

Kristin Millenbach

Department of Wildlife & Fisheries

Description of the student's proposed research, emphasizing how it will address a water resources-related concern.

My research will focus on the spatial and behavioral ecology of the whooping crane (*Grus americana*) on the wintering grounds at Aransas National Wildlife Refuge. My research will be in conjunction with a larger research project that will assess the impact of freshwater inflows from the Guadalupe River and the community dynamics of the marsh on the population of whooping cranes. The San Antonio River Authority, San Antonio Water System, and the Guadalupe Blanco River Authority, who have agreed to develop alternative source of water for the San Antonio region, are funding the project. These agencies have proposed the Lower Guadalupe Water Supply Project, which is a part of the proposed State Water Plan, approved in July 2001 by the Texas Water Development Board. This proposed project would divert surface water from the confluence of the San Antonio and Guadalupe Rivers, to be delivered to a treatment facility near San Antonio. It is important to find the balance between human water demands and critical inflows to estuaries, which led to the funding of the project to link freshwater inflows to marsh community dynamics and whooping cranes.

The primary objective of my thesis research is to examine the spatial use of territories by crane families. Whooping cranes are territorial on the wintering grounds, which is somewhat rare among most bird species, which are more commonly territorial on the breeding grounds only. I am interested in looking at how they utilize the territories, and how their habitat use changes spatially and temporally. Whooping cranes rely on blue crabs for the bulk of their winter food, and each territory borders the Gulf Intracoastal Waterway. Blue crabs enter the marsh from the Gulf of Mexico, where maturation occurs, and the influx of crabs is dependent on the water through which they move into the marsh. The availability of blue crabs to the whooping cranes is important to the survival of the cranes and potentially their reproductive success at their breeding grounds in Canada. One objective of the larger research project is to relate the freshwater inflows to the movement of blue crabs into the marsh, which is an essential step in assessing the quality of the marsh habitat for the whooping cranes.

The second objective of my research is to assess the behavioral response of cranes to human disturbance. I plan to observe the cranes' response to tourboats that frequently enter the Gulf Intracoastal Waterway in order to allow tourists to see whooping cranes. There are several tour companies based in Rockport, Texas, that charter whooping crane tours typically every day during the duration of the winter season. I am interested in seeing how the cranes respond to the boat disturbance, and if so, how they are affected and where they move. Human disturbance can result in reduced food intake and increased energy expenditure if the birds flush. I am hoping to compare the habitat types and food availability of the area where the cranes were to the area where the cranes move in response to boat disturbance.

This project is closely linked to water resources issues in Texas. The growing population of Texas will mean increasing pressure on water resources, which will also cause greater pressure to be placed on water resource agencies to supply water for human needs. It would seem easy to divert as much water as possible without regard for estuary inflows, but in the long run the environmental impacts of water diversion must be examined. This project is unique, in that it will be examining many different aspects of the marsh community in Aransas National Wildlife Refuge, from water to plants, to blue crabs, to whooping cranes. The results of this project will help set minimum inflows for the estuary, and contribute directly to the management of water resources in the state of Texas.

Proposed use of funds resulting from this Scholarship (for example, to pay tuition, conduct research, etc.).

If awarded the scholarship, I would use the funds to aid in the purchase of a range-finder with a GPS unit. This instrument can be used to obtain the exact location of an object from a distance. By obtaining the location of the cranes with this instrument, I would then overlay their location onto a GIS map of habitat types. The purchase of this instrument would be invaluable to me for assessing the spatial use of habitat, as well as providing a way of observing how much time they spend foraging in areas with high crab abundance. The award would also be beneficial for paying tuition fees.

Intended career path the student anticipates pursuing.

I am interested in pursuing a career involving the conservation of wildlife and habitat. In the U.S., I would be interested in working for wetland conservation, because of the dwindling amount of undeveloped wetlands, which are essential to many migratory birds. I am also hoping to work internationally at some point, possibly for a non-governmental organization. I am interested in working wherever I can have the greatest impact on the conservation field, not limiting myself to a certain type of habitat or organism.