

# Marion 1: Restoration of the Natural Landscape

by Ben Mercadante and Peter NeSmith

all photos by the authors



Above: Ben Mercadante, author and co-owner, Hickory Hill Native Nursery, begins the day by unloading plants from the back of the truck.

Below: Ben and Simon Cordery. Note Simon's augering tool, used to dig holes (and save labor!).

The dirt road leads south onto the property, down toward the river. An early morning mist hangs over the marshy depressions and some wading birds stir and fly up into a large dead snag, squawking disapproval at the invasion of their serenity. I slowly cruise by with a truckload of native plants being used for part of the plant enhancement segment of the restoration project. Being a part of this project gives me a great sense of satisfaction and a feeling of accomplishment that one is fortunate to experience in the workplace.

Marion 1 is the temporary name for a site acquired by the Southwest Florida Water Management District (SWFWMD) in 1995, using both P2000 and Save Our Rivers funds. The primary water resource values for which it was acquired are aquifer recharge and flood control. Legislative and District policy require that the site be managed to maintain and restore its natural val-

ues. Marion 1 is located in Marion county, immediately north of the Withlacoochee River, west of State Road 200 and south of County Road 484. The name Marion 1 will be changed as part of the land use planning process.

Marion 1 consists of approximately 8000 acres, including large expanses of pasture, pine plantation, recovering sandhill and about three miles of river floodplain. This is a large and complex site with many detailed issues and agendas. Perhaps the best overall description of the project is the District's mission statement for the property, which gives us insight to District philosophy concerning lands such as Marion 1:

*"It is the District's restoration mission to, when practicable and warranted, replace those unnatural elements and processes that have been added. This mission holds true for the Marion 1 restoration project. Further, it is a major principle when planning and designing restoration techniques for the site, to focus on re-establishing those elements that will have the greatest effect in "jump starting" the natu-*





“Here’s to what natural wonders one may observe in the future within the boundaries of this land acquisition and restoration success: Marion 1, a jewel on the banks of the Withlacoochee River” – P. NeSmith

ral recovery of the target community. For example, restoring the historic hydrological regime to a severely drained site will facilitate the recruitment or expansion of the desired assemblage of plant species; reintroducing herbaceous plants that serve as fire fuels will facilitate the reintroduction of the essential process of fire; and the reintroduction of vegetational structure that is useful for wildlife will enhance the dispersal of wildlife-borne propagules from the adjacent communities. It is very seldom necessary, not to mention practical or possible, to try to recreate an entire complex community in one fell swoop. This was the rationale used in the design of the Marion 1 site.”

When SWFWMD obtained the Marion 1 property, they had to assess the impacts and condition of the land before any detailed management plan could be implemented. The main impacts that occurred were logging, cattle ranching, and conversion to planted pine. There are approximately 2293 acres of fully improved pasture typically in bahia, an exotic grass not favorable to growing season burns. Also, ditching was implemented to drain several of the wetland systems that were interspersed in the pasture areas.

As one might guess, the result of these impacts on the ecology has not been favorable. According to Kevin Love, Land Manager with the SWFWMD Land Resources Department, a loss of almost 50% of native vegetation had occurred on the site, with the complete removal of the natural forest canopy and structure. The wiregrass community had been all but replaced by the exotic bahia grass, and where the native herbaceous systems were intact in and around the isolated wetlands, the composition of the vegetation had changed due to grazing and other mechanical disturbances.

A good part of a land management plan



Peter Nesmith, author and project manager, Water and Air Research, planting with Simon Cordery (holding auger).

goes into defining the original habitat that existed before impacts have occurred. After some determinations had been made, Kevin described the tract as follows: “On the far east side of the property, long leaf pine and turkey oak sandhill was the historic vegetation cover. The western portion of the tract, including the restoration sites and the majority of the pine plantations were in low pine flatwoods. Numerous cypress ponds and sloughs are still present, interspersed in the plantations, while herbaceous marshes and sloughs occur within the restoration sites. Oak hammocks and oak scrub were also present in the landscape, although it is suspected that these habitat types were quite limited.”

Two locations on the tract were chosen as the initial restoration sites and identified simply as Area 1 and Area 2. To comply with

wetland impacts that had occurred on other sites within the Withlacoochee river basin due to roadway work, the Florida Department of Transportation (DOT) funded the projects and worked with the design and installation along with SWFWMD, Environmental Management Systems Inc., and Water and Air Research. DOT will participate and implement land management practices, such as controlled burns, and also maintain quarterly monitoring for up to five years. These efforts will be achieved while working with District staff and outside environmental consultants and contractors. The basic design plan for the restoration of Area

2 calls for the enhancement of 90 acres of herbaceous wetlands through the filling of ditches. These marshes will stabilize and grow as their natural hydrology returns. Mary Barnwell, Land Management Specialist with the SWFWMD Land Resources Department, has noticed an increase in large wading birds frequenting the site recently – this may be a sign of recovery in process. Additional restoration tasks will include 8.6 acres of oak hammock, 2.7 acres of mesic hammock, 37 acres of xeric pine flat woods, 80 acres of low pine flatwoods, and 31 acres of wetland enhancement through the planting of the upland habitats in Area 1 [author Peter NeSmith describes this task in detail on page 10 –Ed.]. Also, an additional 6.2 acres of herbaceous wetlands was created in order to obtain fill for the ditches of Area 2.

The commitment for Marion 1 will con-



continue on and evolve into the future, funds permitting. A large area of improved pasture has been slotted for restoration, and is in the pre-design stages, to be started in the next two years. There is also a long term interest in the history and current trends of targeted fauna such as gopher tortoises, gopher frogs, redheaded woodpeckers, scrub jays, wading birds, and sandhill cranes. A log of annual surveys will be conducted to determine the trends and impacts of coyote and feral hog populations on the site. Feral hog trapping will be performed to alleviate the destruction and stress of the mesic and wetland habitats.

As mentioned earlier, this site has a diverse agenda. Two groups, the Seminole Wars Foundation and the Gulf Archeology Research Institute, through a license agreement with SWFWMD, are excavating an historical battle site, Camp Izard, within the Marion 1 tract. The Seminole Wars Foundation hopes to develop an interpretive trail where groups will be escorted through the historic site. Camp Izard was the site of a siege in 1836 between the Seminoles and the U.S. Army during the Second Seminole Wars period.

Another example of the property being involved with other groups and agencies is where the Marion site intersects another public land. The northern portion of the property lies within the Cross Florida Greenway (CFG), SWFWMD agreed to provide an easement to the Florida Department of Environmental Protection Office of Greenways and Trails (OGT) to allow recreational access along a formerly disjunct section of the Greenway. This corridor will be designated as a multiple-use recreation facility. A trailhead with restrooms will be located on the District's property to accommodate recreational users.

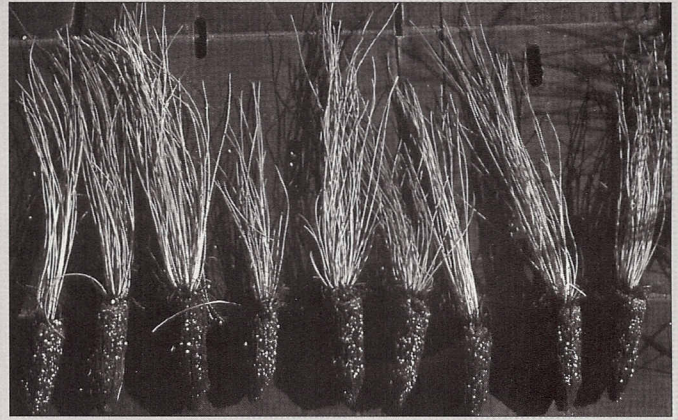
We hope we've stirred your interest about the Marion 1 site. Projects like this deserve all the attention they can get, as they are an important investment for the future.

[Be sure to read through page 12 for information about the authors and their work teams, as well as how to visit the Marion 1 site. -Ed.]

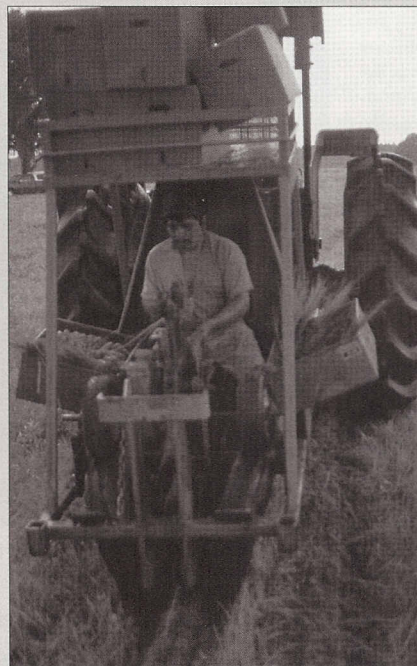
## Details of Plant Restoration and Enhancement in Area 1

As the Project Manager for Water and Air's restoration efforts for the Florida Department of Transportation's mitigation at Marion 1, I was excited about starting the large and ecologically challenging project. However, when we finished unloading the first Florida Division of Forestry truck, the realization of what a huge task we had taken on finally hit me. Under an impressive, gracefully spreading 150 year-old live oak, the stack of boxes lay seven feet high, ten feet wide, and nearly twenty feet long — a daunting site, more than 50,000 wiregrass (*Aristida beyrichiana*) plugs awaited

planting, and that wasn't even half the number we were required to plant. But with the aid of a mechanical tree planting tractor and an experienced team, we accomplished the entire wiregrass installation task (117,000+ wiregrass plugs) in about nine days. The physical and logistical tasks associated with the wiregrass restoration were challenging, to say the least. But even more exhausting was the anxiety caused by unpredictable, late summer thunderstorms (or more specifically, the lack thereof). Fortunately, the rains came and went and came again, the wiregrass responded positively, and the installation was a success.



Above: Longleaf pine seedlings in plug form, ready for planting.

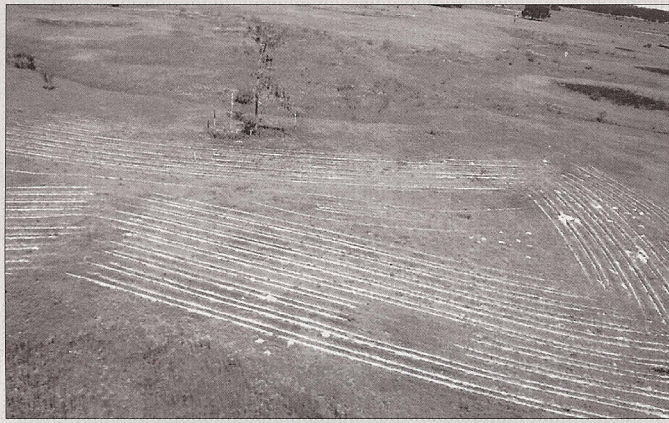


Left: A custom plug-planting system was used to install the tens of thousands of longleaf and wiregrass plugs.

Two years later, with survival rates in the neighborhood of 90-95%, the planted areas are thick with healthy wiregrass clumps and well on their way to re-establishing the historical fire regime and habitat that ex-

isted prior to logging and cattle grazing disturbances. Wiregrass was installed at the site's higher elevations (about eight feet above the freshwater marsh elevations) in conjunction with 40,000 muhlygrass (*Muhlenbergia capillaris*) plugs at slightly lower elevations to increase the native grasses that produce fine fuels, a critical component required to re-establish a natural fire regime. Fine fuels like wiregrass and muhlygrass leaf-blades (as opposed to larger fuels such as woody twigs and branches) are very important in carrying fire across the landscape and are instrumental in the site's restoration plan. Other native grasses installed to increase plant di-





Aerial view of Area 1 shows the planted rows of wiregrass plugs. Using a tractor was not only a timesaver, but the furrowing dislodged the surrounding vegetation, allowing the wiregrass and longleaf seedlings time to get established.

iversity and wildlife habitat include eastern gamagrass (*Tripsachum dactyloides*), a food source for dove and quail, and the gracefully arching lopsided Indiangrass (*Sorghastrum secundum*).

With the successful installation of the grasses, restoration efforts continued with the installation of various other floral components of a healthy and vital longleaf pine flatwoods. Interspersed randomly within the wiregrass and in open areas surrounded by wiregrass, approximately 5000 longleaf pine (*Pinus palustris*) were installed. Longleaf pine, an important and once dominant component of the Southeastern United States' wiregrass ecosystems, was the first of many non-grass, fire-dependent species to be installed. Other species incorporated in the restoration effort include saw palmetto (*Serenoa repens*), tough buckthorn (*Bumelia tenax*), various blueberries at different topological gradients (*Vaccinium arboreum*, *V. darrowii*, *V. myrsinites* and *V. corymbosum*), rusty lyonia (*Lyonia ferruginea*), gopher apple (*Licania michauxii*) concentrated in the vicinity of active gopher tortoise burrows, and various mast [acorn] producing oaks (*Quercus myrtifolia*, *Q. pumila* and *Q. virginiana*). Other important species incorporated into the restoration effort include Florida pennyroyal (*Piloblephis rigida*), blazing stars (*Liatrix* spp.), Cherokee bean (*Erythrina herbacea*

and dotted horsemint (*Monarda punctata*). These species were interspersed within gaps in the wiregrass plantings and grouped to simulate natural occurrences and associations.

In addition to restoration of communities requiring frequent fire, several other communities that are less fire tolerant are being revegetated. Oak hammock species are being planted around several of the existing large old live oaks. Species to be included in these areas include laurel oak (*Quercus hemisphaerica*), pignut hickory (*Carya glabra*), beautyberry (*Callicarpa americana*), coontie (*Zamia pumila*), wild petunia (*Ruellia carolinensis*) and yaupon holly (*Ilex vomitoria*). Fire shadows appear to have been a natural occurrence in areas where the prevailing summer winds, in association with wetlands, created a mosaic of unburned areas. To re-create the fire shadow effect, restorationists had to assess the surrounding landscape for smoke sensitive areas, and then site fire shadows based on acceptable winds for prescribed fire. These areas have been planted with sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), Walters viburnum (*Viburnum obovatum*), and sabal palms (*Sabal palmetto*).

Over half of the restoration site consists of freshwater wetlands with a well-represented diversity of naturally occurring native plants. Several of the wetlands have been augmented with species that have been found to occur in surrounding off-site wetlands such as pond cypress (*Taxodium ascendens*), swamp blackgum (*Nyssa sylvatica* var. *biflora*), swamp dogwood (*Cornus foemina*), fetter bush (*Lyonia lucida*), Virginia willow (*Itea virginica*), soft rush (*Juncus*

*effusus*) and pop ash (*Fraxinus caroliniana*). Wetlands on-site that are not planted with native hardwoods and cypress were sparsely planted with pond pine (*Pinus serotina*). Small, naturally occurring depressions were planted with sand cordgrass (*Spartina bakeri*), climbing aster (*Aster carolinianus*), Elliot's aster (*A. elliotii*), and string lily (*Crinum americanum*).

Despite difficult and unpredictable weather conditions experienced throughout the installation effort, the project has progressed with some pronounced success. There was some mortality due to drought in 1998, but it appears to be limited in extent. To date, approximately 170,000 native plants have been installed, comprising more than 35 species and four distinct habitat types. Ecological monitoring began in October 1998, feral pig trapping will commence as soon as possible, and the first of many summer burns will begin in May or June of 1999.

It appears, based on observations made during the past several years and many long days on-site, that faunal diversity has increased. This may be associated with the ever-increasing plant diversity and the elimination of the destructive cattle grazing; however, it is a mere pittance compared to what is expected many years from now, after maturation of the site's flora in combination with a natural fire regime. To many, this restoration project may seem like too much work and expense for just one site; however, the benefits are vast. This tract, which has been ecologically damaged by many decades of consumptive use by the cattle and logging industry and has experienced a great loss of plant and animal diversity, now has an additional seed source for many of the native species that once inhabited its various ecological niches. Entire regions of flora and fauna will benefit from the ecologically sound manner in which this project has progressed over the past three years. ☀



## CALENDAR OF EVENTS

FEBRUARY 6, 1999

### FNPS State Board of Directors

Environmental Learning Center, Wabasso (Indian River County). Contact your Chapter Director or Candy Weller, FNPS President, for more info.

MARCH - MAY 1999

### Focus on Spring Wildflowers

The Magnolia Chapter FNPS is coordinating a series of educational programs and field trips throughout the months of March, April, and May. Community presentation on Apalachicola National Forest on March 2nd, with field trip to see wildflowers and endangered species at Three Rivers State Park on March 6. For more information, contact Gil Nelson at 850-893-5152 or 72700.3601@compuserve.com.

MARCH 31-April 2

### Spring Conference of the Florida Chapter of the Wildlife Society

"Managing for Biodiversity," a conference held in conjunction with the Natural Areas Association, Orlando Renaissance Hotel. For more information, contact Pete David, Program Chair, at pete.david@sfwmd.gov or via mail: Dupuis Management Area, 23500 SW Kanner Hwy, Canal Point, FL 33438. Also visit website at <http://www.nettally.com/fltws>.

APRIL 8-13, 1999

### North American Native Orchid Alliance Conference

at University of South Florida, Tampa. Speakers include John Beckner, Roger Hammer, Paul Martin Brown, and Chuck McCartney. Space is limited and there may be no on-site registration. Write North American Native Orchid Alliance, PO Box 772121, Ocala FL 34477-2121. Also, visit website at: <http://www.naorchid.com>.

MAY 6-9, 1999

### FNPS 19th Annual Conference

Palm Coast Resort, Flagler County. Full program to be published in the Spring 1999 issue of *The Palmetto*.

MAY 13-14, 1999

### Twenty-Sixth Annual Ecosystems Restoration and Creation, Conference

Sponsored by Hillsborough Community College Environmental Studies Center, Tampa, Florida.

May 24-27, 1999

### Florida Exotic Pest Plant Council Annual Conference

Holiday Inn University Center, Gainesville. Abstract deadline is February 26, 1999. Contact Mike Bodle for more information at 800-432-2045 ext. 6132, FAX: 561-681-6232, or [mbodle@sfwmd.gov](mailto:mbodle@sfwmd.gov).

For deadlines and to have your events listed, please contact the editor at (407) 951-2210 or send electronic mail to: [mondcmd@aol.com](mailto:mondcmd@aol.com).

## Fire Facts

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equipment to enter. In such cases, the management strategy employed by fire supervisors is to protect the fighters and equipment by evacuating the neighborhood and defending the perimeters. This becomes a triage management situation. Under triage conditions, limited rescue resources are directed toward the houses that have the greatest potential for survival. Homes that do not have good access have low potential for survival.

**Question: Does the draining and destruction of wetlands have anything to do with these fires?**

**Christman:** Draw-down of wetlands for well-field use, and alteration of hydrologic flow have for the past 30 or so years altered the hydrology and nutrient cycling of many Florida wetlands. The reduction in available water and/or water storage capacity in wetlands has resulted in the drying of heavy organic material known as *muck*, which will burn in drought conditions. A visible result of these (and other) impacts has been the apparent increase in the number of muck fires occurring in these wetlands during dry periods. Muck fires are extremely difficult to contain, or extinguish, and produce extensive amounts of acrid black smoke.

**Miller:** Yes, undoubtedly the draining that has been completed over the past hundred years contributes to fire hazard. This contribution is probably too complex to quantify. In the case of the 1998 fires, drought (more than nine weeks without rain) was significant enough that fires were going to be a problem with or without increased drainage.

**Minno:** Yes. Canals and ditches in wetlands as well as upland communities lower the water tables and make areas more susceptible to fire. Palm Coast in Flagler County is a good example. This development has been hit by two large-scale fires in the last twenty years. The development was made possible because of the extensive system of canals that drains half of Flagler County. ☀

Look for Part II of Facts about Fire in the Native Landscape in our Spring 1999 issue of *The Palmetto*.

## Marion 1: Restoration of the Natural Landscape

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**If You Want to Visit:** The Marion 1 site is open to the public for certain recreational uses. Details and regulations are available through information lines at SWFWMD. Some of the uses mentioned for the Marion 1 Site are hiking, birding, fishing, and canoeing. As the management plan is completed, other opportunities may arise, such as the development of equestrian trails and the integration of hiking trails into the current trail systems within this region. There is also the possibility of low-impact primitive camping sites as a joint effort with Marion County. Low-intensity hunting may also be considered on-site with the cooperation of the Florida Game and Fresh Water Fish Commission. It is the responsibility of visitors to abide by regulations and assume the responsibilities expected of users sharing public land. Basic rules include staying on designated roads and trails, obeying all signs, and not collecting any plant or animal species. For further information, please contact The District Land Resources Department at 352-796-7211, ext. 4470.

**AUTHORS' NOTES:** The more we worked on the project, the more we were impressed by the commitment and loyalty of all the team members, factors which directly contributed to the success of the project. Team members include Kevin Love, District Land Manager, and Mary Barnwell, Land Manager Specialist, both with the Southwest Florida Water Management District Department of Land Resources, 2379 Broad St, Brooksville FL 34609-6899; Florida DOT Project Manager, Steve Tonges; Environmental Management Systems Inc. Design Consultant, Stuart Bradow; Water and Air Research Inc. Restoration Management and Installation Manager, Peter NeSmith; Urban Forestry Services Suppliers Mike and Sandy Campbell; Possum Hollow Orchards and Nursery Supplier, Joe Durando; and Hickory Hill Native Nursery Suppliers, Ben Mercadante and Rick McDonnell.

**ABOUT THE AUTHORS:** Ben Mercadante is co-owner of Hickory Hill Native Nursery in Brooksville and is the Vice President of the Association of Florida Native Nurseries. Ben's early interest in native plants was nurtured by his mother, Mary Mercadante, a member of the Florida Native Plant Society when our organization was in its formative stages. Peter NeSmith is a field biologist and project manager for Water and Air Research, an environmental engineering firm located in Gainesville.