



NSRC Progress Report 2022

Jumping Worm Invasion and Impact in the Northern Forest

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Project Abstract

Jumping worms are earthworms from Asia that are invading and impacting ecosystems worldwide, including portions of the Northern Forest. Evidence is emerging that these species are damaging biodiversity, ecosystem services, forest regeneration, water quality, and recreational value in other regions. The vulnerability of specific areas within the Northern Forest to these earthworms and the magnitude of the threat they represent are unknown. Researchers are using an interdisciplinary, three-pronged approach to better understand this threat and lay the foundation for lessening impacts. First, they conduct training seminars and develop protocols to leverage a network of professional resource managers, citizen naturalists, and gardeners to detect, report, and monitor the distribution and phenology of jumping worms in the region. Second, they examine the environmental conditions associated with jumping worm presence and expansion to develop a model of vulnerability to jumping worm invasion in the region. Finally, they study the impact of jumping worms on biodiversity, nutrient cycling, water quality, and regeneration at select forested sites representing an invasion gradient.

This project will provide a greater understanding of the Northern Forest ecosystem, especially the forest floor, and its vulnerability to invasive threats. Improved knowledge of the biology of jumping worm species that threaten the Northeast will assist global efforts to understand and control these species, especially in northern latitudes. Finally, this project provides training to students at a variety of institutions and improves connections among natural resource managers and members of the interested public within the Northern Forest region.

Progress in 2022

We held a virtual meeting of stakeholders in May to define research needs of the community and the capacity of stakeholders to engage with our work. Since that time, we have connected with many individuals and organizations, including Master Gardener chapters, Wild Ones (native habitat gardeners) chapters, and other groups. We estimate that we have reached at least 300 potential partners with these programs. We now have a database of partners willing to monitor jumping worms in places distant from our institutions (e.g., Gary Fish, Maine Dept of Agriculture, Conservation, and Forestry). We constructed a protocol for these partners to collect data related to our second objective. The invitation letter and protocol can be accessed here:

[Community Partner Letter NSRC](#). Participants were able to request a packet of materials (including a ruler, soil bags, etc.) to facilitate sampling, and a database was established using ArcGIS Survey123. A dozen or so packets were mailed in summer 2022.



SUNY Cortland student Kayelah Brown holding jumping worms.



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We established 17 locations in Vermont and New York, including heavily invaded, poorly invaded, and uninvaded sites, to better understand invasion impact. The entire research team met in the Adirondacks and Vermont to collect samples (soil, litter, earthworms, earthworm cocoons, and other invertebrates) and data related to our third objective. The analysis of these samples remains ongoing. We also installed lysimeters and sentinel seedlings, which will be monitored for the remainder of the project.

Problems or Changes

The materials developed for use by partners to document new jumping worm populations were made available late in the 2022 field season. Therefore, only a few partners were able to use them. We are optimistic for wider participation in 2023 because we can contact partners early in the field season to claim time on their busy schedules. Some of the sites we had originally selected for use in our work on impacts (“impact sites”) were on New York State (DEC) properties within the Adirondack Park. The DEC did not allow us to plant our sentinel seedlings at those sites. (This decision could not be anticipated before the permit-approval process.)

Plans for 2023

We will continue to reach out to potential participants with outreach programs. For example, researchers are scheduled to talk with the Kirkland Birding Club and the New York Restoration Practitioners in early 2023. Each of these talks provides an opportunity to connect with interested citizens and professionals that might help us to document jumping worms in new portions of the Northern Forest. We will re-advertise the availability of our sampling kit and Survey123 form to potential partners in early spring. We aim to collect many new locations of jumping worms this season and determine how well those locations correlate with habitat and landscape characteristics. We will finish analysis of the samples collected last year at our impact sites and determine if further sampling is needed for soil chemistry or litter-animal extractions. We will plant our new sentinel seedlings early in the growing season when the soils are still moist from snowmelt and better survival is expected. We will monitor those seedlings, collect soil water, and monitor jumping worm populations through this year.

Collaboration

We work closely with our partners in the New York Invasive Species Research Institute (and associated PRISM offices) and public partners in other parts of the Northeast. These interactions have given us a better understanding of what research products would be most useful to managers and how these partners and participants might be able to help us document unknown populations of jumping worms in the region.

Each of us views outreach and collaboration with the public as an important part of our work with jumping worms. Below is a sampling of events conducted by us since the onset of the project.

- Invasive Jumping Worms: How to Spot Them and How to Stop Them! Russell Library, Russell CT.
- The Latest on Jumping Worms with Dr. Josef Görres: Why Do We Care and What Can We Do? Northern Woodland Field Day, Thetford Academy, VT.
- Jumping Worms in the Northeast: Their Spread, Distribution, and Control. Central New York Chapter of the Wild Ones.
- An interview for Northern Public Radio, Dekalb, IL.
- Presentations to the Master Gardeners of the State of Pennsylvania and Wood County and Kenosha County, WI.
- Panel discussion with Maine Cooperative Extension.