

Water chestnut biomass estimates using density as a proxy: Facilitating multiyear comparisons with a streamlined approach

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ABSTRACT

Water chestnut (*Trapa natans*) is an invasive macrophyte negatively impacting native aquatic communities in the United States. In New York state, water chestnut occurrence is monitored through iMapInvasives, a public database that includes several data fields for all records, such as distribution type (or categorical density). Biomass is not regularly recorded in iMapInvasives but is important as a secondary measurement to gauge primary production, nutrient uptake, and invasive impact. Lack of biomass data in iMapInvasives may be addressed with alternative methods of acquiring biomass information from records. The primary goal of this project was to develop methods that allow comparable biomass estimates to be made using a measured area and an observed distribution type in the iMapInvasives database. Nine locations were sampled for water chestnut in June and July 2021. Areas of sparse, dense, and monoculture growth were recorded along with trace points. Collected plants were cleaned, measured, and dried to obtain final dry biomass density values for each distribution type. Density values were highest in monoculture and lowest in sparse but also varied based on location and date. ANOVA testing indicated that plant density, rosette growth, and rosette width varied among distribution types. Our water chestnut measurements were used to create formulas that can estimate biomass using presence- and distribution-type data in iMapInvasives. These formulas may be useful for stakeholders and managers seeking to understand the invasive impact of water chestnut and assess its change in abundance over time.

Key words: iMapInvasives online database, invasive species, macrophyte management, monoculture, *Trapa natans*.

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