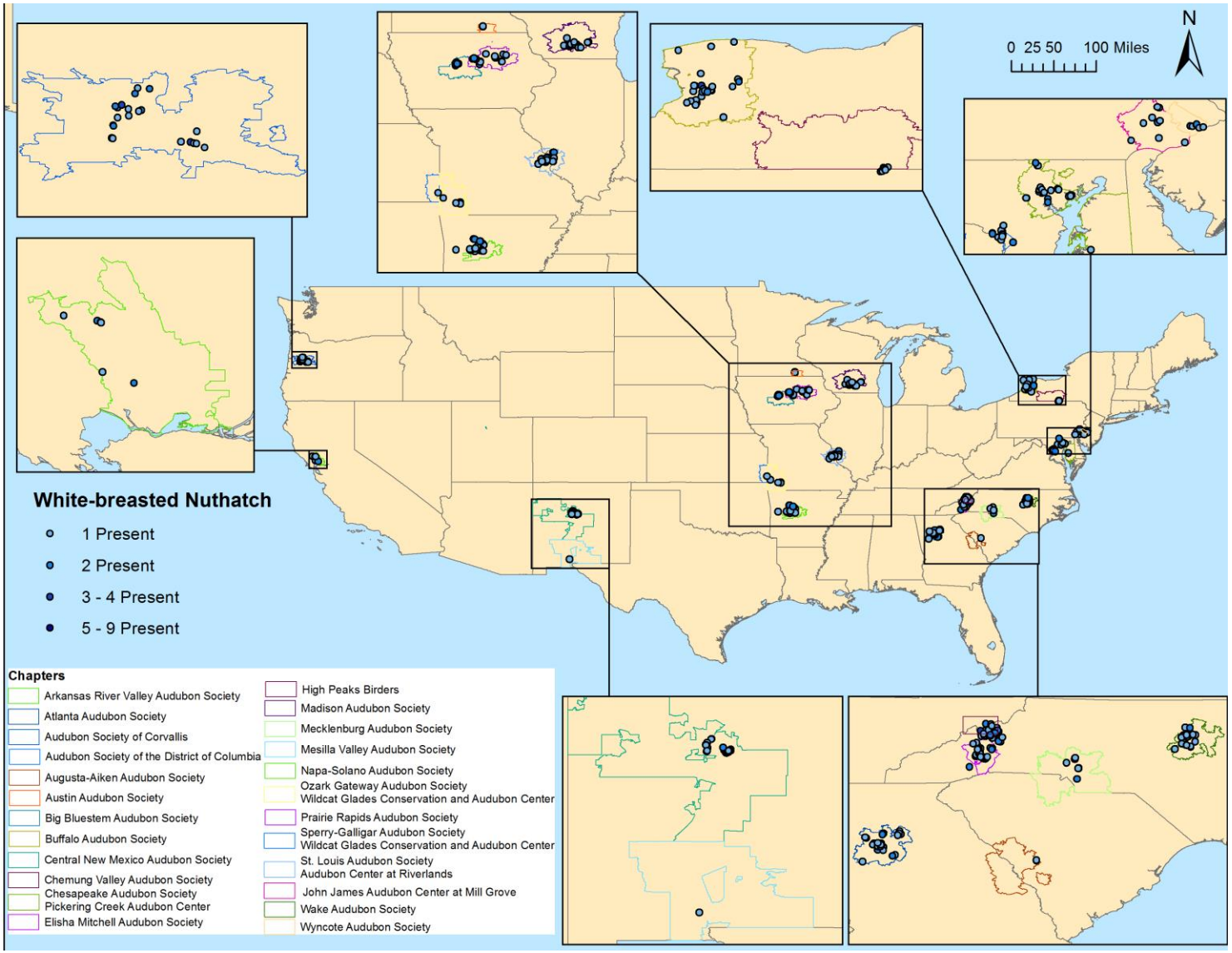
Western Bluebird: Absence



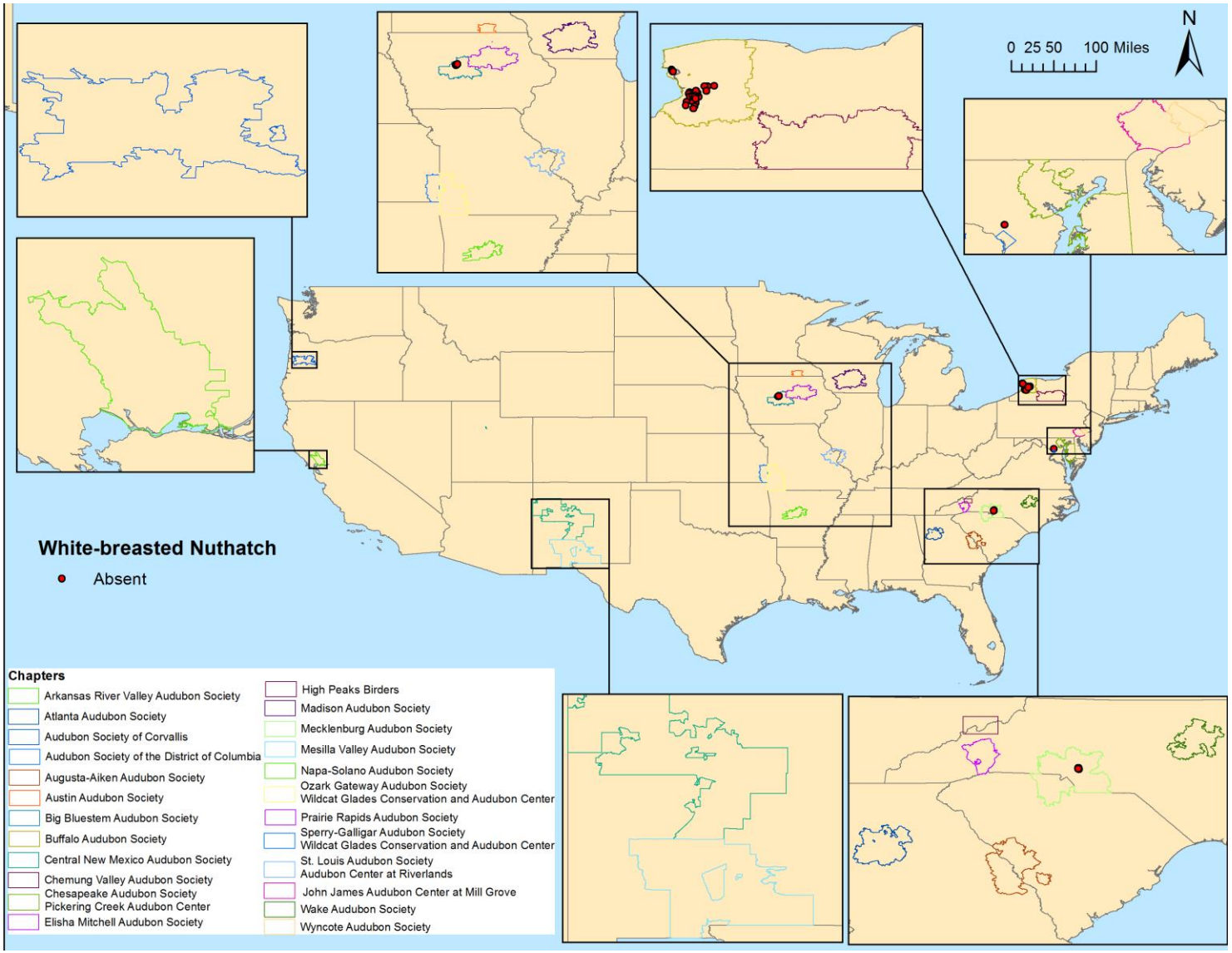
Mountain Bluebird: Presence and Absence



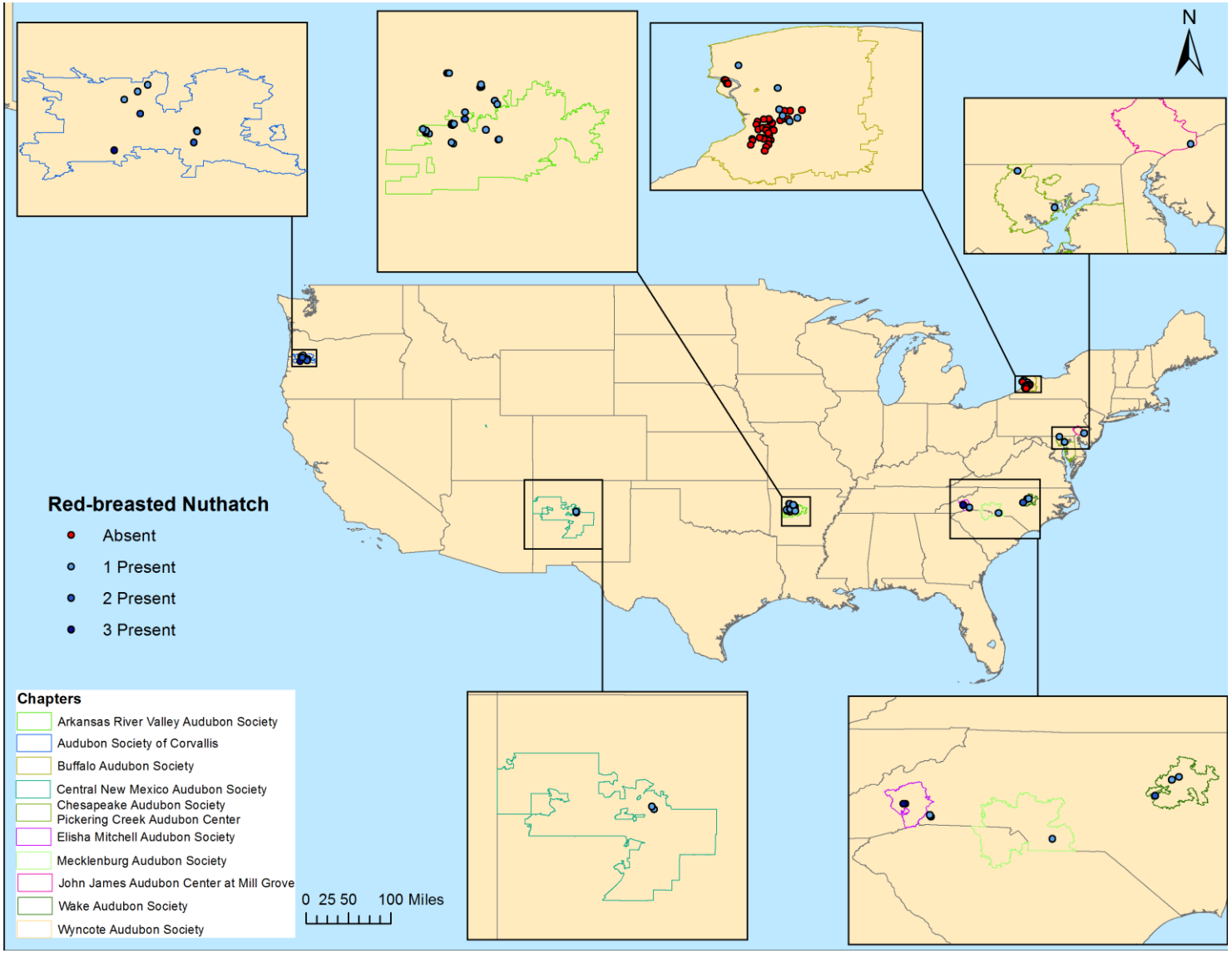
White-breasted Nuthatch: Presence



White-breasted Nuthatch: Absence



Red-breasted Nuthatch: Presence and Absence



Brown-headed Nuthatch and Pygmy Nuthatch: Presence and Absence