ECOLOGICAL STUDIES OF WILLOW (*SALIX CAROLINIANA*): MONTHLY STATUS REPORT #17

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Covering the time period from June 1-30, 2010

This status report summarizes progress made on the Ecological Studies of Willow project through June 30, 2010, with reference to the tasks and timeline outlined in the Scope of Work and presented in Table 1 below.

Table 1. Timeline of tasks to be accomplished in Year 2. Tasks initiated and underway in this reporting month are highlighted in blue, completed tasks in red.

YEAR 2

Quarter	Months	Tasks accomplished
1st	Oct – Dec, 2009	Initiate Task 2.3 (*Fire response*) Continue Task 2.4 (*Life history*) Continue Task 2.5 (*Spatial analysis of willow distribution*)
2nd	Jan – Mar, 2010	Continue Task 2.3 (*Fire response*) Continue Task 2.4 (*Life history*) Continue Task 2.5 (*Spatial analysis of willow distribution*)
3rd	Apr – Jun, 2010	Initiate Task 2.2 (2nd iteration, *Willow transplantation*) Continue Task 2.3 (*Fire response*) Continue Task 2.4 (*Life history*) Continue Task 2.5 (*Spatial analysis of willow distribution*)
4th	Jul – Sep, 2010	Complete Task 2.2 (2nd iteration, *Willow transplantation*) Continue Task 2.3 (*Fire response*) Continue Task 2.4 (*Life history*) Continue Task 2.5 (*Spatial analysis of willow distribution*) Complete Task 3.2 (*Data analysis and final report, Year 2*)

Progress on Task 2.1 – Germination and Early Survival and Growth Experiments
This task was completed in April, 2010. Luz M. Castro-Morales presented a poster on this work to the Society of Wetlands Scientists meeting in Salt Lake City, June 27-July 2, 2010. The poster abstract is reproduced on the next page, from http://www.sws.org/2010_meeting/docs/SWS0093.pdf. The whole poster can be retrieved at: http://biology.ucf.edu/~pascencio/willow%20research.html

Progress on Task 2.2 – Willow Transplantation
A. Competition Experiment – We continued to maintain the flooding and competition experiments. (We recorded survival and growth of sawgrass and willows on July 9, 2010.) We will summarize these data in the next monthly report.

B. Hydrology Experiment – We completed analysis of this experiment and are continuing to prepare a manuscript for publication.

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GERMINATION AND EARLY SURVIVAL OF CAROLINA WILLOW (SALIX CAROLINIANA)

Appropriate knowledge about the ecology of invasive species is essential to manage and conserve wetlands. Salix caroliniana dominates large areas of the Upper St. Johns River, Florida. We conducted experiments evaluating the effects of water availability and substrate type on germination, and seedling survival of S. caroliniana to contribute to the understanding of the environmental conditions that promote its spread. In the first experiment, we used commercial pot soil and six different water treatments: Continuous flooding, soil continuously kept moist by capillarity, watered daily, watered once every 3 days, 5 days, and 8 days. Samples were placed in a growth chamber to control the temperature and light regime. Germination and survival of S. caroliniana was highest under the capillarity treatment; mortality increased as water availability decreased. In the second experiment, we used the capillarity treatment and six soil types. We collected soils at different sites of Southeast Florida: Blue Cypress Marsh (BC) and River Lakes (RL) are peaty soils, and St. Johns (SJ) is a sandy soil. Pots were filled with BC soil, RL soil, SJ soil, BC/RL soil mix, BC/SJ soil mix, or RL/SJ soil mix. Our data did not provide evidence of differences among soils types or combinations in germination or early survival of S. caroliniana. These experiments suggest that water availability is more critical than soil types for germination and early survival of this willow species. Therefore, allowing higher variations in water levels might decrease the survival of willows in their initial stages and control their propagation.

Initiate Task 2.3 - Fire response

We continued to maintain 170 pots of willow seedlings and 700 willow cuttings for this experiment.

Progress on Task 2.4 - Life History

We modified our protocol to identify sampling sites using a deterministic protocol instead of using randomly selected points. We made this change because randomly selected sites proved nearly impossible to access.

We are sampling willows in the north, central and southern regions of the Upper St. Johns River Basin, and within each region, choosing sites with willows 1) along rivers or canals; 2) along roads or levees; 3) in isolated willow swamps or thickets; and 4) in areas where willow is invading open, herbaceous marsh. At each of these twelve sites, we are sampling five focal willows, for a total sample size of 60 individuals.

During this reporting period, we sampled willows along roads in the northern, central and southern regions. At each site, we recorded key demographic parameters of five individual willows of varying sizes and any additional willows within a 1 m radius. We took trunk samples or cores from each focal willow for dendrochronology, and marked one individual per site for re-assessment of growth rings next year, to verify that growth rings represent annual growth increments. Combined with demographic plots sampled

last year, we have completed 50% of our life history sampling. We expect to finish it this summer.

Progress on Task 2.5 – Spatial Analysis of Willow Distribution.

We began modifying our existing spatial model to incorporate vulnerability of adjacent communities to willow invasion. For example, open herbaceous marsh is modeled as susceptible to willow invasion while oak hammock and other upland vegetation assemblages are modeled as resistant. We also began organizing our sampling of 100 randomly-selected points to refine and test the model.

Summary of Activity

During this reporting period, the UCF team maintained seedlings and cuttings for eventual use in the fire experiment; maintained the flooding and competition experiments; sampled 1/3rd of the life-history plots and began modifying the GIS model.