What Goes Up Must Come Down

Innovation benefitting water and wildlife at The Villages of Sumter.

BY NANCY RICHARDSON

The floating mats consist of puzzle-cut pieces held together by nylon connectors. Mats can be assembled in any size or shape. Emergent aquatic plants are inserted into pre-cut holes and quickly establish extensive roots.

We often hear that statement made with satisfaction when someone has finally arrived at a solution to a pressing problem. Mark Twain looked at it a little differently. In Twain's view, "Necessity is the mother of taking chances."

That is exactly what golf course architect Ken Ezell, with Clifton, Ezell & Clifton Golf Design Group, did when faced with the common problem of fluctuating lake water levels at The Villages of Sumter, an Audubon Silver Signature project located in Sumter County, south of Ocala, Florida. Ezell took a risk that resulted in a whole new approach to managing water quality and wildlife habitat.

THE PROBLEM

The littoral shelf, or region of a lake, is the shallow area along the shoreline. Aquatic and shoreline plants in the littoral shelf serve a number of valuable functions. They provide wildlife habitat, filter runoff that might degrade water quality, and help cool lake water. When establishing a littoral shelf, aquatic and shoreline plants are selected according to water depth and wave action. And that's where the trouble with fluctuating water levels arises.

During Florida's rainy season, lake waters rise above their normal banks, flooding plants along the shallow margin. During dry months, water is drawn down for irrigation, causing aquatic plants to become too dry. Both conditions can kill desirable shoreline plants and result in the loss of investment of pond plantings.

At The Villages, the problem was multiplied by the sheer size of the project and the number of lakes and wetlands on the property. The Villages encompasses 13,000 acres of land, with 4,200 acres of open space that includes 1,995 acres of golf course, 840 acres of wetlands, and approximately 300 acres of lakes. The lakes not only serve as aesthetic features of the property, but also store water for irrigation and retain stormwater runoff during rain events.

As construction proceeded at The Villages of Sumter, the lakes continued

to fluctuate. With each new golf course and its associated lakes, the wait for lake levels to stabilize became long and frustrating. Necessity forced Ezell to think outside the box. So the question became: If you can't keep water levels from fluctuating, how can you fix the plants to fluctuate with the water levels?

A great blue heron takes refuge on one of the floating islands. More information on aquatic floating mats can be found at www.beemansnursery.com.

THE SOLUTION

The answer came from Beeman's Nursery in New Smyrna Beach, Florida. Owner Steve Beeman and his staff had been working on that very question for years.

"Over the past 20 years, the Beemans have been conducting experiments to devise a system that provides the benefits of vegetated littoral shelves without having to deal with the problems associated with changing water levels," explained Forest Beeman, vice president and production manager. "Using interlocking mats, combined with aquatic plants in perforated pots, we can suspend a simulated shallow water environment. This not only takes care of fluctuating water levels, but also produces oxygen, takes nutrients and pesticides out of the water, and provides habitat for wildlife."

The floating aquatic mats (U.S. patent pending) are anchored in the lake and are designed to move back and forth with the natural lowering and raising of water levels. The mat simply moves with the level of the water, depending on the amount of rainfall during each season. Mats are anchored with concrete weights to keep them from floating in and becoming rooted in the littoral zones, thereby defeating the purpose of their mobility.

"We initially thought that using increments of 1,000 to 2,000 square feet would be an ideal size for the floating islands," recalls Ezell. "What we found was that, in this situation, any size much more than 1,000 square feet was too large. The mats were pulled apart in high winds and shifting wave currents. We also learned that because the mats shift and move with wind patterns, securing them to prevent them from moving too close to shore is important."

FURTHER EXPERIMENTATION

With the use of the floating mats came another consideration: what to do with the vacant shoreline areas that would no longer have littoral plantings. To mitigate for the high and low fluctuations on the slopes, Clifton, Ezell & Clifton experimented with seashore paspalum, a salt-tolerant species of turfgrass, along the banks. Sod was laid on the 5:1 slopes to cover approximately four feet of vertical fluctuation. The paspalum has been remarkably successful at surviving periods of inundation as well as drought. The sod also eliminates the exposed bank and subsequent erosion that was experienced initially.

To date, more than one-half acre of aquatic floating mats has been introduced into eight lakes at The Villages of Sumter. Ezell is very optimistic: "As with all new experiments and innovations, there are kinks to be worked out. This floating aquatic mat system is no exception. We will continue to work with Steve Beeman and his staff to perfect this system because we have already seen that, once established, the result is an island bird sanctuary that produces multiple habitats while producing a healthier water system."

Born of necessity, risk-taking, and innovation, the aquatic mat system is working well at The Villages. We applaud the work of Ezell, Beeman, and the staff at The Villages for continuing to spearhead on-the-ground solutions that are improving the quality of our environment.

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