



Winston Trails, Lake Worth, Florida

A Case Study in Lake Restoration

by John Tight

What Are the Risks of Lake Erosion?

Many communities in Florida feature beautiful lakes that enhance the appearance of the neighborhood and offer recreational opportunities for the residents. Most of these lakes were originally excavated for very practical purposes: acquiring fill for construction, capturing stormwater, and storing water for irrigation. In addition to keeping these community lakes clean and functional, it is also important to maintain the shoreline and lake bank for safety purposes. Most lake banks are required to have slopes no steeper than four feet horizontal to one foot vertical. Unfortunately, the natural erosion of these lake banks is inevitable.

When the slopes become too steep, safety becomes an issue. For example, steep slopes dramatically increase the risk that someone may fall into the lake and be injured. The steep slope may also make it difficult for someone to escape from the lake's edge. Erosion can also cause areas around the shoreline to become unstable. Washouts and gullies can emerge in these unstable areas, creating further damage and risk. Given these safety concerns, the decision to restore a lake bank may not be optional—it may become a matter of compliance with local code requirements and a significant liability risk for the community.

What Causes This Erosion?

Lake bank erosion is caused by a variety of natural factors including:

- Continuous change in water elevation due to the change of seasons
- Strong winds can cause waves that damage the shoreline
- Stormwater runoff causes damage without proper drainage, especially when lake levels are low and the shoreline is exposed
- Fish, such as the armored catfish, can burrow into and may cause the collapse of lake banks

There are many other ways that a lake's shoreline can erode; however, there are steps that can be taken to restore and protect your lakes.

What Was the Problem at Winston Trails?

Winston Trails is a single-family home community in Lake Worth with almost 1,900 homes in 20 sub-developments. In 2007, Winston Trails began

to experience problems with lake erosion in some of the 28 lakes in their community. Homeowners complained that their backyards were "shrinking" as the lake bank eroded and the shoreline moved closer to their properties. Owners also reported visible gullies, exposed drainage pipes, and unstable lake banks.

Harold Hiller was the President of the board of directors of the Winston Trails Foundation at the time. The Foundation is the organization responsible for the overall maintenance and care of the common property in the community, including the lakes. "After doing some research and talking to other communities, we realized we needed to hire an expert to study the problem in more detail and make recommendations," says Hiller. The board hired Cheri Sova from Civil Solutions who conducted a thorough analysis of the lakes in the community. The report she provided identified a variety of problems including:



- Slopes that were too steep or likely to become too steep
- Washouts, gullies, collapsed lake banks, and unstable grounds
- Easement issues including patios, trees, and fences within 20 feet of the water's edge

According to Sova, "Nearly all of the lakes would need to be restored, or the erosion would continue and the problem would become worse." Sova's report identified the severity of the problems in each lake to help the board prioritize the work that would need to be done. Many possible solutions were discussed including:

- **Littoral shelf planting**—planting of native aquatic vegetation along the shoreline that would help fortify the lake bank. This would reduce and even prevent erosion from happening in the future. It is a relatively inexpensive solution; however, it would not fix the problem at hand.
- **Riprap**—a combination of rock and other material used to armor and protect the shoreline from erosion. This would fix the problem and likely prevent it from happening in the future. However, it is fairly expensive and was considered unattractive for the community.

- **Concrete Mat**—a concrete mat would be installed onto the slopes of the lakes. This would fix the problem, prevent further erosion, and is relatively inexpensive. However, it was considered very unattractive.
- **Bulkhead or Seawall**—lumber pilings, large rocks, boulders, or other materials stacked to form a wall on the lakeshore would fix the problem and prevent further erosion in the future. This option was considered to be too expensive and only moderately attractive.
- **Geotextile Tubes (Geo Tubes)**—large textile sand filled bags are placed along the shoreline and covered with sod, or other vegetation. This would fix the problem and prevent it from happening in the future. It was considered the most attractive and natural looking solution and was relatively inexpensive.

“The decision to use Geo Tubes was an easy one,” says Hiller, “it looked the most natural and the cost was reasonable.” Other communities had completed similar projects that resulted in a lake bank that looked good, was compliant, secure, and durable.

The Project

The restoration project was divided into two major phases. The first phase would take almost three years and would focus on restoring the highest risk areas that existed in 14 of the lakes. The first phase was estimated to cost about \$500,000 and was funded by a combination of reserve funds and a special assessment.

Coston Marine Services was hired to complete the first phase of the project and began installing the Geo Tubes in 2008. Coston also installed drainage pipes under the Geo Tubes to capture stormwater

from the gutters that might otherwise cause future erosion. The first phase of the project was completed on budget in 2011, and a recent inspection by Civil Solutions confirmed that the Geo Tube installation should hold up for many years to come. Civil Solutions also made recommendations for changes to enhance future installations.

Coston is in the early stages of beginning the second phase of the project, which is estimated to cost an additional \$500,000. Brad Bastien is the current President of the Winston Trails Foundation. Bastien is confident that the next phase will be a success and is happy with the progress, “The work from the first phase has held up well, and we are happy

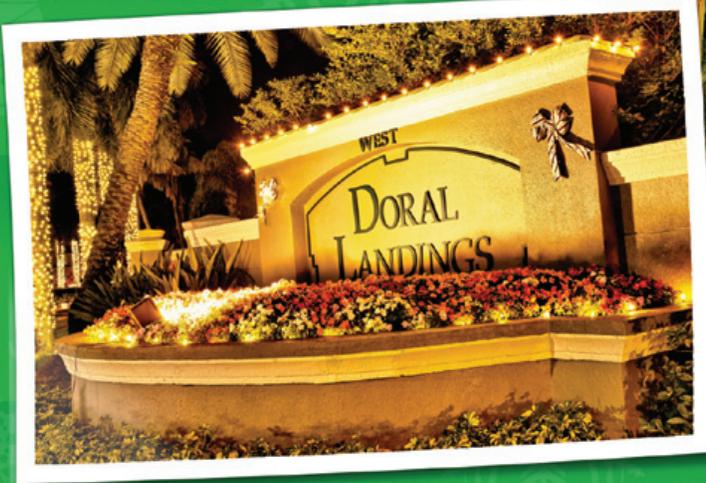
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that we addressed this issue early on.”

Lessons Learned

The board of directors at Winston Trails addressed their lake erosion problems early, which was critical to their success. By being proactive, they were able to address the problems before they became worse and would have cost much more to restore. This approach also allowed them to fund the restoration over a multi-year period, lessening the financial impact on homeowners.

The board also worked very closely with Civil Solutions to educate the community on why the project was required and why the Geo Tube solution was selected.

Preparing the community for the project work itself was also important. Paula Rappold of Campbell Property Management is the Property Manager at Winston Trails. According to Rappold, “there were very few complaints about the work done on the lakes.” The homeowners played a key role in completing the project by watering the new sod that was laid over the Geo Tubes and connecting their gutter downspouts to the underground piping system, which drained into the lakes.

This project was ultimately a success due to the coordination and cooperation among the board, homeowners, engineer, contractor, and the property management company.

John Tight is a Partner with Campbell Property Management with offices in South Florida serving Broward, Palm Beach, and Martin counties. For more information, please visit www.campbellpropertymanagement.com. ■

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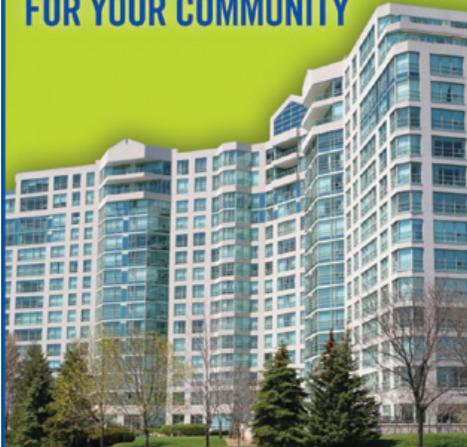
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