Investigating the Potential of Knotgrass as Food for Migratory Birds

Article and photos by **DR. RYAN O'SHAUGHNESSY** and **MARIBEL GLASS,** *Borderlands Research Institute*

Homogenous stand of knotgrass within a moist-soil wetland unit at Bosque del Apache NWR.

Across the continent, wildlife managers direct significant resources toward producing habitat and food for migrating waterfowl and shorebirds.

One of the most common management practices is that of moist-soil units. These are managed wetland units, generally ranging in size from one to 20 acres, which are sequentially flooded during fall and allowed to dry during late spring. This flooding and drying process rejuvenates seed production each cycle, resulting in seed biomass estimates of thousands of pounds per acre.

One such managed wetland unit complex is the Bosque del Apache National Wildlife Refuge in central New Mexico. The refuge painstakingly manages a series of controlled wetlands across approximately 3,800 acres of Rio Grande floodplain. These managed wetland units provide food to tens of thousands of migrating birds during fall and spring. Recently the United States Fish and Wildlife Service enlisted the help of the Borderlands Research Institute to investigate the effects of invasive knotgrass in these wetland units.

Biologists have noticed an increase of knotgrass in the wetland units over the years.

"We really have no idea if the increase of knotgrass is a good or bad thing," said BRI Graduate Student Maribel Glass. "If the thousands of Sandhill Cranes, Snow Geese, and ducks are eating knotgrass, then there's not much to worry about. But if the knotgrass reduces diversity of foods available, and is not preferred by the birds, then we have to come up with a solution."

To address these questions, BRI will be collecting roughly 150 core samples from the wetlands and determining the proportion of knotgrass seeds in each sample. The seeds in each core sample will be dried and weighed to determine production value.

The data from each core sample will then be extrapolated across each wetland unit to estimate total production of knotgrass within the unit. Finally, these estimates will be converted into a duck-use-day metric, allowing refuge managers to determine how many waterfowl can be supported over a period of time across the refuge.

Knotgrass seeds (yellow) and cocklebur (spiny) collected from core sample taken from Bosque del Apache NWR.

Importantly, the question still remains if the waterfowl and shorebirds are actually eating the knotgrass. To address this question, Glass will conduct bird surveys across the wetland units to determine the amount of use each unit is actually receiving from waterfowl and shorebirds. This data will allow managers to determine if wetlands dominated by knotgrass are receiving less, equal or more use than units not dominated by knotgrass.

Lastly, and perhaps most tellingly, a variety of birds will be collected from across the refuge. These bird samples will undergo necropsy to determine if any of the species have specifically been feeding on knotgrass seeds. The bird guilds to be collected will range from ground dwellers to waterfowl; Pintails, Snow Geese, Sandhill Cranes, Ring-necked Pheasants, Gambel's Quail, and Killdeer will be collected.

The crops (when present) and gizzards will be removed from the birds and stored in formalin until the samples can be returned to the laboratory at Sul Ross State University in Alpine. Once in the lab, all of the seeds will be removed from the crops and gizzards and examined to determine if knotgrass was consumed.

The study's results will directly address some of the questions the refuge has regarding the spread of knotgrass in the wetlands. These results will also be applicable more broadly across the continent, as additional areas have also reported an increase in knotgrass within managed wetlands.

If knotgrass is found to be useful, managers may choose to continue current management techniques to propagate the spread of knotgrass. Alternatively, if knotgrass appears to be reducing wetland quality in terms of bird use, managers may have to modify management techniques in an effort to stop the spread of the grass.