



NEON Breeding Landbird Technical Working Group

2020 Annual Report



1685 38th St., Suite 100 | Boulder, CO 80301 | 720.746.4844 | www.neonscience.org

National Ecological Observatory Network (NEON) is a project sponsored by the National Science Foundation and proudly operated by Battelle.

Introduction

Since its inception, NEON has relied on expertise within the science, education, and engineering communities to advise on key areas impacting the design, construction, and maintenance of the observatory with the goal to optimize its operation. Currently, two types of external advisory bodies support staff and leadership in making key decisions that guide all of NEON's activities: the Science, Technology & Education Advisory Committee (STEAC) and Technical Working Groups (TWGs). Both bodies are comprised of experts nominated to serve in these roles who are selected by NEON staff following a rigorous selection process.

NEON currently relies upon input from 22 TWGs. These groups play an important role by providing input to NEON's data collection and processing methods and ensuring that NEON infrastructure, data, and programs are a valuable community resource. Working groups are participatory and advisory; they are often tasked with providing input on issues that have scientific, educational, engineering, or operational implications.

This document includes a summary of activities, recommendations, and NEON's response to those recommendations for the Breeding Landbird TWG during the 2020 funding year (November 2019-October 2020).

The Breeding Landbird Technical Working Group provides expert input and advice regarding the science design and protocols related to NEON breeding landbirds sampling.

Q1 – November 2019-January 2020

Summary of Activities

The December 5, 2019 kickoff meeting was attended by nine new and returning Bird TWG members, three members were unable to attend. In addition to the previously identified priority topic of optimum sampling windows, members identified additional topics including:

1. Consideration of additional data QA/QC processes,
2. Need to identify research questions that can be addressed with bird and ancillary NEON data, and
3. Continued exploration of bio-acoustic monitoring (including for fine-tuning sampling windows based on detected arrival dates).

With regard to the first topic of optimum sampling windows, we briefly discussed how sampling windows have been determined to date, provided a summary of those dates for each site, and a summary of the actual field sampling dates in the data collected through 2019.

TWG Recommendations

No recommendations were made at this initial meeting.

NEON Response

N/A

Q2 – February 2020-April 2020

Summary of Activities

The Bird TWG met on April 2, 2020. We started off by discussing the current impact on field data collection due to COVID-19. 2020 sampling will be determined on a site by site basis as deemed feasible by Bird Conservancy of the Rockies and their subcontractors in accordance with federal, state, local, and landowner rules and regulations. A TWG member offered to loan bio-acoustic autonomous recording units (ARUs) that could be deployed by local people without bird ID expertise.

We talked about constraints and logistics such as site access and how to store and process a new type of data, and about how it would be optimal if ARU deployment was in parallel with human observations to allow for cross-comparisons. On the main topic of Optimal Sampling Windows for bird data collection, there was general agreement that the windows should be narrowed and that in some cases they should be shifted later in the season.

TWG Recommendations

1. To prevent data loss in 2020, NEON should work to deploy ARUs at select field sites to capture bird audio recordings otherwise lost in 2019. ARUs can be deployed by untrained individuals so site hosts or others already at sites can deploy them to avoid COVID-19 related restrictions on social distancing or travel restrictions on subcontractors. These same sites should have ARUs deployed in 2021 to allow for comparing the ARU “point counts” to human point count data.
2. The optimal sampling windows should be narrower. Determination of these windows should use expert knowledge and quantitative analysis of data.
3. NEON should deploy ARUs for ~2-month periods to help identify the peak (and any shifts) in breeding timing.

NEON Response

1. Permits would need to be obtained before deploying ARUs and the timeline would likely be too short to accomplish this before the 2020 field season. In addition, most sites don't have on-site staff that could deploy ARUs in accordance with various state directives and site closures. Consequently, there are too many obstacles to allow for deployment of ARUs for the 2020 field season. NEON plans to further explore whether to deploy ARUs in 2021 for reasons unrelated to COVID-19.
2. Sampling windows based on expert knowledge: The contracting organization (Bird Conservancy of the Rockies) will draft revised sampling windows to be brought back to the TWG.
Sampling windows based on data analysis: The data analysis will take considerable time to complete. Therefore, the TWG leads will bring this recommendation to the internal feedback approval process to determine budget and personnel availability to fulfill this recommendation.
3. This change will require several changes to the existing protocol, including the purchasing of ARUs, the use of NEON Field Scientists to deploy and recover ARUs, new permits and site host permissions to deploy ARUs, and new cyberinfrastructure to host the ARU data. The TWG is working with NEON to submit a proposal to the NSF.

Q3 – May 2020-July 2020

Summary of Activities

The TWG met on June 29, 2020 and discussed sampling regimes for the automated recording unit (ARU) proposal to be submitted to the NSF. Among the considerations were how to reduce data storage costs while still preserving the ability to look at seasonal phenology and spatial heterogeneity.

TWG Recommendations

The TWG recommended that the ARU proposal include three different levels of sampling effort corresponding to three different budget levels, and that this be accomplished by staggering deployments (e.g., some or all individual ARUs only record every 4th day but staggered such that $\frac{1}{4}$ of ARUs are recording every day).

NEON Response

NEON staff revised the ARU proposal according to TWG recommendations.

Q4 – August 2020-October 2020

Summary of Activities

The TWG met on October 20, 2020.

- 1) TWG discussed the newly revised bird survey sampling windows, which are narrower and, in most cases, later in the season.
- 2) TWG discussed current QA/QC procedures and future tweaks
- 3) TWG discussed full acoustic ARU (automated recording unit) proposal to NSF.

TWG Recommendations

- 1) TWG approved the Bird Conservancy of the Rockies (BCR) recommended survey sampling windows.
- 2) Continue looking at additional ways to QA/QC data as close to the time of sample collection as possible.

NEON Response

- 1) Bird Conservancy of the Rockies will use the newly approved survey sampling windows starting in 2021 field season
- 2) Sam Simkin (NEON) to continue discussion with Chris White (BCR) about additional QA/QC measures.