

# Woody Species for Adaptation in Louisiana's Marshes

## Status Report

By  
Richard Neill<sup>1</sup>, Garret Thomassie<sup>2</sup>

<sup>1</sup>USDA Natural Resources Conservation Service, 438 Airport Road, Galliano, LA 70354; <sup>2</sup>USDA Natural Resources Conservation Service, 438 Airport Road, Galliano, LA 70354;

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Dean Blanchard  
Senior Scientist  
Barataria-Terrebonne National Estuary Program  
Nichols State University  
P.O. Box 2663  
Thibodaux, LA 70310

## **Status Report 07-02-07**

### **Project Title**

Woody Species for Adaptation in Louisiana's Marshes

### **Project Description**

This is a three year cooperative agreement that began in 2001 between BTNEP and NRCS to identify native woody plant species suitable for coastal restoration and remediation activities. Phase II of the project is a continuation of the project. The focus is to identify native tree and shrub species that can be successfully planted and established on terrestrial areas of coastal Louisiana which will provide habitat for migratory avian species and stabilize vital habitat.

Summary of the species selected, planting sites (with modifications), and data collected can be found in Status Report dated March 2, 2005 authored by Fine, Thomassie and Edwards.

### **Tasks and Milestones Accomplished**

Task 1-Monitoring performance and adaptation of woody plant materials at each field planting site

Second Year Monitoring:

LUMCON FEP (Date monitored 3-06-06) Blocks 1 and 2 covered by salt water from hurricanes Katrina and Rita. Debris from high water was noted on study trees. See Attachment A for evaluation data.

Survival and growth on this site will be monitored in the third quarter of FY 07

Barataria Waterway Site 1. (Date monitored 03-07-06) Site was affected by hurricanes Katrina and Rita. High water covered site with debris covering the area. See attachment B for evaluation data

Data from this site were collected on 6-27-07 (see attachments)

Trinity Island (Date monitored 5-23-06) All four sites were affected from hurricanes Katrina and Rita. Only four Sweet Acacia were found growing. Site four was covered with dredge coming from an access canal near the site. It appears that the canal filled during the storms and was re-dug. The remaining plants were evaluated the height, spread and general vigor. See Attachment C for evaluation.

This site will be monitored in the third quarter of FY 07

Port Fourchon Sites two, five, and eight (Date 5-24-06) Plants had been overtopped by hurricane surge. The remaining plants were evaluated for overall height, spread, and general vigor. See Attachment D for evaluation.

This site was monitored on 5-24-07 (see attached data)

Grand Isle Sites: The Grand Isle sites were completely inundated for several weeks after Hurricane Katrina. The sites have been mowed. Data were collected on 6-12-07 in hopes that there may have been some survival.

From other sites we have indications that top pruning has enhanced survival, Mowing might have acted as a top pruning on this site.

**Tasks Accomplished with Explanation of:**

Task 1: Monitor adaptation and performance of woody species...

1. Problems Encountered: While the sites supported the plants with different vigor or success, the hurricanes destroyed most of the vegetation. Those remaining stems have been measured but data are no longer sufficient for statistical analysis.

Drought through the winter of 2005 and spring of 2006 further killed or weakened many of the plants that might have withstood inundation by salt water.

The winter of 2006-07 was not severe, and there was approximately normal rainfall, however the spring again was droughty.

2. Remedial Action Taken or Planned: We have begun planting the ridge project with hardwoods to obtain better information on the problems in establishing hardwoods on new sites. It appears that woody plants need to have some other vegetation previously established before planting. Additionally, trees coming from a nursery do not have root mass and top in proportion to those plants that establish themselves naturally. Please see "other discussions of special note" for further suggestions to investigate woody plant establishment.

3. Whether Minimum Criteria for Measure Can Still be Met:

The requirements of this project have been met within the constraints of the environment. The harsh weather did seem to destroy many of the plantings, but further monitoring will likely show us better means to deal with the unpredictable.

4. Likely Impact upon Achievement: The problems encountered have damaged chances of reaching all the goals desired at the onset of this project. The setbacks however should point to more effective means of establishing woody plants in the Louisiana marshes. (See Discussions of Special Note below)

Task 2 Establish seed tree nursery

**Tasks Accomplished with explanation of:**

1. Problems encountered: The soils at the Golden Meadow PMC have proven unsuitable for vigorous growth of the species selected.
2. Remedial action taken or planned: For the present appropriate seed sources from coastal areas have been identified. New arrangements are taking shape with Nicholls State University which should allow planting of identified seed sources in the Thibodeaux area.
3. Whether minimum criteria can still be met: The criteria will be met. It must be understood that seed orchards for perennial woody species take more than 10 years to establish.
4. Likely impact upon achievement: No impact is anticipated since plantings for the next 10 years will be from wild seed sources.

Task 3. Establish Demonstration plantings sites...

**Tasks Accomplished with explanation of:**

1. Problems encountered: Plantings were made and evaluations of plantings accomplished. Hurricane damage and drought will limit the value of data collected.

2. Remedial action taken or planned: Further plantings have been made and are being followed. Observational monitoring of sites is giving us information on what combination of environmental factors will give future plantings a greater chance for success
3. Whether minimum criteria can still be met: The minimum criteria have been met.
4. Likely impact upon achievement: Useful information has been gained. The full purpose of this project as conceived has been altered by environmental circumstances.

## **Deliverables**

This report and these data on the various sites serve as the deliverable for this reporting period.

## **Other Discussions of Special Note**

The combination of hurricanes and severe drought might be considered a worst case scenario, but it also offers an opportunity. From the outplantings we have an outdoor example of how different species react to salt inundation and drought. Observations of micro habitats in the plantings present us a chance to determine what combinations of terrain, soil, and moisture regimes are best suited to early establishment of woody plants in the marsh environment.

The purpose of this project was to speed the restoration of woody plants in marsh habitats. With the knowledge gained so far, we have more complete knowledge of the site characteristics necessary for successful woody plant establishment.

Because of the natural disasters, there is money left in the project. We would like to make closer observations of sites available for replanting and test some of our observations on prior vegetative cover, plant size, and soil amendments with further plantings in late 2006 and early 2007.

In conjunction with the Phase II project, Golden Meadow PMC has made over 1000 woody plants available for distribution by BTNEP. The plants, mostly live oak and red mulberry, were given to governmental and private groups to help ameliorate damage by the hurricanes. Additional plants are available for BTNEP distribution at their public expositions.

In the third quarter of FY 07 most of the remaining woody plants were distributed to worthy causes as determined by BTNEP. We have retained a number of Grand Isle provenance live oak, honey locust and tooth-ache tree for further plantings on marsh sites in the Bayou Lafourche drainage or as otherwise determined by BTNEP needs.

BARATARIA 6-12-07

Sample#	Row#	Species	Tree Diameter (mm)	Overall Height (cm)	Overall Spread	Frtn Vgpr	Disease	Rot	Notes
1	101	Gleditsia tricanthos	-	-	-	9			Added to Plot 4-8-04
2	102	Quercus virginiana							Added to Plot 4-8-04
3	103	Lantana camera	-	-	-	9			Added to Plot 4-8-04
4	104	Callicarpa americana	-	-	-	9			Added to Plot 4-8-04
5	105	Callicarpa americana	-	-	-	9			Added to Plot 4-8-04
6	106	Cornus drummondii	-	-	-	9			Added to Plot 4-8-04
7	107	Quercus virginiana							Added to Plot 4-8-04
8	108	Gleditsia tricanthos	-	-	-	9			Added to Plot 4-8-04
9	109	Zanthoxylum clava-herculis	-	-	-	9			Added to Plot 4-8-04
10	110	Quercus virginiana							Added to Plot 4-8-04
11	111	Cornus drummondii	-	-	-	9			Added to Plot 4-8-04
12	201	Zanthoxylum clava-herculis	-	-	-	9			Added to Plot 4-8-04
13	202	Lantana camera	-	-	-	9			Added to Plot 4-8-04
14	203	Cornus drummondii	-	-	-	9			Added to Plot 4-8-04
15	204	Parkinsonia aculeata	-	-	-	9			Replaced 4-8-04
16	205	Acacia farnesiana	-	-	-	9			
17	206	Morella cerifera	-	-	-	9			Replaced 3-19-04
18	207	Celtis laevigata	-	-	-	9			Replaced 3-19-04
19	208	Acacia farnesiana							
20	209	Parkinsonia aculeata	-	-	-	9			
21	210	Morella cerifera	-	-	-	9		hit by mower	Replaced 3-19-04
22	211	Celtis laevigata							
23	301	Callicarpa americana	-	-	-	9			Added to Plot 4-8-04
24	302	Zanthoxylum clava-herculis	-	-	-	9			Added to Plot 4-8-04
25	303	Quercus virginiana	-	-	-	9			Added to Plot 4-8-04
26	304	Celtis laevigata	-	-	-	9			Replaced 3-19-04
27	305	Acacia farnesiana							
28	306	Acacia farnesiana	-	-	-	9			
29	307	Parkinsonia aculeata	-	-	-	9			
30	308	Morella cerifera	-	-	-	9			Replaced 3-19-04
31	309	Acacia farnesiana							
32	310	Morella cerifera							Replaced 3-19-04
33	311	Celtis laevigata	-	-	-	9		missing	
34	401	Gleditsia tricanthos	-	-	-	9			Added to Plot 4-8-04
35	402	Cornus drummondii	-	-	-	9			Added to Plot 4-8-04
36	403	Gleditsia tricanthos							Added to Plot 4-8-04
37	404	Morus rubra	-			9			Replaced 3-19-04
38	405	Acacia farnesiana							
39	406	Diospyros virginiana	-	-	-	9			Replaced 3-19-04
40	407	Morus rubra	-	-	-	9			
41	408	Morus rubra	-	-	-	9			Replaced 4-8-04
42	409	Diospyros virginiana	-	-	-	9			
43	410	Morus rubra	-	-	-	9			Replaced 4-8-04
44	411	Diospyros virginiana	-	-	-	9			Replaced 3-19-04
45	501	Lantana camera	-	-	-	9			Added to Plot 4-8-04
46	502	Gleditsia tricanthos							Added to Plot 4-8-04
47	503	Zanthoxylum clava-herculis	-	-	-	9			Added to Plot 4-8-04
48	504	Parkinsonia aculeata							
49	505	Diospyros virginiana							
50	506	Morella cerifera							
51	507	Morella cerifera	-	-	-	9			Replaced 3-19-04
52	508	Celtis laevigata	-	-	-	9			
53	509	Diospyros virginiana	-	-	-	9			
54	510	Parkinsonia aculeata	-	-	-	9			
55	511	Morus rubra	-	-	-	9			
56	601	Zanthoxylum clava-herculis	-	-	-	9			Added to Plot 4-8-04
57	602	Quercus virginiana	-	-	-	9			Added to Plot 4-8-04
58	603	Cornus drummondii	-	-	-	9			Added to Plot 4-8-04
59	604	Morus rubra	-	-	-	9			
60	605	Celtis laevigata							
61	606	Morella cerifera	-	-	-	9			Replaced 3-19-04
62	607	Parkinsonia aculeata							
63	608	Lantana camera	-	-	-	9			
64	609	Callicarpa americana							Replaced 3-19-04
65	610	Callicarpa americana							Replaced 3-19-04
66	611	Lantana camera	-	-	-	9			Replaced 3-19-04

Fourchon 5-24-07

Sample#	Row#	Species	East Diameter (m)	Ceal Height (m)	Ceal Spread (m)	Flr Vgr	Decid	Flr	Notes
1	101	Zanthoxylum clava-herculis	-	-	-	9			
2	102	Acacia farnesiana	*	210	360	3			
3	103	Celtis laevigata	33.57	210	100	4			
4	104	Acacia farnesiana	*	220	300	3			
5	105	Acacia farnesiana	*	300	460	4			
6	106	Quercus virginiana	69.25	300	190	1			
7	107	Morus rubra	-	-	-	9			
8	108	Celtis laevigata	28.09	180	110	5			
9	109	Quercus virginiana	62.73	250	200	1			
10	110	Celtis laevigata	20.11	90	30	6			
11	111	Morus rubra	-	-	-	9			
12	112	Acacia farnesiana	*	270	350	5			
13	113	Acacia farnesiana	*	250	360	3			
14	114	Celtis laevigata	-	-	-	9			
15	115	Morus rubra	-	-	-	9			
16	116	Quercus virginiana	34.18	140	100	4			
17	117	Celtis laevigata	18.10	80	30	6			
18	118	Quercus virginiana	-	-	-	9			
19	119	Morella cerifera	-	-	-	9			
20	120	Morella cerifera	-	-	-	9			
21	121	Morella cerifera	-	-	-	9			
22	122	Morus rubra	-	-	-	9			
23	123	Acacia farnesiana	*	90	160	5			
24	124	Quercus virginiana	-	-	-	9			
25	125	Morus rubra	-	-	-	9			
26	126	Quercus virginiana	-	-	-	9			
27	127	Zanthoxylum clava-herculis	-	-	-	9			
28	201	Zanthoxylum clava-herculis	-	-	-	9			
29	202	Morella cerifera	*	130	250	4			
30	203	Morella cerifera	*	230	190	3			
31	204	Morella cerifera	*	170	130	5			
32	205	Acacia farnesiana	*	260	450	2			
33	206	Quercus virginiana	58.82	260	100	2			
34	207	Morella cerifera	*	230	180	3			
35	208	Quercus virginiana	34.16	200	190	2			
36	209	Morus rubra	-	-	-	9			
37	210	Acacia farnesiana	*	280	390	4			
38	211	Celtis laevigata	29.19	210	70	5			
39	212	Quercus virginiana	41.95	280	130	3			
40	213	Quercus virginiana	-	-	-	9			
41	214	Celtis laevigata	-	-	-	9			
42	215	Celtis laevigata	-	-	-	9			
43	216	Acacia farnesiana	*	330	470	2			
44	217	Morella cerifera	-	-	-	9			
45	218	Celtis laevigata	-	-	-	9			
46	219	Celtis laevigata	17.18	50	10	7			
47	220	Quercus virginiana	29.19	130	70	4			
48	221	Acacia farnesiana	*	360	500	5			
49	222	Morus rubra	-	-	-	9			
50	223	Celtis laevigata	27.40	170	50	4			
51	224	Celtis laevigata	-	-	-	9			
52	225	Acacia farnesiana	*	220	500	4			
53	226	Morus rubra	-	-	-	9			
54	227	Zanthoxylum clava-herculis	-	-	-	9			
55	301	Zanthoxylum clava-herculis	-	-	-	9			
56	302	Morus rubra	-	-	-	9			
57	303	Morus rubra	-	-	-	9			
58	304	Quercus virginiana	14.03	60	60	5			
59	305	Quercus virginiana	21.24	50	10	7			
60	306	Morella cerifera	-	-	-	9			
61	307	Morus rubra	-	-	-	9			
62	308	Celtis laevigata	19.38	110	50	5			
63	309	Morella cerifera	*	220	140	4			
64	310	Acacia farnesiana	*	270	430	4			
65	311	Quercus virginiana	-	-	-	9			
66	312	Morus rubra	15.72	100	60	5			
67	313	Morella cerifera	*	240	190	3			
68	314	Celtis laevigata	-	-	-	9			
69	315	Celtis laevigata	20.11	100	40	6			
70	316	Quercus virginiana	-	-	-	9			
71	317	Morella cerifera	*	150	180	5			
72	318	Morella cerifera	*	200	200	6			
73	319	Morus rubra	-	-	-	9			
74	320	Acacia farnesiana	*	300	430	4			
75	321	Morella cerifera	*	130	190	2			
76	322	Morella cerifera	*	220	200	3			
77	323	Morus rubra	-	-	-	9			
78	324	Acacia farnesiana	*	260	500	5			
79	325	Morus rubra	-	-	-	9			
80	326	Acacia farnesiana	*	210	500	5			
81	401	Parkinsonia aculeata	-	-	-	9			
82	402	Diospyros virginiana	15.77	90	40	2			
83	403	Callicarpa americana	-	-	-	9			
84	404	Lantana camera	-	-	-	9			
85	405	Gleditsia tricanthos	-	-	-	9			
86	406	Lantana camera	-	-	-	9			
87	407	Parkinsonia aculeata	22.92	120	70	3			
88	408	Diospyros virginiana	-	-	-	9			
89	409	Gleditsia tricanthos	10.10	60	40	5			
90	410	Callicarpa americana	-	-	-	9			
91	411	Parkinsonia aculeata	17.91	80	40	4			not dead
92	412	Diospyros virginiana	-	-	-	9			
93	413	Lantana camera	-	-	-	9			
94	414	Gleditsia tricanthos	18.01	80	60	4			
95	415	Diospyros virginiana	-	-	-	9			
96	416	Parkinsonia aculeata	18.78	70	30	5			
97	417	Lantana camera	-	-	-	9			
98	418	Callicarpa americana	-	-	-	9			
99	419	Gleditsia tricanthos	-	-	-	9			
100	420	Lantana camera	-	-	-	9			
101	421	Diospyros virginiana	-	-	-	9			
102	422	Callicarpa americana	-	-	-	9			
103	423	Gleditsia tricanthos	-	-	-	9			
104	424	Callicarpa americana	-	-	-	9			
105	425	Parkinsonia aculeata	-	-	-	9			



Sample#	Row#	Species	Base Diameter (cm)	Crown Height (cm)	Crown Spread (cm)	Fltr Vgr	Disease	Fest	Notes
1	101	Zanthoxylum clava-herculis	-	-	-	9			
2	102	Acacia farnesiana	*	210	360	3			
3	103	Celtis laevigata	33.57	210	100	4			
4	104	Acacia farnesiana	*	220	300	3			
5	105	Acacia farnesiana	*	300	460	4			
6	106	Quercus virginiana	69.25	300	190	1			
7	107	Morus rubra	-	-	-	9			
8	108	Celtis laevigata	28.09	180	110	5			
9	109	Quercus virginiana	62.73	250	200	1			
10	110	Celtis laevigata	20.11	90	30	6			
11	111	Morus rubra	-	-	-	9			
12	112	Acacia farnesiana	*	270	350	5			
13	113	Acacia farnesiana	*	250	360	3			
14	114	Celtis laevigata	-	-	-	9			
15	115	Morus rubra	-	-	-	9			
16	116	Quercus virginiana	34.18	140	100	4			
17	117	Celtis laevigata	18.10	80	30	6			
18	118	Quercus virginiana	-	-	-	9			
19	119	Morella cerifera	-	-	-	9			
20	120	Morella cerifera	-	-	-	9			
21	121	Morella cerifera	-	-	-	9			
22	122	Morus rubra	-	-	-	9			
23	123	Acacia farnesiana	*	90	160	5			
24	124	Quercus virginiana	-	-	-	9			
25	125	Morus rubra	-	-	-	9			
26	126	Quercus virginiana	-	-	-	9			
27	127	Zanthoxylum clava-herculis	-	-	-	9			
28	201	Zanthoxylum clava-herculis	-	-	-	9			
29	202	Morella cerifera	*	130	250	4			
30	203	Morella cerifera	*	230	190	3			
31	204	Morella cerifera	*	170	130	5			
32	205	Acacia farnesiana	*	260	450	2			
33	206	Quercus virginiana	58.82	260	100	2			
34	207	Morella cerifera	*	230	180	3			
35	208	Quercus virginiana	34.16	200	190	2			
36	209	Morus rubra	-	-	-	9			
37	210	Acacia farnesiana	*	280	390	4			
38	211	Celtis laevigata	29.19	210	70	5			
39	212	Quercus virginiana	41.95	280	130	3			
40	213	Quercus virginiana	-	-	-	9			
41	214	Celtis laevigata	-	-	-	9			
42	215	Celtis laevigata	-	-	-	9			
43	216	Acacia farnesiana	*	330	470	2			
44	217	Morella cerifera	-	-	-	9			
45	218	Celtis laevigata	-	-	-	9			
46	219	Celtis laevigata	17.18	50	10	7			
47	220	Quercus virginiana	29.19	130	70	4			
48	221	Acacia farnesiana	*	360	500	5			
49	222	Morus rubra	-	-	-	9			
50	223	Celtis laevigata	27.40	170	50	4			
51	224	Celtis laevigata	-	-	-	9			
52	225	Acacia farnesiana	*	220	500	4			
53	226	Morus rubra	-	-	-	9			
54	227	Zanthoxylum clava-herculis	-	-	-	9			
55	301	Zanthoxylum clava-herculis	-	-	-	9			
56	302	Morus rubra	-	-	-	9			
57	303	Morus rubra	-	-	-	9			
58	304	Quercus virginiana	14.03	60	60	5			
59	305	Quercus virginiana	21.24	50	10	7			
60	306	Morella cerifera	-	-	-	9			
61	307	Morus rubra	-	-	-	9			
62	308	Celtis laevigata	19.38	110	50	5			
63	309	Morella cerifera	*	220	140	4			
64	310	Acacia farnesiana	*	270	430	4			
65	311	Quercus virginiana	-	-	-	9			
66	312	Morus rubra	15.72	100	60	5			
67	313	Morella cerifera	*	240	190	3			
68	314	Celtis laevigata	-	-	-	9			
69	315	Celtis laevigata	20.11	100	40	6			
70	316	Quercus virginiana	-	-	-	9			
71	317	Morella cerifera	*	150	180	5			
72	318	Morella cerifera	*	200	200	6			
73	319	Morus rubra	-	-	-	9			
74	320	Acacia farnesiana	*	300	430	4			
75	321	Morella cerifera	*	130	190	2			
76	322	Morella cerifera	*	220	200	3			
77	323	Morus rubra	-	-	-	9			
78	324	Acacia farnesiana	*	260	500	5			
79	325	Morus rubra	-	-	-	9			
80	326	Acacia farnesiana	*	210	500	5			
81	401	Parkinsonia aculeata	-	-	-	9			
82	402	Diospyros virginiana	15.77	90	40	2			
83	403	Callicarpa americana	-	-	-	9			
84	404	Lantana camera	-	-	-	9			
85	405	Gleditsia tricanthos	-	-	-	9			
86	406	Lantana camera	-	-	-	9			
87	407	Parkinsonia aculeata	22.92	120	70	3			
88	408	Diospyros virginiana	-	-	-	9			
89	409	Gleditsia tricanthos	10.10	60	40	5			
90	410	Callicarpa americana	-	-	-	9			
91	411	Parkinsonia aculeata	17.91	80	40	4			not dead
92	412	Diospyros virginiana	-	-	-	9			
93	413	Lantana camera	-	-	-	9			
94	414	Gleditsia tricanthos	18.01	80	60	4			
95	415	Diospyros virginiana	-	-	-	9			
96	416	Parkinsonia aculeata	18.78	70	30	5			
97	417	Lantana camera	-	-	-	9			
98	418	Callicarpa americana	-	-	-	9			
99	419	Gleditsia tricanthos	-	-	-	9			
100	420	Lantana camera	-	-	-	9			
101	421	Diospyros virginiana	-	-	-	9			
102	422	Callicarpa americana	-	-	-	9			
103	423	Gleditsia tricanthos	-	-	-	9			
104	424	Callicarpa americana	-	-	-	9			
105	425	Parkinsonia aculeata	-	-	-	9			

