

ECOLOGICAL STUDIES OF WILLOW (*SALIX CAROLINIANA*):
MONTHLY STATUS REPORT #13



Paddling to one of the willow islands on an unusually cold February morning

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Ecological Studies of Willow (*Salix caroliniana*):
Monthly Status Report #13

Covering the time period from February 1-28, 2010

This status report summarizes progress made on the Ecological Studies of Willow project through February 28, 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 (<i>Fire response</i>) Continue Task 2.4 (<i>Life history</i>) Continue Task 2.5 (<i>Spatial analysis of willow distribution</i>)
2nd	Jan – Mar, 2010	Continue Task 2.3 (<i>Fire response</i>) Continue Task 2.4 (<i>Life history</i>) Continue Task 2.5 (<i>Spatial analysis of willow distribution</i>)
3rd	Apr – Jun, 2010	Initiate Task 2.2 (2nd iteration, <i>Willow transplantation</i>) Continue Task 2.3 (<i>Fire response</i>) Continue Task 2.4 (<i>Life history</i>) Continue Task 2.5 (<i>Spatial analysis of willow distribution</i>)
4th	Jul – Sep, 2010	Complete Task 2.2 (2nd iteration, <i>Willow transplantation</i>) Continue Task 2.3 (<i>Fire response</i>) Continue Task 2.4 (<i>Life history</i>) Continue Task 2.5 (<i>Spatial analysis of willow distribution</i>) Complete Task 3.2 (<i>Data analysis and final report, Year 2</i>)

Progress on Task 2.1 – Germination and Early Survival and Growth Experiments

In February, willow cuttings rooted in the laboratory and we began potting them into 4” (10 cm) diameter pots filled with commercial, organic potting soil. We potted approximately ~300 cuttings on February 22 and another ~700 cuttings on March 1, for a total of >1,000 cuttings available for the fire, competition, flooding, and other experiments.

Only a few willows set seed in the Upper St. Johns River basin in February. We therefore collected seed beginning in the next reporting period, March, 2010.

Progress on Task 2.2 – Willow Transplantation

A. Competition Experiment – Because willows had not yet set seed, we allowed this experiment to remain intact through February. We are scheduled to terminate it in two days, on March 18, 2010.

B. Hydrology Experiment – We disassembled the hydrology experiment on February 13, 2010 (Figure 1 and cover photo). We measured the basal diameter and height of willow plants and counted the number of branches, leaves, and flowers. Only a small fraction of transplanted cuttings had flowered and none had set fruit. No seedlings had flowered. Dr. Betsy Boughton also identified the other, non-experimental plants that had colonized the islands.

We then clipped willow seedlings and cuttings into small sections, placed them into labeled paper bags and returned them to the laboratory. We dried plants at 60E C for ≥ 24 h and then weighed them to estimate dry biomass.

Preliminary analyses of the hydrology experiment will be included in the March report.



Figure 1. Collecting data on experimental willow seedlings and cuttings before disassembling the hydrology experiment.

Initiate Task 2.3 - Fire response

With help from District staff and graduate students in the Restoration Ecology class, we located the last block of the fire experiment within Blue Cypress Marsh Conservation Area (Fig. 2) on February 22, 2010. We counted, measured, and sexed all willow plants within a 5 m diameter circle, and randomly selected one-half to be burned and one-half to remain as unburned controls in the BACI (Before-After/Control-Impacted) design.

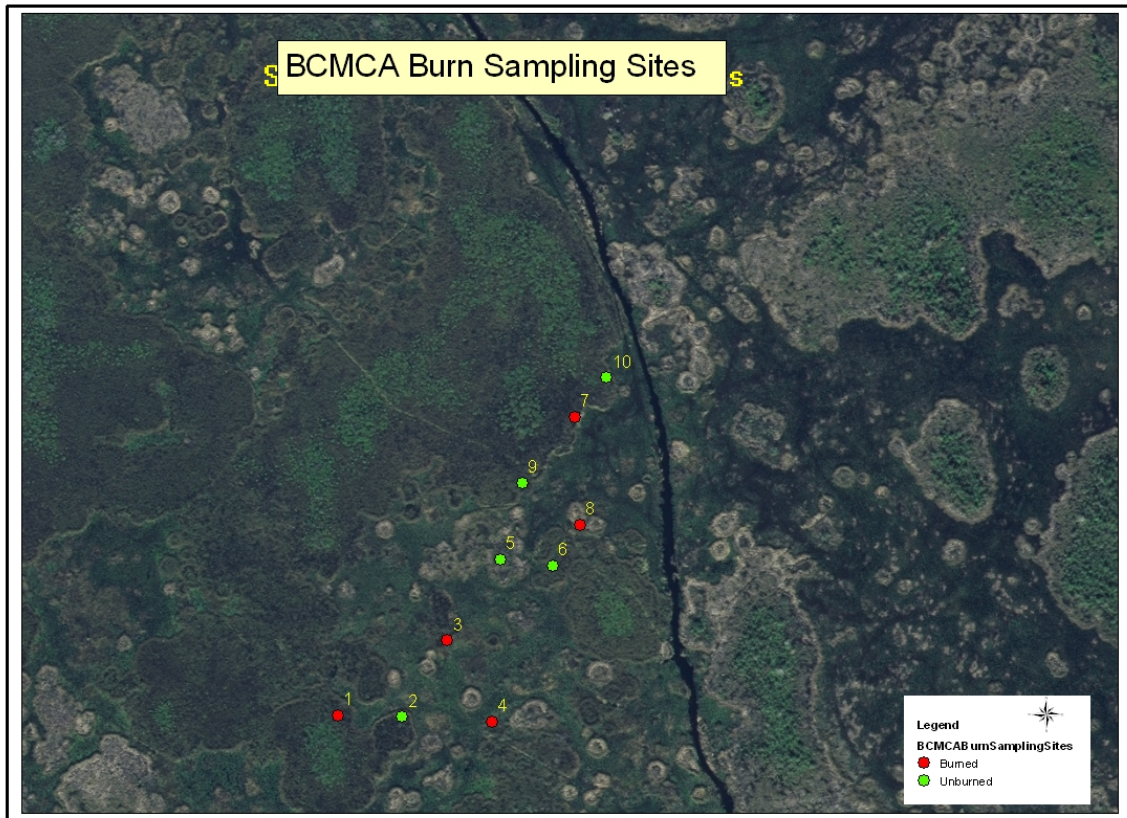


Figure 2. Locations of fire plots within Blue Cypress Marsh Conservation Area. Image created by Kimberli Ponzio, SJRWMD.

Progress on Task 2.4 - Life History

We gathered life history data, including basal diameter, height, numbers of branches, leaves and flowers, and gender, on willows located within the fire experiment. We also counted and measured annular rings of adult willows sampled last September. Annual growth rings were very apparent and the number of rings correlated closely with basal diameter (Figure 3; $R^2 = 0.90$, $F_{1,9} = 10.38$, $P < 0.0001$). If this result holds across willow size ranges and habitats, it will be possible to estimate the age of willow stands from their basal diameters.

Progress on Task 2.5 – Spatial Analysis of Willow Distribution.

We did not modify our existing spatial model during this period.

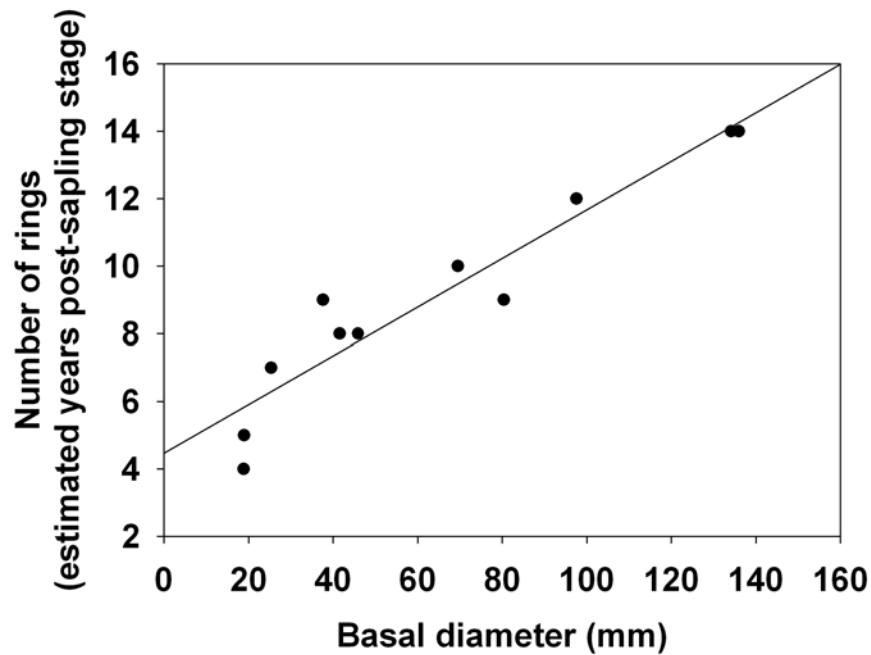


Figure 3. Number of rings as a function of basal diameter of willow trees sampled along the St. Johns River, south of U.S. 192. Trees were sampled in September, 2009, so individuals were at least 4-14 years old.

Summary of Activity

During this reporting period, the UCF team potted cuttings for use in field and laboratory experiments; completed preparations for the fire experiment; disassembled the hydrology experiment; and collected data on willow life history – including analysis of growth rings.