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## The Androscoggin BioBlitz: a Citizen Science Biological Survey in New Auburn, Maine

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# The Androscoggin BioBlitz: a Citizen Science Biological Survey in New Auburn, Maine.

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## Abstract

After several weeks of planning, the Androscoggin Citizen Biological Survey, or “BioBlitz,” took place on August 11th, 2018 in New Auburn, near the confluence of the Little Androscoggin and Androscoggin Rivers. The BioBlitz was a Maine Conservation Voters (MCV) project and was conceived of and organized by a USM Environmental Science student interning with Maine Conservation Voters. In this BioBlitz, participants used the citizen science app iNaturalist to photograph wildlife of the river shoreline and add their observations to the app’s database. The Androscoggin BioBlitz project established on the iNaturalist website collected all of the observations made on August 11th in the Lewiston-Auburn river shoreline area into a single report, making it easier to survey the final observation tallies. In the space of approximately 2.5 hours, we observed and cataloged 102 individuals from 74 different species. 66.22 percent of species observed were plants, followed by insects (8.11%), ray-finned fish (6.76%), birds (5.41%), and others. Over 60% of all observations are currently Research Grade, indicating that they are of sufficiently high quality to be used as data points in scientific research. One example of the immediate utility of BioBlitz data was the observation of northern two-lined salamander (*Eurycea bislineata*), the presence of which was a strong indication that local water quality was high. This observation has already been added to the Maine Atlas of Reptiles and Amphibians Project (MARAP). In sum, this BioBlitz was a scientifically and educationally valuable citizen science project led by a USM student.

## Introduction

- As my capstone project for my Summer 2018 internship with Maine Conservation Voters (MCV), I organized a BioBlitz. A BioBlitz is a citizen science project in which a group of people (the majority of whom are generally non-specialists) work to catalogue all of the wildlife of a designated geographic area.
- On August 11, 2018, I led the Androscoggin BioBlitz, a citizen biological survey of the banks of the Little Androscoggin River in Auburn, Maine (Figure 2). This area was interesting for a few reasons.
- First, it was right in the middle of town, so we’d get to see what kind of species were able to thrive in a human-dominated area.
- Second, the Androscoggin watershed used to be incredibly polluted, with mills discharging effluent all along the river. In fact, it was one of the inspirations for the Clean Water Act. I was also interested in seeing how water quality regulations had helped the river recover.

## Methods

- To conduct the BioBlitz, we used the citizen science app iNaturalist, and our phones’ cameras, to catalog local wildlife. iNaturalist is a free app that you can use to upload pictures of plants and animals to a worldwide database, so that other users can identify them and scientists can use the identifications in their research.
- The Androscoggin BioBlitz project that I had established on the iNaturalist website collected all of the observations made on August 11th in the Lewiston-Auburn river shoreline area into a single report, making it easier to survey the final observation tallies.
- Citizen science observations from iNaturalist are already becoming a major source of data for environmental studies. Recent papers have used iNaturalist observations to study how black widow spiders are moving north, the evolution of dragonfly wings, how mountain goats are shedding their winter coats differently due to climate change, and much more.
- Thus, our BioBlitz both materially contributed to science and served as a way to engage citizens in the ecosystems around them.

Stats

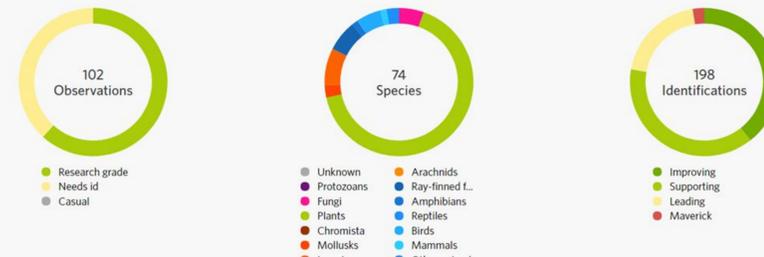


Figure 1: Statistics of the BioBlitz. Includes observations, species, and identifications.

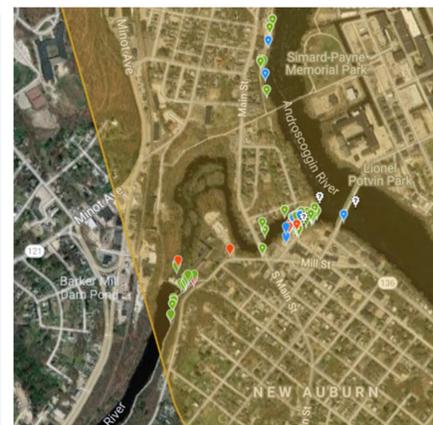


Figure 2: Map of the BioBlitz. Green icons symbolize plant observations. Purple icons symbolize fungi observations. Blue icons symbolize vertebrate animal observations. Orange icons symbolize invertebrate animal observations.



Figure 4. Northern two-lined salamander (*Eurycea bislineata*) logged during BioBlitz.

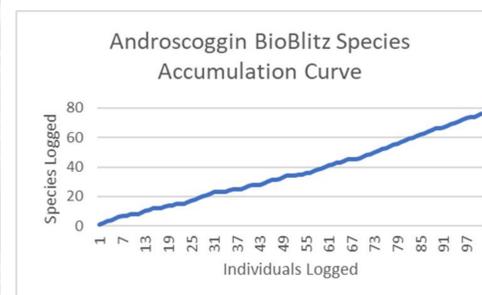


Figure 3. Collector’s Curve for the Androscoggin BioBlitz (species logged vs. individuals logged).



Figure 5. Smallmouth bass (*Micropterus dolomieu*) logged during BioBlitz.

## Results

- In the space of approximately 2.5 hours, we observed and cataloged 102 individuals from 74 different species (Figure 1). 66.22 percent of species observed were plants, followed by insects (8.11%), ray-finned fish (6.76%), birds (5.41%), and others. Over 60% of all observations are currently Research Grade, indicating that they are of sufficiently high quality to be used as data points in scientific research.
- One interesting species observed during the BioBlitz was a northern two-lined salamander (*Eurycea bislineata*, Figure 4). This species is highly sensitive to water quality, and is a strong indicator that the waters of the Little Androscoggin River are, to a first approximation, a pollution-free environment. This observation has already been added to the Maine Atlas of Reptiles and Amphibians Project (MARAP) on iNaturalist, an effort by the Maine Department of Inland Fisheries and Wildlife to document all of Maine’s “herps.” Its inclusion of this observation is an example of the immediate utility of BioBlitz data.
- Smallmouth bass (*Micropterus dolomieu*, Figure 5) are also very sensitive to water quality. They are also a highly popular game fish, and it was this circumstance that led to one being cataloged in the BioBlitz. I was surveying aquatic and shoreline plant life around the Barker Mill Dam on the Little Androscoggin River, and I noticed a fisher casting his hook in the spray just below the dam. I approached the gentleman, explained what I was doing, and asked if I could catalog any fish that he caught. He expressed great interest in iNaturalist, and kindly allowed his catch to be photographed. Minutes after this, he reeled in a smallmouth bass, and I photographed it. The bass was released afterwards. The positive outcome of this serendipitous interaction is highly encouraging for the future of citizen-led BioBlitz projects in Maine.
- Other notable observations include an osprey, crayfish, an array of wildflowers and insects, and much more. For all results, see [www.inaturalist.org/projects/androscoggin-river-bioblitz](http://www.inaturalist.org/projects/androscoggin-river-bioblitz)

## Discussion and Conclusion

- One of the BioBlitz participants who I taught to use iNaturalist now has 142 observations of his own, indicating that the BioBlitz sparked long-lasting involvement in citizen science for at least some participants.
- After the BioBlitz, I downloaded the iNaturalist data into Excel and created a species accumulation curve for the event. Individual organisms logged are on the X-axis and species logged are on the Y-axis. To my surprise, I found that the curve (Figure 3) showed no signs of leveling off. This indicates that despite three hours of intensive, multi-person surveying, we had barely scratched the surface of the Androscoggin shoreline’s biodiversity. This is a very exciting result, indicating that even in a relatively urban area, the species diversity is extremely high.
- Based on the results of the Androscoggin BioBlitz, the scientific and education potential of BioBlitz projects in Maine appears limitless.

## Acknowledgements

We thank iNaturalist, the Androscoggin Land Trust (co-hosts of the event), Dr. Joseph Staples, and MCV employees and volunteers for making this BioBlitz possible.