

10 Little Pine Island Marks Years of Wetland Restoration

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A major milestone in exotic removal, the 10th anniversary marking the restoration of Little Pine Island, occurred on March 24, 2007. Residents of Pine Island and other communities within greater southwest Florida joined in the open house celebration hosted by Mariner Properties Development. Activities included a wildlife photography workshop, guided hikes, kayak raffle, and a barbecue lunch. High spirits and good humor abounded at a ceremony in which the last remaining melaleuca tree, which had been spray-painted gold, was felled with a golden ax! Why all the hoopla? This restoration is a tale worth telling.

Little Pine Island (LPI) is an extensive coastal wetland sandwiched between Pine Island and Matlacha Pass Aquatic Preserve in the greater Ft. Myers area of the Florida Gulf Coast. Landward from the island's fringing mangrove forest, the interior is transformed into an array of salt and freshwater marshes, salt flats, maritime meadows, buttonwood hammock, and stands of slash pine. A cross section resembles an inverted shallow bowl with the highest areas of elevation towards the center where Pine Island Road (State Road 78) bisects the 4,700-acre island. This site, a part of Charlotte Harbor Preserve State Park and a listed stop on the Great Florida Birding Trail, also functions as a mitigation bank through a partnership between the Florida Department of Environmental Protection (DEP) and Mariner Properties Development (MPD).

Currently, public access is temporarily closed due to heavy equipment operations. A limited number of guided field trips are offered annually during the fall, winter, and



Golden ax in hand, the Mariner team, DEP and KLECE ecologists gear up to take down the last melaleuca tree.

spring through the state park field office. Upon completion of the restoration, a series of trails will be created throughout the island for the benefit and enjoyment of the public. LPI is predominantly high marsh consisting of broad expanses of grasses (*Distichlis*, *Paspalum*, and *Spartina* spp.) sedges (*Eleocharis* and *Fimbristylis* spp.), and black needlerush (*Juncus roemerianus*). This invaluable habitat exports tons of organic biomass to the estuary annually, supports a diversity of wildlife, serves as a nursery for juvenile fish, and provides critical rest stops and breeding areas for migratory birds.

Salt marsh habitat is one of the most impacted ecosystems in the greater Charlotte Harbor estuary. Over 60 percent of the original marshes surrounding the harbor were lost to development or habitat changes caused by hydrological alteration. Mosquito control ditching and draining operations were conducted on LPI in the

late 1950s and 1960s, while the island was privately owned. The hydrologic regime was changed, facilitating the spread of melaleuca (*Melaleuca quinquenervia*), Brazilian pepper (*Schinus terebinthifolius*), and Australian pine (*Casuarina* spp.). The loss of natural sheet flow and tidal action, together with the infestation of melaleuca, was destroying the marsh and its capacity to support wildlife. Had it not been for the fortuitous attendance of a local entrepreneur at a Washington, DC conference in 1993, this rare gem of an island might have been lost forever.

Raymond Pavelka, MPD President had experienced uncertainties and liabilities associated with traditional on-site/off-site mitigation in his 21 years with Mariner Properties, Inc. At the Urban Land Institute Conference, he listened to a DEP presentation showing that 74 percent of project mitigation during the past 10 years had failed. The concept of mitigation

banking was introduced and Ray took up Thomas Edison's challenge "There's a better way – Find it!" Mindful of the potential, he began to explore the feasibility of establishing a mitigation bank in coastal southwest Florida and sought out a scientist known for wetland restoration experience: Kevin Erwin, Principal Ecologist of Kevin L. Erwin Consulting Ecologist Inc. (KLECE). Erwin, a member of Governor Lawton Chiles' Wetland Mitigation Banking Task Force, had just published a comprehensive study, "Wetland Mitigation in the South Florida Water Management District (SFWMD)." He confirmed that mitigation banking was one of the more desirable solutions to offset wetland impacts and a list of potential bank sites was prepared.

Erwin had worked on LPI previously, aiding its transfer from private to public ownership, and suggested LPI as an ideal site, one meriting a high standard of restoration due to the rapidly expanding impacts resulting from drainage and exotic plant infestations. Meetings were held with Tallahassee officials to discuss the possibility of a public/private partnership. With the strong support of key DEP personnel, Mariner Properties Development secured unanimous approval by the Governor and Cabinet, completing rigorous state and federal permitting processes within 2.5 years. As Little Pine Island Mitigation Bank (LPIMB) was one of the first banks to be approved, agency regulators and MPD were actually defining the process as they went through it.

Wetland mitigation is the replacement of wetland functions which are lost from private development or public projects. Kevin conducted the research and developed the state's first wetland functional assessment methodology for evaluating potential impact sites that would use LPIMB as the required form of wetland mitigation. Between 1993 and early 1997, baseline studies were completed to determine the historical ecology, existing wetland functional capacity, methods of restoration, and criteria for success. His 1996 landmark report, "A Functional Assessment Procedure For Wetland Impact Sites," provides the criteria and formulas for determining Wetland Functional Capacity Scores for nine critical functions including 1) habitat

for wetland dependent species, 2) support of food chains, 3) support of native plant populations, 4) maintenance of biological integrity, 5) provision of landscape heterogeneity, 6) access to aquatic refugia, 7) maintenance of natural hydrologic regimes, 8) maintenance of water quality, and 9) support of soil processes. Calculations to determine the number of required bank credits were also derived. Credits, the equity in the bank, are created as a direct result of increased functional capacity resulting from restoration, and may be sold or transferred to a private entity or public agency in need of compensation for wetland impacts. One wetland mitigation credit is equivalent to the ecological value of one acre of healthy, properly functioning restored wetland. The LPI mitigation service area includes portions of Charlotte, Lee, Sarasota, and Collier Counties from the coast inland to the 100-year floodplain line.

After the agency permits were secured and the baseline ecological research had been conducted, Richard Anderson, MPD's Director of Sales and Customer Service, began to address the public and meet with community groups. Misconceptions had arisen such as the intent to build a subdivision or a gated community. In April 1997, LPI began undergoing the initial phases of exotic plant removal. Melaleuca was hand-cut with chainsaws and the stumps treated with herbicide. KLECE had investigated herbicide application rates and determined that a 20 percent concentration of Garlon would kill the exotics without harming the native seed bank. Bob Offi, MPD's Onsite Project Manager, who had encountered numerous snags (both literally and figuratively) during the past ten years, reflected on the sheer magnitude of cutting, treating, and removing an exotic forest in keeping with special permit requirements. Temporary roads had to be constructed to accommodate the removal of an average

of 30 tons of exotic biomass per acre. Tire mats better suited to the conditions and the movement of track hoes carrying trees to chippers were brought in to replace rigid steel mats. Chipped material was disposed of offsite at power plants for use as bio-fuel or a local composting facility for use as mulch.

Initially the barren appearance of clear-cut areas alarmed those accustomed to driving through the corridor of exotic forest on Pine Island Road. However, seed bank recovery was so phenomenal that the nursery Bob had set up to provide supplemental planting was eventually phased out. Wagon ride tours of the site were scheduled for area residents, agency personnel, and environmental groups. Functional Assessment of Wetlands Workshops were offered several times a year to train environmental specialists. Offi is in constant communication with the removal and maintenance crews. Consolidated Resource Recovery foreman David Pahuta is seeing the restoration through to the end, and foreman Rainey Adams of Caretaker Management ensures thorough follow-up maintenance. The upshot—seven miles of ditches have been filled and more than 5 million melaleucas and 100 million pounds

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The removal of temporary roads constructed from tire mats is the last remaining heavy equipment operation.

of exotic vegetation have been removed! Moreover, 106 bird species (including 51 wetland-dependent species), 11 mammal species, 17 reptile species, 7 amphibian species, 13 fish species, and 95 aquatic macro-invertebrate species have been counted by KLECE ecologists engaged in site monitoring.

LPI is a large-scale, regionally significant wetland restoration that initially called for the removal of 1600 acres of invasive vegetation and the hydrological restoration of 3300 acres. Weather, longer hydroperiods, melaleuca encroachment

on to another 200 acres, and working around nesting bald eagles that now return annually to a restored area resulted in extending the operations and increasing the number of years and investment costs originally estimated for completion. However, this restoration, now in its final phase, is equivalent to the replacement of nearly 500 separate wetland mitigation projects—their permitting, construction, and monitoring—and is far more successful than traditional “postage stamp” mitigation projects which are generally far more costly to manage. Private developers

and public agencies such as SFWMD, the Department of Transportation, and Lee County government have benefited from LPI's cost effective credits and ecologically sound restoration.

Although the cost to restore LPI will total nearly \$12 million, no public funding or taxpayer dollars have been involved. All restoration, maintenance, and monitoring costs are paid for by MPD. Of the total revenue generated from mitigation credit sales, 7 percent of which constitutes about \$2 million, is designated as a “State Use Fee” and is returned to Charlotte Harbor Preserve State Park. Further, an additional 5 percent of the total revenue from credits sales, in excess of \$1.5 million, was set aside when the LPI Preservation Trust Fund was created to fund the perpetual maintenance and long-term monitoring of the island. Preserve staff and others will have the opportunity to provide resource input to the Management Trustees. DEP and MPD have created a model public/private partnership that incorporates open-mindedness to problem-solving and applies new techniques creatively.

Had Ray Pavelka not assumed the risk or engaged such an effective team, Little Pine Island would have been entombed in melaleuca. Although Mariner Properties Development has yet to recoup the investment, the ecological profit—a recovered, thriving wetland—is tremendous. And walking through a sea of softly waving native grasses as the afternoon shadows lengthen with the setting sun—*priceless!*

Contact Richard Anderson, Mariner Properties Development, Inc., richard.anderson@marinerproperties.com or Kevin Erwin, Kevin L. Erwin Consulting Ecologist, Inc., klerwin@environment.com and visit the following websites: www.littlepineisland.com www.floridastateparks.org/CharlotteHarbor www.GreatFloridaBirdingTrail.com

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Reference

Kevin L. Erwin Consulting Ecologist, Inc. May 2006. Little Pine Island Mitigation Bank Eighth Annual Monitoring Report: Phases I, II, VA; Seventh Annual Monitoring Report: VB, VC, and VIIA; Second Annual Monitoring Report: VI and VIIB.

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