FINAL PERFORMANCE REPORT
South Carolina State Wildlife Grant T-19-R-1
Habitat Enhancement on North and South Williman Islands, Beaufort County, SC
October 1, 2006 – September 30, 2010

GRANT OBJECTIVES

Improve and increase the diversity of habitat on the Williman Islands by developing and implementing various management strategies (e.g. burning, plot clear-cutting, mowing, disking, native grass establishment, rotational plot management for variable plant succession, control of non-native species, etc.) and monitor population responses of birds, mammals and possibly other fauna identified as priority species in the South Carolina Comprehensive Wildlife Conservation Strategy, 2005-2010.

ACTIVITY OVERVIEW:

Activities associated with the grant are described below, according to the original tasks and subtasks in the Project Statement for this grant.

Tasks
I. Habitat enhancement

Activity: The initial habitat enhancement focused on the removal of a large herd (~100 animals) of feral goat (*Capra hircus*) on North Williman Island that predated South Carolina Department of Natural Resource (SCDNR) ownership of the marsh island. These animals had severely over-browsed native plant communities over nearly 500 acres of North Williman Island. This initial objective was completed in January 2008.

A second primary objective was to attempt to eradicate or substantially reduce a broadly distributed population of the highly invasive Chinese tallowtree on several hammocks (small islands) within North Williman Island (North Williman Island encompasses both tidal marshland and nine islands or hammocks). Chinese tallowtree was particularly abundant in isolated wetlands on the largest, ~430-acre, North Williman Island hammock prior to the initiation of this project. This previously unnamed hammock was named "Goat Island" because of the severe adverse impacts the animals had made on native plant communities. Herbicide injection of Chinese tallowtrees was completed on six North Williman Island hammocks in November and December 2007. Eradication efforts for adult Chinese tallowtrees were considered highly successful.

Another initiative was undertaken in late winter and early spring 2008 to establish colonies of sweetgrass (*Muhlenbergia sericea*) in peripheral grassland areas of "Goat Island". Habitat complexity and structure on the outer upland slope near the upland to tidal marsh ecotone had been greatly diminished from over-browsing by feral goats. The establishment of sweetgrass colonies was undertaken to restore cover and production of grass seeds as a potential food-source for birds. An evaluation of sweetgrass plots was performed in late 2009. Overall survival was 317 (74.9%) of 423 seedlings distributed over 12 sites, and multiple plants survived at all sites,

thereby providing for the probable long-term establishment of grassy cover and seed production at all sites.

Nesting boxes for wood duck (*Aix sponsa*) were erected at selected isolated wetlands on South Williman Island and at the largest isolated wetland on "Goat Island" in February 2008. Prior to this project, there was no confirmation of nesting by wood duck on any portion of South Williman Island or North Williman Island. Seven nesting boxes, one each at seven isolated wetlands, were placed on "Big South Williman Island", the largest, nearly 640-acre hammock within South Williman Island. Two boxes were placed at the largest, ~3-acre isolated wetland on "Goat Island", and at opposite ends of the wetland. This task was completed in February 2008, and all boxes were checked each spring, 2008-2010. Boxes were cleaned after each nesting season in preparation for the following nesting season. At least one box produced a brood of wood ducks each spring, and six of nine boxes produced wood duck broods in 2010. This task was considered as highly successful, and these boxes may provide suitable nesting habitat for wood duck and other species for many years.

Five sentinel plant plots were established on "Goat Island" in fall 2007 with the assistance of Dr. Joel Gramling of The Citadel to monitor recovery of natural plant communities following the removal of feral goats and the herbicide treatment of invasive Chinese tallowtree. Initial quantitative inventories were conducted for all sentinel plots in February-March 2008. Additionally, four sentinel plant plots for quantitative plant community evaluation were established on South Williman Island under the leadership of Dr. Joel Gramling in June 2007. All such sentinel plant plots were established within relatively homogeneous plant communities are best-suited for monitoring of long-term changes in plant communities and for plant community characterization. Also, "armadillo exclosures" constructed of wire fencing, each enclosing a 100 square meter area, were erected in March-April 2008 and directly adjacent to three of the five "Goat Island" plant plots to potentially provide information on possible impacts on plant communities by foraging and burrowing by nine-banded armadillo. A graduate student enrolled at The Citadel in 2008 was to assume this portion of the project as a thesis topic, but the student dropped out of school and was not replaced. Accordingly, intensive assessment of this activity was preempted. Observations to date show very slow succession of plant communities within plots and regardless of the exclusion of nine-banded armadillo. A rather rapid positive response of native plants was observed in isolated wetlands in which adult Chinese tallowtrees were eradicated. Plant plots provide for potential further assessment of plant community recovery for many years beyond the close of this project..

Sixteen sentinel photographic sites were established on "Goat Island" in 2006 with hopes of documenting the recovery of native plants in response to the potential removal of feral goats and possibly in response to the removal of Chinese Tallow-tree. Three additional sentinel photographic sites were established on "Goat Island" in 2008. Sentinel photo sites have been visited repeatedly since there establishment, and photos were taken at all sites each spring and fall. Assessments for plant community changes at photo sites are largely subjective. Through September 2010, responses of plant communities on "Goat Island" to habitat management activities have been relatively subtle, though gradual recovery of all native plant communities has been observed. Photos taken periodically at two isolated wetland sites show dramatic

responses of native plant communities following eradication and removal of Chinese tallowtree and removal of feral goats.

Additional potential habitat management and enhancement activities were not performed Activities such as forest thinning and clearing on "Goat Island" would require a commitment of many years of habitat management that could only be assured under long-term funding. Without follow-up management for a decade or longer, both thinned areas and cleared areas would likely re-colonize with dense stands of loblolly pine and Chinese tallowtree. After consideration of limitations to the necessary long-term commitment to habitat management goals, timbering was removed from consideration unless long-term funds are made available.

Significant deviations: None. However, potential habitat management and manipulation activities dependent upon a decade or longer of focused activity to obtain goals were removed from consideration (see above). Also, additional funds were received through a Cooperative Grant from Fish and Wildlife Service, United States Department of the Interior (August 2008 – June 2010) to sponsor additional habitat restoration and enhancement actions on "Goat Island" in order to compliment the progress made by this project. The primary goals were the eradication of seedling and sapling Chinese tallowtrees produced by seeds that germinated following the eradication of thousands of adult Chinese tallowtrees during this project and the damming of drainage ditches at several isolated wetlands on "Goat Island". Seedling and sapling Chinese tallowtrees were hand-pulled or sprayed with an appropriate herbicide. Also, standing dead Chinese tallowtrees that had been killed by herbicide injection as part of this project were removed from several isolated wetlands with dense stands of dead trees. Dead trees were cut and hand-carried from wetlands, and woody debris was placed in piles to produce cover for wildlife. Responses of plant communities and wildlife to habitat enhancement and restoration activities on "Goat Island" could not generally be attributed to any specific action taken under this project or the complementary actions taken under of the aforementioned Cooperative Project. Survey and monitoring observations used to assess wildlife responses extended throughout both project periods.

II. Survey and monitoring

Activity: One hundred and eleven trips were made to "Goat Island" from October 2006 through September 2010. Observations of fauna were recorded for 97 of these trips, but the remaining 14 trips were intensely task-driven with no noteworthy observations having been made. The project leader was present on all trips and was typically looking and listening for wildlife. Special attention was given to recording breeding bird (land birds and wadingbirds) activity during trips made from spring through summer. .

Observations of wildlife and of responses of plant communities and habitats following habitat enhancement and restoration activities and made through September 2010 were evaluated and compared with observations from 20 by-foot survey trips by the author to "Goat Island" from 1 September 2004 through 14 July 2006. Prior to fall 2006, no habitat enhancement and restoration actions had been undertaken on "Goat Island" or other North Williman Island hammocks since the parcel was acquired by, and placed under the management of, the SCDNR in 1999.

Fifteen trips were made to South Williman Island during the project period. However, no habitat management actions were taken on South Williman Island other than the placement of seven wood duck boxes. Although observations related to responses of wildlife to habitat management were not appropriate for South Williman Island, observations of fauna were recorded for each trip thereto. Data were recorded for all fauna observed during all survey trips. These data will be used to establish baseline information for future evaluation of potential changes in faunal populations from possible future habitat management actions.

Evaluations of responses of specific conservation priority wildlife species are presented in the attached report.

Significant deviations: None

Federal Cost (grant level): $20,000; all funds have been expended.

Recommendations: Close grant