

Wetlands

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Michigan law requires every wetland area that is filled to be replaced elsewhere on at least a one-to-one basis.

At Ford TPC, six wetland areas were left untouched and just three filled and replaced.

"The builder was real happy with the results and we were able to preserve an ecosystem by building it into the course," said Noon.

The situation is even more dramatic in Florida where wetlands aren't just being preserved, they're being created, according to Steve Beeman. The former state environmental department biologist is the owner of Ecoshores, Inc., which designs and constructs vegetated shorelines in coastal wetlands, dunes and fresh-water ecosystems.

His company has grown from a two-man operation in 1978 to a 40-person firm that does \$1.5 million in business annually.

"For years, wetlands were simply lost to development," said Beeman, who estimated that 60 percent of Florida's wetlands had been lost when he went to work for the state in 1974.

"Then in the late 1960s we started to realize what an important role they played in cleaning the water, keeping fish alive, providing homes for animals.

"Government regulation cut down on destroying wetlands, and in the 1970s and early 1980s we focused on replacing those wetlands that were removed. Now we've come full circle to the point where we are actually creating new wetlands."

Most of Beeman's clients are large real-estate developers, many with residential golf course communities. One of Ecoshores' biggest projects was Hammock Dunes Private Community in Palm Coast, Fla.

The developer identified about 40 acres of functioning wetlands to be preserved. In addition, mosquito ditches and borrow pits were opened up and connected to the marshes and lakes to form a water management system.

A year later, the shorelines of lakes and marshes are flanked by cordgrass with dense root masses for effective erosion control and nutrient uptake.

In between the Tom Fazio-designed course's 10 lakes, Beeman created a series of artificial kidney marshes.

Storm and excess irrigation water passes through the man-made marshes, leaching out excess nutrients, pesticides and fertilizers before it reaches other waterways. Animals have already moved into the new wetlands.

Beeman's company used sea oats to restore and re-vegetate the community's five miles of oceanfront dune line that had been destroyed by nature and vehicles and eventually eroded by the waves.

"Sea oats put down a good root base and they act as a seed trap for all other dune plants and grasses growing in the area," Beeman said.

"Occasionally we plant saw palmettos and Spanish bayonets to discourage people from walking on the sea oat plantings."

Panic grass, dune sunflower, seagrape and sea purslane were also used to stabilize the sand dunes.

In addition to the ecological shot in the arm plants provide, they can also add a competitive challenge. At many of the courses he's planted,

Beeman has placed fresh-water cordgrass between the championship, men's and ladies' tees.

"You have to hit your ball over

them. You can't get away with a worm-burner. The cordgrass makes for a very attractive and abrupt border. It stays green most of the year and turns a bright, golden color in the winter. It's nice stuff," said Beeman.

Beeman charges anywhere from \$5,000 to \$15,000 an acre to install vegetated shorelines. But that is often cheaper than seawalls, bulkheads and the like, according to Roy B. Mann of the Austin, Texas, environmental consulting firm of RMA/Texas.

Mann has consulted on golf course projects in Texas and Mas-

sachusetts. Regardless of locale, Mann recommends a developer seek out a landscape architect with the following abilities:

- Proven design skills, especially regarding topography and existing tree stands.
- A strong understanding of the game.
- A grasp of slope and drainage requirements.
- A knowledge of turf installation and management.
- A thorough knowledge of waterway and wetland characteristics, including natural and man-made features.

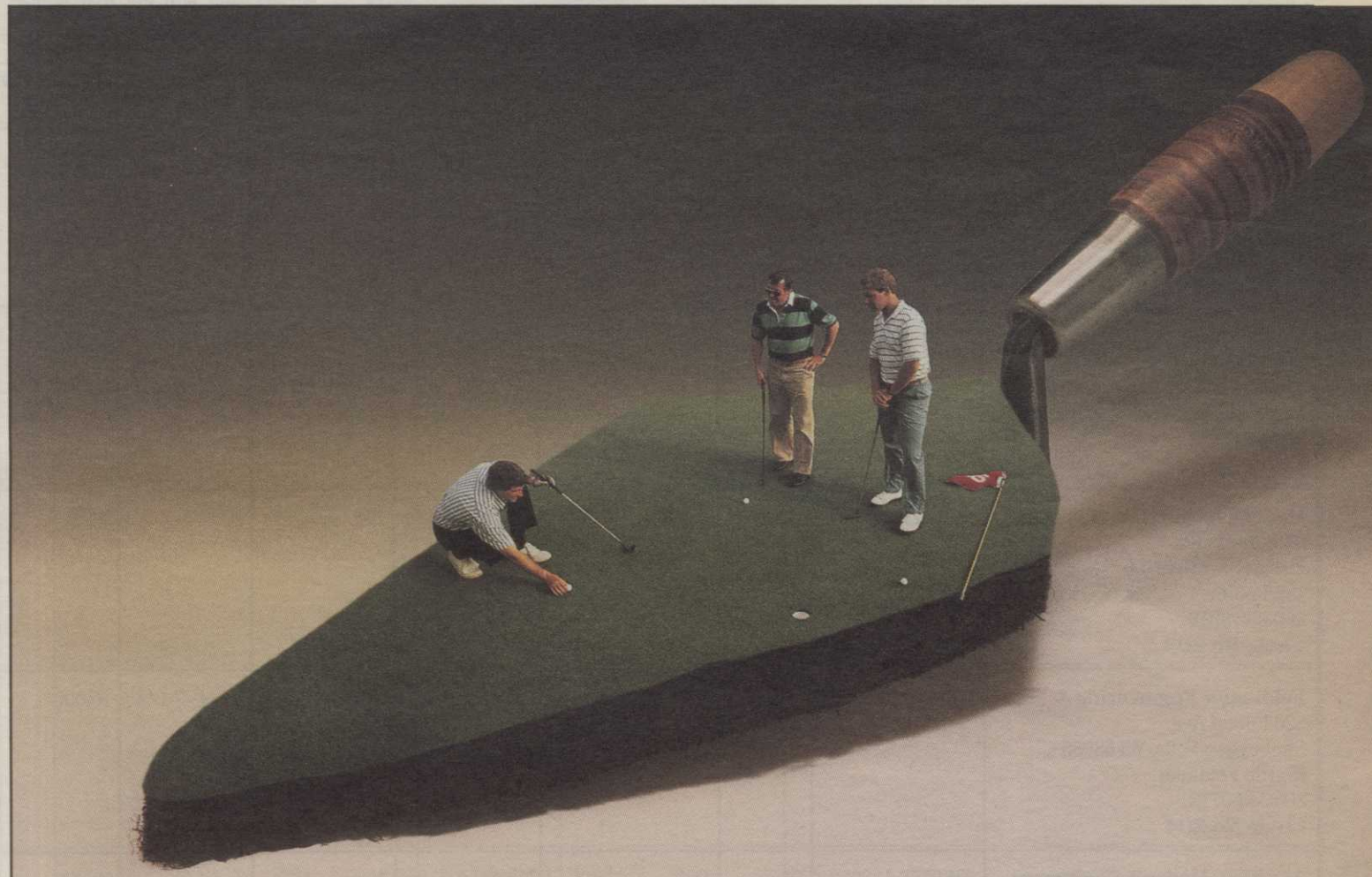
Antioch GC renovations under way

Renovations are underway and new homes planned for the Antioch Golf Course, formerly Harbor Ridge and Antioch Country Club, in upstate Illinois.

The golf management firm GreenVisions began a \$1 million-plus facelift of the 18-hole, public course in October.

That work is scheduled to be completed in May.

Also an additional 60 single-family homes and 50 townhouses will be built. The homes and sites should sell in the low \$200,000s.



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