

**Department of Fish and Wildlife**

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*Agency of Natural Resources*

## Grace Glynn Testimony Notes – H.664 2/29/24

1. Introduction: State Botanist for VT Fish & Wildlife Department, background in field botany and ecology. I work on the mapping, monitoring, and conservation of ~600 rare and uncommon plant species in Vermont.
  - a. The mission of the VT F&W Dept. is the conservation of all species of fish, wildlife, and plants and their habitats for the people of Vermont. To support this mission, we maintain a database of all known occurrences of rare plants and animals in the state. Our database includes over 150 years of monitoring data and allows us to pick up on long-term population trends and identify which species are most imperiled and deserve conservation attention. Monitoring known populations and completing de novo rare species surveys across the state gives us a better understanding of the true rarity, distribution, and conservation needs of these species.
  - b. We also work to maintain and enhance ecological function across the landscape through the implementation of Vermont Conservation Design. VCD takes a course-filter approach to conservation: for example, conservation of a rich fen—which is a globally rare wetland natural community—will also conserve the numerous species that rely on this specific habitat type, from rare mosses to native pollinators. This approach to conservation can be thought of as “conserving the stage” for native biodiversity, even if we haven’t catalogued that diversity in its entirety.
2. What does this have to do with fungi?
  - a. Fungi are generally data-deficient: we just don’t have enough information about many fungal taxa to say with certainty what their rarity is. We also lack a comprehensive list of fungi for the state. This means that our coarse-filter conservation work at F&W is important in conserving fungal diversity in VT: when we conserve that rich fen, it’s likely that we’re automatically conserving an entire fungal community that’s under-researched and little understood. This fungal community probably includes arbuscular mycorrhizal fungi that live entirely underground—research suggests that some native wetland plants may rely on these mycorrhizal fungi to take up phosphorus, but these fungal communities have received little attention and I’m aware of no research on the topic in Vermont.
  - b. Data deficiency in fungi is problematic because it’s difficult to determine conservation strategies for specific fungi without a better understanding of their ecology, distribution, and trends. We need more people studying this hyperdiverse group, refining our understanding of the diversity of Vermont, and developing species monitoring programs. This bill has the potential to bring attention to the importance of research on data-deficient fungi and to generally increase awareness of fungal diversity and its role in larger ecosystems.
  - c. One brief example of how additional focus on the role of native fungi is crucial to native biodiversity conservation: Vermont supports over 50 species of native orchids, but many of them are in decline. For example, the elusive fairy slipper orchid was once common in Vermont’s cedar swamps but slowly began to



disappear in the 80's and hasn't been seen since 2001, when the last leaf was spotted in a cold swamp in the NE Kingdom. There are likely several factors at play, but we don't completely understand why these orchids are declining. One reason might be related to mycorrhizal fungi, upon which orchids are strongly dependent. In fact, orchid seeds are so tiny they look like flecks of dust—this is because these seeds and tiny germinating orchids rely entirely on nutrients delivered to them by soil-dwelling fungi. So, the distribution of certain orchids is likely shaped by the distribution of the fungal species that form relationships with them. This is an example of how the study of fungi is absolutely crucial to biodiversity conservation. We need more insight into how climate change is influencing soil fungi and how this is affecting native plant species in turn.

- d. There are scientists working to culture the fungi living on the roots of orchids across North America, particularly at the North American Orchid Conservation Center. One of our partners, Native Plant Trust, is working on banking genetic material for our most imperiled orchids, and we collaborate with them on selecting sites across Vermont for this week. However, we understand very little about how to propagate species that have complex relationships with fungi, and more research is needed.
3. Bear's head tooth from an ecological and biodiversity perspective
    - a. A common species (iNaturalist reports 335 observations across the state) found in northern hardwood forests (a matrix forest type in Vermont).
    - b. This bill is an opportunity to encourage appreciation for native biodiversity, which is increasingly important as we develop conservation strategies to halt biodiversity loss.
    - c. Beyond its value as an edible and medicinal species, bear's head tooth has inherent value as a part of Vermont's forests. It commonly grows on decaying American beech, demonstrating its connection to other native species and ecosystem processes. It's likely to be found alongside our state tree, in the same woods that support our state bird. Its designation as a state symbol will be a valuable reminder to consider how we can best protect native biodiversity and the habitat that bear's head tooth relies on to persist.