Cost Benefit of Groundwater-friendly Practices The Bear Trace at Harrison Bay, Harrison, Tennessee

Site Background

The Bear Trace at Harrison Bay is 350-acre, 18-hole Jack Nicklaus signature public golf course owned and operated by the State of Tennessee under the management of the Department of Environment and Conservation (TDEC). It is TDEC's Commissioner, James H. Fyke's, goal to operate The Bear Trace at Harrison Bay, one of 12 golf courses comprising the Tennessee Golf Trail, with the least impact upon the environment.

The golf course staff is responsible for maintaining the property to provide a championship golf course while protecting the surrounding environment and improving habitat for wildlife. Native plants and grasses are utilized on the golf course where applicable and drought and disease resistant turfgrasses are utilized.

The Bear Trace at Harrison Bay has earned many environmental accolades, including being recognized as a Certified Audubon Cooperative Sanctuary and recipient of the 2009 Governor's Environmental Stewardship Award for Excellence in Parks and Recreation. Harrison Bay has made many improvements in water conservation, water quality management, wildlife and habitat management, chemical use reduction and safety, and outreach and education. The course has installed 45 nesting houses, utilized native plants, and renovated the golf course's chemical storage facility. Forty acres of the course have also been naturalized to minimize maintenance and the turfgrass has been changed from bent grass to Champion Ultradwarf Bermuda grass, drastically reducing the course's chemical use and budget from $39,000 to $8,000 annually.

In addition, The Bear Trace at Harrison Bay has participated in the Groundwater Guardian Green Site program since 2009.

Going Native

"You only get one chance to make a first impression." It's an old saying but still rings true. The impression presented to the golfers at the first tee at The Bear Trace at Harrison Bay was a poor one. The cart path near this tee was sunken, which allowed water to puddle in an area where most golfers parked their carts. In addition, a planting bed was located along the right side of the teeing area to separate the first hole from the driving range and was full of overgrown and mismatched plants. Since this is the first tee and therefore the first impression of the course, staff decided a change needed to occur.

Staff decided to create a new planting bed comprised solely of plants native to Tennessee to act not only as an attractive addition to the golf course landscape, but also as an avenue to educate guests on the variety and benefits of native plants. Native plants are beneficial to the landscape because the plants are naturally adapted to the environment. They require less water, are hardier

in cold weather, more resistant to environmental stresses, and require less maintenance and inputs than landscape plantings containing introduced or exotic plants. Native plants provide shelter and food for wildlife, have an appearance of belonging in the landscape, and ultimately, save time and money.

The majority of the project was supported by the Iris Fund of the State of Tennessee. The Iris Fund is a program funded by the purchase of Tennessee State Park license plates; 100% of the purchase cost of the plate goes to the fund in which it is supporting. The Iris Fund provides money for Tennessee State Parks to improve their landscapes through addition of native plants, removal of exotic and invasive plants, restoration of shoreline and streamline banks, and structural support of planting which have native value. Detailed drawings of the planting bed were created and submitted to the Iris Fund committee for approval and additional funds and support were acquired from other departments. The project was completed at an overall total cost of $11,732.09.

Removal of the existing plant material from the area was the first step in the renovation. Any existing, desirable plants were moved to other locations on the golf course property, and the remaining plant material and old mulch was removed from the site. Salvaged railroad crossties were used to construct the retaining wall for the bed based on their ease of handling, cost, and rustic appearance. The retaining wall was built to a height of four feet and was constructed with eight “dead man runners” extending eight feet back into the bed and anchored with six-foot long one-inch rebar driven into the ground and then buried. Each layer of the wall is anchored to the lower layer with ½ inch rebar measuring 12 inches long driven every 4-5 inches down the wall. Proper wall construction was a necessity considering the pressure that will be exerted by the fill dirt that was placed behind the wall. Two recessed areas were also installed into the bed to place ball washers and trash cans. A geo textile fabric was installed along the back of the wall to keep any soil from coming out through the gaps in the crossties and to keep roots from occupying gaps and voids in the wall, which could lead to the weakening and failure of the wall.

An additional step taken during this process was to widen and replace the existing cart path which was sunken in two areas. The path was widened from eight feet to fourteen feet to allow for traffic to pass without either cart having to exit onto the turfgrass. Drainage was also a concern, so three eight-inch round catch basins were installed in the new asphalt with the asphalt sloping away from the tee boxes and toward the new retaining wall.

Once the wall was constructed, approximately 350 cubic yards of local fill dirt were brought in and packed behind the wall. A mixture of topsoil and sand was installed on the top foot to provide a better, more porous growing medium for the plants. Native plants were purchased, planted, fertilized and mulched. Additionally, a row of split rail fencing was placed at the rear of the planting bed to visually separate the area from the driving range located behind the planting area. Large natural stones were also placed in the bed to provide structure and texture, especially during the winter months when most of the plants will be cut back to the ground.

The native plants used were selected for their varying bloom time, color, texture, and height. All plants were grown by local nurseries to help ensure environmental compatibility, who assisted in

deciding which plants were appropriate for our situation with consideration toward sun and wind exposure, soil conditions, and desired limited maintenance input.

The planting project has provided us with an opportunity to introduce native plants to our golfers and guests who may not be familiar with the plants and could possibly incorporate similar plants into their home or business landscapes. Simple signs were installed in the bed near each plant grouping that act as a silent tour guide to the bed. Staff has observed several golfers jotting down the names of some plants.

Maintenance of the planting bed is very simple and low cost. Periodic deadheading of spent flowers, hand weeding, spot spraying of weeds, and yearly fertilizing with slow release fertilizer are the only maintenance requirements. Winter preparation for some varieties include cutting the stalks down to the ground and possible covering of the plant during any expected hard freeze or cold snaps.

Native plants will continue to be added to the course's landscape areas and to the clubhouse grounds. Staff plans on "mirroring" the bed installed on #1 tee with a similar bed on #10 tee in the near future, but using different plants to increase exposure to new varieties, and are also looking into the possibility of redesigning the existing clubhouse grounds to include native plants to be an educational garden for local garden clubs and schools, which will draw new visitors and customers to the course.

Paul Carter, CGCS and The Bear Trace at Harrison Bay State Park said, "Overall, I am very satisfied with the outcome of the project. We have taken an area of the golf course which was an eyesore and turned it into a beautiful and welcoming area. The assistance which I received from the Iris Fund and the Tennessee Department of Environment and Conservation was invaluable. The relative ease of the build and the numerous compliments which we have received made all the hard work worthwhile."

Visit http://www.tngolftrail.net/beartrace/harrisonbay/ for more information about The Bear Trace at Harrison Bay Golf Course.

Adapted with permission from "Going Native: Educating and Inspiring Golfers through the Creation of a Native Planting Bed" by Paul Carter, CGCS, Superintendent, developed for the Golf Course Superintendents Association of America's Environmental Institute for Golf.

Area at #1 tee prior to renovation

Retaining wall being constructed

Completed native planting bed