How Community Science Benefits Our Birds

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Chestnut-sided Warbler in my parents' yard

As an ecologist-in-training, questions of tractability often bother me. When I study a natural system, am I asking questions worth answering? And – once I have answers – are they actually usable to conserve, protect, or help that system survive?

This is a big issue in my field. Ecosystems worldwide face unprecedented rates of climate change, invasive encroachment, and human disturbance. Species are going extinct at frightening rates. Ensuring scientists can provide timely, robust answers to the difficult conservation questions faced by policymakers, advocacy groups, and land managers has never been more crucial.

Yet there remains a consistent gap between scientific questions and conservation answers. Some solutions involve more collaboration between scientists and policymakers themselves, to ensure we are both asking scientific questions with applicable answers and applying policies with a sound scientific backing. But other solutions simply require looking towards a different kind of data.

That data is community science. Perhaps my favorite consequence of today's explosive surge in smartphone usage is a fine selection of increasingly popular nature apps. Prominent on my home screen are iNaturalist, which helps identify photos of flora or fauna, and the Merlin-eBird duo, the former of which offers bird identification tips and the latter of which records all bird species found at different locations.

While these apps are (in my opinion) both great fun and very educational, they have an added benefit: the gathered information doesn't just collect dust in your phone's memory bank. It feeds the largest databases of species occurrence to ever exist, such as the Global Biodiversity Information Facility, which are used in all sorts of vital research on where species are, where they are moving, and where they are struggling. The uses of this data are far more tangible and immediate than academic papers.


Tree Swallow in the KLT Community Garden

Take, for example, the designation of a species as *Endangered*. Here in the United States, we usually think of such species in terms of the Endangered Species Act of 1972, our country's dominant law for protecting vulnerable species from further perils and restoring their populations to safer levels.[1] On a global scale, these designations are also classified according to the International Union for Conservation of Nature (IUCN) Red List, which serves a similar function.[2]


Peregrine Falcon at Hammonasset Beach State Park

These statutes use criteria like how many individuals of a species are left in the wild, how quickly their population or habitat size is shrinking, or whether the species is likely to experience existential threats to determine if it should receive designations like *Threatened* or *Endangered*.[3] Those labels, once applied, offer that species some of the most binding legal protection possible. Such protections successfully brought raptors like Bald Eagles and Peregrine Falcons back from the brink of extinction by banning the use of the pesticide DDT.[4] They also make *Endangered* designations the subject of fierce political debate, particularly when that designation would result in realized or potential economic harm (the contentious debate over whether Gray Wolves should be protected as an Endangered Species[5] falls into this category).

As useful as these criteria are for determining whether a species is vulnerable, the conservation of many remains at the mercy of a dubious label: DD, standing for ***D**ata **D**eficient*. These unlucky species might qualify for – and badly need – the protections offered by such policies, but there is not enough known about them to sort them into the appropriate category. These are the species that are at risk of vanishing without us even putting up a fight.

This was the sad state of several Chilean bird species back in 2012, when their DD-designation on the IUCN Red List made them ineligible for consideration in conservation planning. eBird to the rescue! With a concentrated effort, over 3,000 eBird records provided the necessary datapoints to quantify the remaining abundance of those species and thus qualify them for the conservation protections, ensuring their continued survival in the country.

This success story is one of many inspiring tales in a 2016 review paper of eBird's conservation impacts, from promoting bird conservation plans from the state to the continental scale through organizations like Partners in Flight, to helping land trusts prioritize land acquisitions for the greatest avian benefit. The authors, led by Cornell ornithologist Brian L. Sullivan, chalk the accomplishments up to a key attribute of the app: "…reduc[ing] the 'knowledge to action' gap" that slows down the translation of many scientific findings into policy. Because eBird provides a plethora of credible, real-time, open-access data, it is easy to immediately parse that information to answer tractable conservation questions, such as which parcels of land are most critical to conserve for a certain species or which types of nest box should be put up on a certain preserve.


Eastern Kingbird in the KLT Community Garden

Like much community-collected data, the checklists submitted to eBird may include some inaccuracies. However, safeguards are in place to avoid faulty information about sensitive species. When checklists include rare-marked species (for eBird users, these

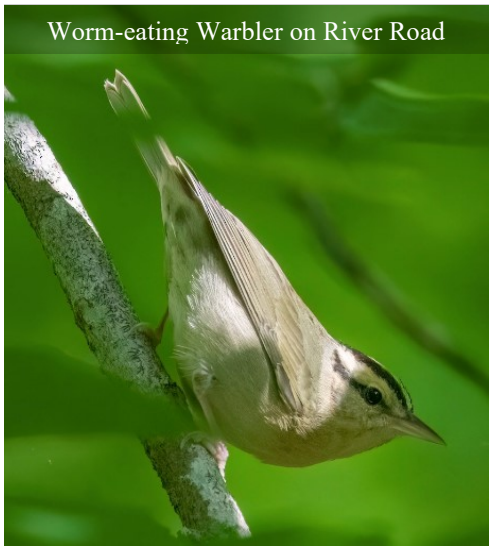

Ruffed Grouse in Litchfield County

are the ones marked with a little red dot!), birders are often asked to provide additional evidence, like a descriptive comment or a photo for proof. Experienced moderators keep an eye on checklists to offer insights on unlikely identifications – something I got firsthand experience with when I reported a lucky observation of a rare Ruffed Grouse while on a jog over Spooner Hill one spring. That observation quickly resulted in a polite email from Greg Hanisek, one of CT's moderators, asking me to please confirm that I hadn't seen the more-common, very similar-looking female Ring-Necked Pheasant (luckily, I'd seen the bird well enough to be sure it was a grouse – but I had no idea how much alike they looked until his note!).

eBird documentation also serves as proof of management success in many cases. Adding checklists to hotspots around Kent, for example, provides useful information about where and when conservation efforts are supporting different species. Our eBird hotspots show that locations in town are among the best in the state to see locally rare species like Cliff Swallows (nesting under the main bridge in town) and Cerulean Warblers (singing high in the trees along River Road).

On checklists last summer, I added reports of birds who used Kent's preserved interior forests as valuable breeding habitat. Chestnut-sided Warblers, Hooded Warblers, and Common Yellowthroats all carefully guarded nests in the trees by my parent's house off the Housatonic River. Journeying to Pond Mountain to seek the answers to Summer Exploration Challenge riddles awarded us with the silly sight of a recently fledged Worm-eating Warbler flying after its parents, mouth wide open, shrieking to be fed. As migration begins anew this year, I'll start marking down fresh observations of where different migrants show up for valuable rest and sustenance for their long flights north.

Each of these datapoints contributes not only to local efforts to promote the survival of birds in our town, but to global efforts to understand the needs of struggling birds worldwide. Each of these datapoints fights off designations like *Data Deficient*, or claims that we don't know quite enough about a species to protect it. Each of these datapoints shrinks that 'knowledge to action' gap by making sure we have all the real-time data we need to make the best possible conservation decisions for our birds, forests, and planet.


Worm-eating Warbler on River Road

Pushes to engage more people on apps like eBird or iNaturalist from organizations ranging from the KLT to the New York Times are all in service of this same goal. Every step we can take to find out where these critters are and what they are up to is one step closer to helping them survive alongside us in the changing world. But it's not just about the data – it's about engaging each and every one of us in caring for the vibrant world right outside our windows!

Photography from Cody Limber – see more of his work here!