

BEVERLY RATHCKE

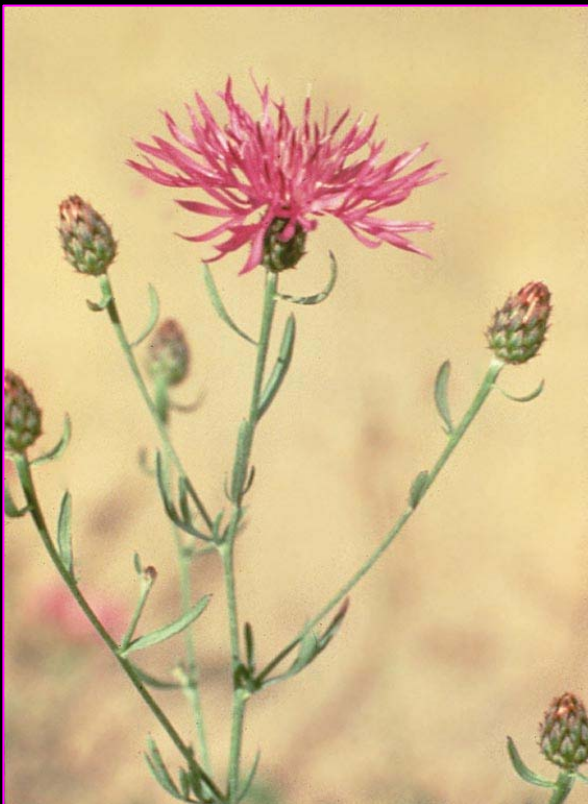
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My major research interests are in community ecology and plant-animal interactions. In my research I seek to understand how species coexist in diverse communities and how interactions, especially competition and mutualism, may determine species diversity and the evolution of traits in organisms. I currently have two major research areas: 1) pollination and plant reproductive biology, and 2) effects of herbivory on invasive and native plants.



POLLINATION ECOLOGY

I am studying several plant species, but one species, White Mangrove, is especially interesting because it has the rarest sexual system in the world—it is androdioecious—which means that populations have male plants and hermaphroditic plants. Only seven other plant species and one shrimp are known to be androdioecious. How can males persist when other plants can act as both males and females? In fact, many populations of White Mangrove in the Bahamas and Florida do not have males and are only hermaphroditic. What are the factors that allow males to persist? Pollinator behavior may be the key; pollinators must move between plants to allow males to father offspring. If pollinators tend to stay within plants, males lose out on mating opportunities while hermaphrodites are pollinated by self-pollen and produce fruit. I am asking similar questions of other species and my research involves field and lab work.



HERBIVORY AND INVASIVE PLANTS

Darwin suggested that invasive species may be so successful because they have left their enemies behind in their native land. I am testing his hypothesis for an invasive plant, spotted knapweed (*Centaurea maculosa*), that is one of the most noxious weeds in Michigan. This plant escapes herbivory here, but does this escape give it a competitive advantage over native plants that do not escape herbivory? Field experiments gave an unexpected result: native plants did better when herbivores were excluded but so did knapweed. Knapweed appears to be parasitic on native plants so when they grow larger, knapweed also grows larger. However, deer may facilitate the invasion of this species by keeping the native vegetation sparse so seedlings can grow. Field experiments are ongoing at the E.S. George Reserve west of Ann Arbor.