

everyday SCIENCE



Research in Your Backyard: Participating in the Practices of Science

Every November, thousands of avid birdwatchers join the community of fellow birders who participate in Project FeederWatch, one of several citizen-science projects operated by the Cornell Lab of Ornithology in Ithaca, New York. The goal of the project is to enhance scientific research by providing a cadre of “citizen scientists” with the opportunity to contribute to science while pursuing their own interests. Participation begins by downloading (or receiving in the mail) the FeederWatch Research Kit, which describes the project goals and rationale, instructions for setting up an observation area, procedures for collecting data, and a subscription to the project newsletter, which includes detailed results of FeederWatch data.

The success of the project depends on the quality of the data submitted from participant observations. To make the data collection process easier, online data collection forms are tailored for each region depending on the types of birds known to be in that area. If the submitted data match expectations, they are automatically added to the database. If unexpected information is reported, such as a bird species outside its usual habitat or expected range, the entry is flagged for review by a project staff member, who looks over the data to see if more information is needed. An e-mail conversation may ensue.

“When those situations occur, we find that the participants are often correct,” says Rick Bonney, director of program development and evaluation at the Cornell Lab of Ornithology. “They have observed something we did not know was there, which adds to our overall knowledge.” All par-

ticipants can access the database and work with the data to answer their own questions as they arise.

This project has been in place for more than 20 years, making the lab staff among the first to give the public an opportunity to collect data and be part of authentic scientific research. The thinking behind the project was that giving “regular” people the chance to engage directly with phenomena and learn how to conduct investigations would help them become comfortable with the tools and practices of science.



Since its inception, thousands of people have participated in this and similar programs. Over the years, staff at the Cornell Lab of Ornithology have worked to perfect these programs by conducting regular participant surveys, which are used to develop a profile of the participants and determine which

aspects of the program are most popular and how best to ensure that participants are able to make valuable scientific contributions and are themselves well served.

The surveys reveal that typical participants tended to be college-educated white women over the age of 50 who, despite having watched or fed birds for years, still see themselves as intermediate birders. The vast majority of the participants make use of the website features, such as Rare Bird Reports, the Map Room, the Top 25 list of birds, the Personal County Summaries, or the State/Province Summaries. More than half of participants use such scientific tools as creating trend graphs for specific bird species.

When participants were asked if they have learned about birds from this project, the results were encouraging. About 50 percent said that they learned there was a greater diversity of species than they had known about before; 64 percent said that they had learned to identify more species; 74 percent said that they observed interesting behaviors; and 70 percent said that they learned how birds change throughout the seasons. Only 6 percent of the participants said that they didn't learn anything as a result of their involvement in the project.

Comments also show that the project added value to an existing hobby by providing tools that allowed participants to deepen their experience. A participant from North Carolina remarked, "I loved feeding and watching the birds before, but now it is so much more interesting and useful."

A birdwatcher from New Mexico described how the project improved basic birdwatching skills: "After participating in Project FeederWatch for several seasons, my bird identification skills have improved immensely. This winter, I found myself identifying birds by their behavior: how they fly into the feeding site, where they land, if they sit or take right off again, and which feeder they choose."



Project FeederWatch participants feed birds throughout the year; they also observe, record, and report the birds that visit their bird feeders.

Challenging Enthusiastic Birders

Because so many participants return to the program year after year, lab staff have developed additional research projects to give them a chance to engage in deeper inquiry. One project, called the “Seed Preference Test,” was designed to find out which of three kinds of seeds ground-feeding birds liked best—sunflower, millet, or milo. The hypothesis developed by the lab staff was that sunflower was the preferred seed, but participants from the Southwest discovered otherwise. The birds in their region loved milo, also referred to as sorghum. Staff were intrigued by this surprising observation and wanted to find out if milo had been getting a bad rap. So they extended the experiment for 1 additional year.

The research project resulted in a small media buzz. It was featured on *Good Morning America*, boosting enrollment to more than 17,000 participants. About 5,000 people completed the observations, documenting half a million bird visits and showing seed preferences for more than 30 species. The findings confirmed the reports from the Southwest about seed preferences for birds in that area, proving that the lab staff’s original hypothesis was incorrect.

Another research project added to FeederWatch was the House Finch Eye Disease Survey. This project was initiated by FeederWatch participants, who observed house finches with puffy eyes during the winter months. Since then, participants have noted how the disease, identified as conjunctivitis, has spread throughout North America’s house finch population, causing their numbers to decline. Citizen scientists have proven to be an integral part of the scientific research team, documenting a serious population decline that could help in the understanding of disease outbreaks in other animal populations.

What is particularly interesting about this phase of the project is the number of questions staff received about the experimental process. Many of these queries focused on hypotheses that participants were developing to help explain their results. This kind of activity showed that not only were participants fully engaged in the project, but also they were taking scientific inquiry to the next level. They were using scientific methods and applying them appropriately to answer their research questions. As a result, participants were learning about science in the context of real scientific research.

Citizen scientists are becoming indispensable to the research efforts of the Cornell Lab of Ornithology. They are contributing to scientific knowledge about ecology and bird-feeding patterns in their regions. In fact, their findings have been included in articles published in peer-reviewed journals.

“We are not just being nice in letting the public participate in these projects,” says Bonney. “Their scientific data are extremely important. Increasingly, the scientific community is depending on this work to further our understanding of North American birds.”²