GRADUATE STUDENT SPOTLIGHT

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Kirsten started fall 2018 and has completed her master's thesis defense in December 2020. Kirsten's research is focused on examining wild celery abundance and distribution in the Upper Mississippi River.

Wild Celery on the Mississippi River
Project Overview:

Wild celery is a critical source of food for migrating waterfowl due to its high energy content and availability during peak migration. Metabolically, canvasbacks need to eat at least 201 kcal/day, but daily caloric requirement is assumed to be about twice that of metabolic needs. Canvasbacks need 400 kcal/day, the equivalent of 125g of wild celery buds. Canvasbacks are recognized as a bird of conservation concern by the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service, 2015). In order to sustain canvasbacks and other waterfowl, manager must provide them with a consistent source of wild celery winter buds during and throughout their migration.

Given its importance as a food source and implications for monitoring river hearth, since 1998, aquatic vegetation has been monitored by the Long Term Resource Monitoring (LTRM) element of the Upper Mississippi River Restoration Program (U.S. Army Corps of Engineers, 2015 and Johnson and Hagerty, 2008). Presence and relative abundance data are collected on an annual basis in pools 4, 8, and 13 by the LTRM. Relative abundance data is used to predict the distribution of submersed aquatic vegetation and provides valuable information to scientists and managers (Yin et al. 2000). However, there remains questions on how data collected by the LTRM is related to waterfowl habitat quality and bioenergetics. Given the long-term data collection from the LTRM projects, Kirsten's study aimed to determine if there is a statistical relationship between LTRM rake scores and winter bud biomass estimates from core samples. If a consistent and reliable relationship exists, then manager will have the capacity to predict the energetic carrying capacity from winter buds for canvasbacks by just using LTRM data. This information can help managers make decisions for restoration projects and other factors affecting waterfowl and their habitats on the Upper Mississippi River. Kirsten's study objectives are:

1. Determine if there is a relationship between LTRM wild celery data collected in the summer and wild celery winter bud data collected in the fall.
2. Determine if the amount of wild celery winter bud food resources left after the fall migration is over, and just prior to the start of the spring migration, differs between areas that are open to hunting in the fall and areas that are closed to hunting.
3. Estimate the kilocalories of energy provided by wild celery winter buds at the start of the fall migration and again at the start of the spring migration, in the areas of pools 4, 8, and 13 that were sampled.
4. Spatially map the distribution of wild celery winter buds in the areas of pools 4, 8, and 13 that were sampled.