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Comparing larval wood frog growth and development in ephemeral wetlands via experimental transplant across a canopy cover gradient

Research Highlights

- Different pond characteristics impact tadpole growth and development at different points in time during the growing season.
- We transplanted tadpoles from eight different ponds to test the impact of light availability on tadpole growth and development.

Management Implications

We still know very little about how pond features influence amphibian development, so identifying the impact of individual characteristics can guide amphibian conservation efforts. In particular, knowing that changes in canopy cover may positively or negatively affect amphibian survival and growth can help guide forest managers in tree felling. Selective harvesting near wetlands that results in ideal canopy cover for amphibians allows for human use of forest products while conserving key aspects of amphibian habitat.



Research Summary

Since 2016, I have worked with Dr. Skelly's lab investigating wood frog tadpole development in different wetland environments. Previously, I conducted an observational study of ponds at Yale Myers Forest, where I catalogued aquatic and terrestrial traits of each pond (such as water pH, leaf composition, salinity) and measured tadpoles throughout the spring and summer. We found that different pond characteristics impacted growth and development at different points in the larval stage. However, across different ponds and different time points, canopy cover, or light availability, came back as a consistent factor. This guided the next phase of study, an experimental transplant between shaded and open canopy ponds, to isolate the influence of one specific wetland characteristic.

We selected eight ponds with a range of light availability, varying from heavily shaded to near-full sun exposure. We paired these ponds to have four pairs with a range of differences in canopy cover. Next, we collected wood frog eggs as they were laid, to incubate at a controlled temperature until hatch. This ensured that our tadpoles all started out in the ponds at roughly the same development stage. When all the eggs had hatched, we stocked mesh-lined cages with leaf litter and tadpoles from that pond, tadpoles from the paired pond, or a mix of tadpoles from each pond.

At the end of the growing period, we removed all tadpoles at the same time to have an equal comparison across their lifetimes. Currently, we are in the process of measuring and staging the tadpoles to determine if there are any differences in size and age between tadpoles raised in their natal pond versus their introduced pond, and if different levels of canopy cover resulted in different growth and development rates.

