

Climate Watch Survey Manual

*This manual contains the instructions on how to conduct surveys for
Audubon's Climate Watch Program*



General Overview

Audubon's Birds and Climate Report (<http://climate.audubon.org/>) predicts that more than half of North American bird species will lose more than 50% of their current climatic range by 2080. To test these predictions Audubon has developed a new citizen science project, Climate Watch. Climate Watch aims to document species' responses to climate change and test Audubon's climate models by having volunteers in the field look for birds where Audubon's climate models predict them to be in the 2020s.

Climate Watch Contacts:

Brooke Bateman, Director of Climate Watch
Zach Slavin, Program Manager
climatewatch@audubon.org

Thank you for participating in Audubon's Climate Watch survey. Here is a brief overview of the Climate Watch survey protocol. Each section will be covered in more detail in the main document.

- **Climate Watch Roles**
 - Regional Coordinator, Local Coordinator, and Participant role details, recruiting and training participants
- **Timing**
 - Two times per year, with both Winter and Summer Survey periods
- **Target Species**
 - Selecting a target species for which to survey
 - Target Species: Eastern, Western, and Mountain bluebirds and/or White-breasted, Red-breasted, Brown-headed, and Pygmy nuthatches
- **Selecting Squares**
 - Select 10 x 10 km squares from the Climate Watch maps to survey
 - Coordinators should ensure that a minimum of ten squares are selected to survey for a target species in your area.
 - Individuals participating outside of a coordinated area should choose one or more Climate Watch squares to survey
- **Planning Survey Locations**
 - Identify 12 points that represent the best accessible habitat for the target species within a given square
 - Points should be at least 200m apart to avoid double-counting the same areas
- **Conducting Surveys**
 - Conduct 5-minute stationary point counts at each of the 12 points
 - Surveying one square takes an average of 3-4 hours (2-6 hour range)
 - Record observations with eBird, with each point count as an individual checklist
- **Entering Data**
 - For each checklist, please record:
 - Start time, number of observers, latitude and longitude, and grid-square id
 - Total number of each species (target species and other bird species you are able to identify) that you see or hear within 100 meters of your location, line of sight permitting

- The presence of nest boxes or feeders within the survey area (recorded in comments section)
- Your target species (recorded in comments section)
- Be sure to answer “yes” to the question “Are you submitting a complete checklist of the birds you were able to identify?” to indicate you are submitting a complete checklist.
- **Data**
 - Email your 12 eBird checklist urls to climatewatch@audubon.org
 - Please email the checklists as opposed to using eBird's share feature. See full manual for more details.

Table of Contents

Participant and Coordinator Roles	6
Timing	7
Target Species	8
Selecting Squares	9
Planning Survey Locations	10
Conducting Surveys	11
Entering Data	12
Submitting Data	13

Climate Watch Survey Manual

Participant and Coordinator Roles

Much like with the Christmas Bird Count there are different potential roles for individuals interested in volunteering with the Climate Watch project:

Regional Coordinator: Volunteers who facilitate the Climate Watch program at a state or regional level, by identifying, recruiting, and training local coordinators and connecting individual volunteers with coordinated efforts in their state. Regional coordinators are critical for volunteers to participate in this program across the state - they will gain valuable experience facilitating this community science effort across a large landscape and serving as the primary point of contact.

Coordinator: Volunteers who manage their group or area's participation in Climate Watch by recruiting participants, training them to plan and conduct Climate Watch surveys, and ensuring that the data they collect are submitted to the national Climate Watch team. The coordinator also communicates the science and rationale behind the program, including providing information on the predicted future range changes of the target species. Without a regional coordinator, coordinators will also serve as the main point of contact with the national Climate Watch team and help to improve the program by providing feedback based on their group's experiences.

Participant: Volunteers who complete Climate Watch counts in collaboration with their group's Climate Watch coordinator. Participants serve a critical role, collecting data that will validate the current projections of Audubon's climate models and we hope they will gain valuable monitoring skills.

Throughout this document, we will provide information more relevant to the Coordinator role in 'Coordinator Callout Sections'.

***Coordinator
Callout-
Recruiting
Participants:***

Consider recruiting local Audubon chapter or center members, individuals that participate in other monitoring and community science programs like the Christmas Bird Count, Breeding Bird Survey, eBird, or bluebird nest monitoring programs, etc., and members of other local birding groups or local clubs with an interest in birds or wildlife monitoring. In addition, using social media platforms or website sign-up pages can be a great way to recruit new volunteers. You might also try identifying individuals that have a designated volunteer hour requirement, such as master naturalist programs.

Coordinators should aim to recruit ten or more Participants, at least one per square. Please keep the number of observers at each point to a maximum of three to minimize variability. Depending on location and means of travel, conducting twelve five-minute surveys within a square should take approximately 3 hours (2-6 hour range).

Timing

Climate Watch will occur over two distinct time periods each year, in the winter (January 15- February 15) and in the breeding season (May 15 – June 15). Participants may choose to conduct their point counts on one or more days of the count period. Participants should attempt to conduct point counts in the morning (before noon) and to complete all twelve surveys for a given square on a single morning whenever possible. If weather conditions or other unforeseeable delays occur, the late afternoon period is an option and it is preferable to complete a set of point counts in one day including the late afternoon than to split them over multiple days. Starting close to sunrise is advisable to coincide with the peak of bird activity, particularly during the summer survey.

Coordinator Callout-Training Participants:

Coordinators play a vital role in informing local Participants about how to participate in Climate Watch and we ask that you also work to communicate why participation is so valuable by explaining the science behind Climate Watch and how these surveys will help us better understand birds' reactions to climate change. Audubon has a variety of resources available for coordinators to use to impart information on the science background and rationale for the Climate Watch project. These resources include a PowerPoint presentation, links to the Bird and Climate Change Report page for each of the target species, and a 2-page overview of Climate Watch. These resources, as well as many others, can be found on the project website:
<https://www.audubon.org/climatewatch>

Target Species

Climate Watch is focused on target species for which our climate models have strong predictions and which have a high detectability in the field. Currently we are focusing on two groups of species: bluebirds and nuthatches. Specifically, Climate Watch Participants are asked to survey for Eastern, Western, and Mountain bluebirds and/or White-breasted, Red-breasted, Brown-headed, and Pygmy nuthatches. Work with your coordinator to determine for which species you should conduct surveys.

***Coordinator
Callout-Selecting
Target Species:***

We ask that Coordinators provide guidance to Participants on which target species they should plan surveys for. First, prioritize species for which you have surveyed previously in your area, as repeat surveys for the same species groups in the same locations are the most valuable. Next, you can choose based on which species have the strongest predictions for change according to the climate models (the strongest blue [worsening climate suitability] or yellow [improving climate suitability] squares on each species map), which species have the most local interest or conservation concern, or which species have the most accessible habitat in your area. Participants in your area may conduct surveys for multiple target species but we ask that you complete a minimum of 10 squares for each target species before surveying for additional target species. As an example, surveying 10 squares for Eastern Bluebirds would produce more valuable data than surveying 5 squares each for Eastern Bluebirds and White-breasted Nuthatches. You may survey for different target species within the same squares although the 12 survey points within a square for each target species will in most cases be different (see below).

If you have multiple bluebird or multiple nuthatch species in your area and the habitat is consistent across species, you can survey for multiple target species simultaneously. For instance, if there are both Western and Mountain bluebirds in your area and they use similar habitats you can conduct one set of 12 surveys within a square for both bluebird species. Depending on habitat use by the target species in your area you may be able to survey for multiple nuthatch species simultaneously as well but

generally not bluebirds and nuthatches as the two groups require you to target different habitats, unless in your location bluebirds and nuthatches reliably use the same habitats (for example, in heavily agricultural areas where both groups are restricted to small patches of natural habitat).

Selecting Squares

Participants should work with Coordinators to select squares within or around your location in which to conduct surveys. Each group should aim to conduct surveys in a minimum of 10 squares in their area for a target species. Participants can conduct surveys in one or more squares, and can split points within squares with others. Consider the following criteria in priority order when selecting which squares to survey:

1. If your location has previously participated in Climate Watch you should target the same squares year to year. Square selection may vary between summer and winter but try to survey the same points in the same squares summer to summer and winter to winter for the same target species to collect comparable data.
2. Prioritize squares outlined in blue (where models predict worsening climate suitability) or in yellow (where models predict an improving climate suitability) or squares with the largest numerical change in climate suitability, positive or negative. There may not be any blue or yellow squares in your area and surveys from squares with smaller predictions for change in climate suitability and from the gray (stasis/no change) squares are also valuable.
3. Select squares with appropriate and accessible habitat for the target species.
4. Select squares that are close to where Participants live to minimize travel time.

***Coordinator
Callout-
Additional
Squares:***

If you are interested in conducting additional Climate Watch surveys beyond the 10 squares with 12 surveys each for a given target species, we ask that you prioritize another set of 10 squares with 12 surveys each for a different target species, completing another full set of surveys. The next best option for additional efforts would be to survey additional squares with 12 surveys each for your original target species.

Planning Survey Locations

Participants should then identify their twelve survey points within each square. Survey locations can be plotted on the paper or web maps provided by the national Climate Watch team (see audubon.org/climatewatch for maps) or you can capture their GPS coordinates in the field. There are a number of factors to think about when planning your survey locations:

- Select survey points in the best possible habitat for the target species within each square. Identify the best habitats based on your personal knowledge, the knowledge of Coordinators and other local experts, the satellite maps provided, or in-person scouting of the area.
 - Note: while you are allowed to identify your point count locations “on the fly” in the field, be sure not to select them based on the current presence of individuals of the target species as this would not provide an accurate sampling of the target species’ distribution. Instead, identify appropriate habitats and conduct surveys there regardless of the initial presence of the target species.
 - Note: you may target different areas across the summer and winter seasons based on differences between winter and summer habitats of the target species but it is best to return to the same survey points each winter and another set of survey points each summer for a given target species. Surveying these same points (or as close as possible) winter after winter and summer after summer provides us with more valuable data on long-term changes in occupancy. You may also use the same points for a target species between winter and summer if the habitat use is the same in both seasons in your location.
- After considering the best habitat available in a square, you should prioritize placing your points so that you can complete all of your surveys in one day as opposed to spacing your points evenly throughout an entire square.
- Survey points should be a minimum of 200m from any other survey point in the square to prevent double-counting. You can estimate this distance as two football fields or using pacing in the field or measure it using the online maps provided.
- Survey points should be physically and legally accessible – you should be able to drive or walk there safely in winter or summer and have the proper permission to access the property. Do not enter private property without prior permission.
- Be sure to consider visibility and elevation when selecting your survey locations and consider consulting a topographic and/or satellite map or

doing in-person scouting to identify points with the best view of your survey areas.

- Take care to note hunting seasons within public lands in your location, particularly in the winter, and avoid areas with active hunting.
- Feel free to select survey locations with nest boxes and/or feeder stations for the target species within the survey area but please note their presence in the comments of your eBird checklists for those surveys.
- If conditions at one of your survey points have changed significantly since the last survey period, and the area no longer represents appropriate habitat for your target species please move your survey point to the nearest location with appropriate habitat within the same square.

Conducting Surveys

First, consider the weather and conduct your surveys only if the conditions will not jeopardize your safety or impact the detectability of the target species. A light breeze or intermittent precipitation will not affect detectability, but avoid conducting surveys in steady rain, snow or during periods of high winds.

Surveys should be done as stationary counts, meaning you stand in one place and record birds seen or heard from that location, and should be conducted for exactly five minutes each with a maximum of three observers to reduce variability. You should record each five-minute survey separately and enter them into eBird individually (see the Entering Data section for detailed instructions on entering your data into eBird). During each survey be sure to record:

- Start time
- Number of observers (1-3 observers per survey)
- Latitude and longitude
 - You can capture your location data using the eBird mobile app, record it as Latitude and Longitude using a smartphone or GPS unit, or mark it on a paper map for entry into eBird later on. Be sure to capture and record coordinates in decimal degree format (e.g., 32.30642° N 122.61458° W, not 32° 18' 23.112" 122° 36' 52.488").
- Total number of each species (target species and other bird species you are able to identify) that you see or hear within 100 meters of your location, line of sight permitting.
 - Keep separate totals for each species seen on each survey.

- Record what target species you surveyed for and the presence or absence of any nestboxes or feeders at your survey location in the comments section of your checklist.
- If you count for more than five minutes start a new list at that point so you can enter just your first five minutes of observations into eBird for Climate Watch.
- If you are interrupted or distracted significantly during your five-minute survey period, consider starting another five-minute count at that location.

Entering Data

Currently we are collecting Climate Watch data using eBird. Enter your data into eBird at www.eBird.org or from the field using the free eBird mobile app available for iOS or Android. The eBird app can be used to capture your location automatically in the field where coverage is available:

<http://ebird.org/content/ebird/news/mobileglobal/>

For specific instructions on entering Climate Watch surveys into eBird using the desktop site or mobile app consult the videos here:

<https://www.audubon.org/conservation/climate-watch-pilot-program>

Submit your data regardless of whether or not you saw any target species at a given point. An important part of this effort is conducting surveys in areas where the target species are not yet likely to be. Data documenting the absence of target species is an important part of tracking when target species show up in new areas or abandon others, so be sure to record and submit your surveys even when you do not observe any individuals of the target species. Additionally, please be sure to include which target species or target species group you surveyed for in the comments section of your checklist. This ensures that we can match your target species with your checklist data for our data analysis. In addition, the presence or absence of nestboxes or feeders is important component of detection for our target species, so we ask that you record this information in the comments section as well.

Each survey should be entered into eBird as a separate checklist. If you completed twelve surveys, you will submit twelve checklists into eBird. When entering your data into eBird you will be asked a number of questions about your birding and can answer them as follows:

- Where did you bird? If you collected lat/long in the field you can select "Use Latitude/Longitude" and enter it there, otherwise enter your

county and state in the “Find it on a Map” field and use the map interface to indicate your survey location – toggling to the satellite view can help you place your points more accurately using landmarks on the ground. (Note: if using the eBird mobile app this can be captured automatically when coverage is available)

- Since we hope to have Participants return to these same points in future seasons you may want to provide instructions on how to name points/locations in eBird. There are a number of ways to do this but many Coordinators have suggested naming conventions that include the square number, the survey number out of twelve, the species that you are targeting habitat for, the lat/long, and any other information that can help guide someone back to this same spot next year. For example: USA-CA-03489, 1/12, WEBL, -122.163 x 39.744, 300 feet from the water fountain
- Date and Effort: Enter the date and start time of your observation. All surveys should be submitted using the observation type “stationary.”
 - Then enter your start time, count duration (should always be five minutes), and the number of observers (1-3).
 - Indicate which target species you were conducting surveys for by entering the species name(s) in the comments.
 - Note the presence of nest boxes and/or feeders within your survey area in the comments.
- On the next page you will be asked to enter your bird observations. Enter the number of each species that you saw, making sure to enter your complete checklist for the five-minute survey.
- Be sure to answer “yes” to the question “Are you submitting a complete checklist of the birds you were able to identify?” to indicate you are submitting a complete checklist.
 - Note: this question does not ask if observers were able to identify all of the species they saw, but rather is making sure you are not intentionally excluding species that you were able to identify. Answering yes allows us to assume that if you did not indicate the presence of a target species they were not present.

We are working on a data collection platform that will be integrated into the Audubon app that is free to download and will be updating the data collection section when it is fully available.

Submitting Data

Once your checklist is entered, please either copy each of the 12 checklist urls into one email (see video on the Climate Watch website) and send that to us or use the “Email Yourself” link from the eBird desktop website on the

checklist review page and forward those emails to climatewatch@audubon.org. While we encourage you to use the eBird mobile app for data entry we ask that you avoid using the email checklist feature in the mobile app to email your checklists to us as it does not include all of the information that we need when sent from mobile. Please also avoid using the share checklist feature, as this feature was intended for those individuals who conduct surveys together.

***Coordinator
Callout-
Additional
Squares:***

Participants (with help from Coordinators as needed) should enter each of the 12 surveys from each square as separate eBird checklists and email the resulting checklist urls to the national Climate Watch team at climatewatch@audubon.org. Each group should aim to submit a minimum of 120 checklists (10 squares x 12 surveys per square).

More Information on Audubon's Climate Watch program can be found at <https://www.audubon.org/news/climate-watch-program>

Please enter and email all Climate Watch survey data collected by July 1st for the summer season and February 28th for the winter season.