Abundance of Wigeongrass during Winter and Use by Herbivorous Waterbirds in a Texas Coastal Marsh

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Abstract: Aboveground vegetation of many species of submerged aquatic plants is an important food source for many species of waterbirds adapted to a diet high in fiber. Wigeongrass (*Ruppia maritima*), a submerged aquatic plant inhabiting estuarine wetlands, has been documented as an important winter food for waterbirds along the Texas Gulf Coast. Thus, we examined availability of wigeongrass at Mad Island Wildlife Management Area (MIWMA), Texas, by estimating aboveground biomass from October through January 1998–99 and 2001–02. We also used an exclosure experiment to determine the extent to which herbivory by waterbirds was responsible for depletion of wigeongrass. Aboveground biomass of wigeongrass varied between years, among months, and among months within each year (interaction term). Biomass of wigeongrasss declined an average of 189 g $m^{2\ -1}$ and 71 g $m^{2\ -1}$ between October and January each year. Aboveground biomass also was influenced by the effect of exclosures within month. Aboveground biomass declined at a higher rate among plots exposed to herbivory compared to exclosures, and the loss of biomass attributable to foraging by waterbirds was 19%. After an initial peak in November, counts of gadwalls (*Anas strepera*), American wigeons (*A. americana*), and American coots (*Fulica americana*) using ponds sampled for wigeongrass at MIWMA followed a declining trend similar to availability of wigeongrass during the first year of the study, suggesting that herbivorous waterbirds moved to other habitats where food was more available as wigeongrass was depleted. Our results indicated that other factors also reduced availability of wigeongrass as winter food for herbivorous waterbirds. Further, while forage may still be available, there is a threshold at which herbivorous waterbirds will abandon wigeongrass beds.

Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 62:234

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