Konza Prairie Researcher Awarded National Science Foundation Pre-Doctoral Fellowship

Kimberly Komatsu from Yale University has been awarded three years of support from the National Science Foundation. The National Science Foundation aims to ensure the vitality of the human resource base of science, technology, engineering, and mathematics in the United States and to reinforce its diversity by offering approximately 1,000 graduate fellowships through the Graduate Research Fellowship Program. Kim is a Ph.D. student in Dr. Melinda Smith's lab from Yale University and the title of her project is "The effects of top-down and bottom-up forces and their interactions on woody encroachment into the Great Plains".

Woody encroachment is a major threat to the grasslands of the Great Plains. Thus, it is important to understand the underlying causes of woody encroachment. Much of the research on woody encroachment has focused on disturbance, mainly in the form of fire or grazing. However, woody encroachment may be a consequence of several interacting factors, such as an alteration of competitive interactions caused by increased nutrient availability (bottom-up control) and changes in consumer abundance (top-down control). Separately, top-down and bottom-up effects on plant communities have been studied extensively, but no empirical studies have co-manipulated top-down and bottom-up forces to determine their interactive effects on woody encroachment across multiple systems. The goal of my proposed research is to experimentally assess the relative importance of bottom-up (resource availability) and top-down (herbivore impact) factors and their interactions on woody plant encroachment of grassland systems. This work will be conducted across three study sites spanning the natural east-west precipitation and diversity gradient of the central Great Plains, with sites in shortgrass steppe (Shortgrass LTER, CO; SGS), mixed grass prairie (Saline Experimental Range, western KS; SER), and tallgrass prairie (Konza LTER, northeastern KS; KNZ). This novel study will provide important insights into how top-down and bottom-up controls are affecting woody encroachment in grasslands spanning a broad resource gradient.

The Graduate Research Fellowship provides three years of support for graduate study leading to research-based master's or doctoral degrees and is intended for students who are at the early stages of their graduate study. NSF Fellows are expected to become knowledge experts who can contribute significantly to research, teaching, and innovations in science and engineering. These individuals will be crucial to maintaining and advancing the nation's technological infrastructure and national security as well as contributing to the economic wellbeing of society at large.

For more information about this project contact Kimberly at kimberly.komatsu@yale.edu