

Sanibel Golf Course Fertilizer and Lake Management Recommendations Annual Report Card



September 2015



This report was specifically prepared for:

Sanibel Island Golf Club

Introduction

Stormwater runoff from urban landscapes and golf courses is a major source of nutrients contributing to algae blooms and water quality impairments in Florida. Poor water quality not only impacts wildlife habitat and the quality of life for island residents, but it can directly impact our local economy by reducing property values and the overall experience of visitors to our island. As a result, protecting Sanibel's water quality is of paramount concern to the City of Sanibel.

The Florida Department of Environmental Protection (FDEP) is the state agency responsible for protecting Florida's waters. Waters that do not meet the state's water quality standards are deemed "impaired" under the Florida Impaired Waters Rule (Ch. 62-303, F.A.C.). To address these impairments, the FDEP is developing Total Maximum Daily Loads (TMDL) for each waterbody that does not meet minimum water quality standards. The TMDL is the maximum amount of a pollutant that a waterbody can assimilate on a daily basis without causing an imbalance in the natural flora and fauna. As part of the TMDL process, all local governments with impaired waterbodies within their jurisdiction will be required to participate in a Basin Management Action Plan (BMAP) process and will be required to address pollutant sources that are contributing to the impairment. It is anticipated that over the next few years a TMDL will be developed for the Sanibel River and the coastal waters surrounding Sanibel Island.

The City of Sanibel has taken several measures to improve water quality throughout the island. These measures include acquisition of environmentally sensitive lands, mangrove protection, native plant protection and sod limitations, beach and dune protection, conversion from septic to central sewer, responsible development through reductions in impervious surfaces and onsite stormwater management, implementation of the National Pollutant and Discharge Eliminations System Program, island-wide water quality monitoring, adoption of an urban fertilizer ordinance, and nutrient and lake management recommendations for golf courses. While the City has taken a very proactive role in improving water quality, the Sanibel River and many residential and golf course lakes on Sanibel remain "impaired" for nutrients such as nitrogen and phosphorus.

Managing stormwater runoff from golf courses on Sanibel is critical to ensuring that fertilizer and other chemicals used to maintain turfgrass do not inadvertently impact sensitive areas such as lakes, wetlands, and coastal waters. While we realize that each golf course is unique and was designed and permitted to function in a very specific way, all of the golf courses on Sanibel have the potential to discharge into natural waterbodies. As a result, the City has taken additional measures to ensure that water leaving golf course lakes meet the water quality standards of the receiving waters.

In October 2008, in an effort to improve the quality of water discharged from Sanibel's golf courses, City Council adopted a list of Nutrient Management Recommendations that were based on the Florida Department of Environmental Protection's *Best Management Practices (BMPs) for the Enhancement of Environmental Quality on Florida Golf Courses* (2008). These recommendations provide specific guidance for golf course managers on how to reduce fertilizer use and improve water quality within their respective golf course lakes. Since their adoption, City staff has worked closely with each golf course to provide technical assistance to help implement these recommendations.

The City Natural Resources staff met with Sanibel Island Golf Club (SIGC) superintendent Ed Lockard in August 2015 to review the City's Golf Course Nutrient and Lake Management program, tour the course, and provide guidance regarding implementation of the City's recommendations. As a result of that meeting, the City has updated the annual "report card" for the Sanibel Island Golf Club.

A report card is provided annually to each golf course to help track progress and guide implementation of the City's recommendations. The report card uses a point system to evaluate performance. Each recommendation or best management practice (BMP) is scored from 0 to 5, based on the completeness of implementation. Out of 13 BMPs, a maximum of 65 points can be earned. The score is calculated as follows: 0–80%, Not in Compliance; 81–90%, Partially in Compliance; and 91–100%, Full Compliance.

The Sanibel Island Golf Club earned **54 out of 65 points**, for a score of **83%**. The Sanibel Island Golf Club is "**Partially in Compliance**" with the City's BMP recommendations. **This is a 29% improvement since 2013 (under new ownership); but the same score as 2014.**

BMP Matrix / Staff Recommendation	Score
Education	
Require that each superintendent ensure that all course employees are trained in the <i>Best Management Practices for the Enhancement of Environmental Quality on Florida Golf Courses</i> (FDEP 2007), including water quality related issues and environmentally sensitive areas around the golf course.	5
Lake Management	
Within 5 years of adoption, a minimum of 30% of the littoral zone of each golf course lake must be planted and maintained with submerged or emergent aquatic vegetation on a minimum of 3' centers.	3
Require that golf courses monitor the water quality in their lakes 2x/year (wet season/dry season) and provide the data to the City's Natural Resources Department. Minimum parameters should include dissolved oxygen (DO), total nitrogen (TN), total phosphorus (TP), chlorophyll a (chl-a), and copper (Cu). If nutrient or heavy metal concentrations are excessive, City staff will meet with golf course management staff to review and determine a mitigation plan.	0
Require that all fish kills and algae blooms are reported to the City's Natural Resources Department.	4
Fertilizer Management	
Limit soluble nitrogen applications to ½ lb/1,000ft ²	5
Identify and map environmentally sensitive areas within the golf course and identify no fertilizer buffer zones around all of the waterbodies and map drainage patterns.	5
Require 25-foot native plant or unfertilized grass buffers around environmentally sensitive areas such as lakes and wetlands, where practical. When a 25-foot buffer is impractical, a minimum 10-foot buffer is required.	4
Require that grass buffers around environmentally sensitive areas such as lakes and wetlands be mowed 2" higher than the other grass to slow and filter overland flow to waterbodies.	5
Require that all washdown facilities have runoff properly treated prior to discharge off of the site.	5
Require periodic inspections of fertilizer storage areas and washdown facilities by DNR staff.	5
Require that all golf courses on the island maintain annual fertilizer and copper sulfate logs and make them available to the City's Natural Resources Department.	4
Irrigation and Fertigation	
Require that all reuse water be setback 25-feet from all waterbodies and that all irrigation heads using reuse water or fertigation (application of fertilizer through an irrigation system) be setback 25-feet from a waterbody. When a 25-foot buffer is impractical, a minimum 10-foot buffer is required.	4
Require that golf courses quantify their water use and differentiate between reuse and potable water supplies. This information can be used to account for the nutrients in reuse water when making fertilizer calculations.	5
Total Points (out of a maximum of 65 points):	54

Areas meeting the City's recommendations:

1. *Best Management Practices training for golf course staff.* SIGC achieved "full compliance" with the FDEP BMPs for Florida Golf Courses in January 2014. The program requires that all golf course employees be trained in the *Best Management Practices for the Enhancement of Environmental Quality on Florida Golf Courses*. Additional BMP training was held in February 2015. SIGC should ensure that annual training sessions include an emphasis on BMPs related to water quality and fertilizer management.
2. *Reporting of fish kills and algae blooms in golf course lakes.* No fish kills or algae blooms were reported over the past year. Several small-scale phytoplankton blooms were observed during the course inspection in August; however, no macroalgal blooms were observed in the golf course lakes or within the Sanibel River. Additional efforts should be made by golf course staff to identify and report all blooms to Natural Resources staff so that we may provide technical assistance on how to reduce possible nutrient sources and to mitigate future blooms.
3. *Limit soluble nitrogen applications to ½ lb N/1,000 ft².* Golf course staff has indicated that applications of soluble nitrogen are limited to ½ lb N/1,000 ft². This minimizes the potential for runoff of soluble nitrogen into lakes and subsequent availability to algae.
4. *Identify and map environmentally sensitive areas around golf course lakes.* Formal mapping was completed in May 2014. A map showing drainage patterns and all environmentally sensitive areas was provided to City staff on May 29, 2014.
5. *Require 25-foot native plant or unfertilized grass buffers or 10-foot buffers where 25-foot is impractical around environmentally sensitive areas.* At a minimum, 10-foot buffers have been established around most of the environmentally sensitive areas, including lakes and wetland areas. Additional buffers should be considered at edge of existing bulkheads.
6. *Require that grass buffers around environmentally sensitive areas such as lakes and wetlands be mowed 2" higher than other grass to slow and filter runoff.* Grass along the edge of lakes is allowed to grow to at least 2" higher than grass on greens, fairways and tees to help slow water and nutrient runoff. In most cases, the grass is allowed to grow much higher, aiding in filtration of runoff entering water bodies.
7. *Proper maintenance of washdown facilities and runoff.* The SIGC maintenance area and washdown facility were in good working order at the time of inspection and there were no signs of washdown water being discharged from the site.

8. *Allow City staff to conduct periodic inspections of golf course facilities.* SIGC staff has provided full access to the golf course and all of its facilities for inspections. During the most recent inspection, all fertilizer and chemicals were properly stored and the maintenance facility and washdown area appeared to be in good working order.
9. *Quantify golf course water use and the source of water used.* Sanibel Island Golf Club quantifies all water use. All water used to irrigate the course is reuse water provided by the City.

Areas needing improvement:

1. *Planting of shoreline vegetation along golf course lakes to facilitate nutrient removal.* Within 5 years of adoption of the City's recommendations, all golf courses should have a minimum of 30% of the shoreline of each lake vegetated with submerged or emergent aquatic plants. Because aquatic shoreline vegetation is one of the easiest ways to remove nutrients, it is critical that lakes be vegetated and a maintenance program be implemented to harvest 10-20% of the mature plants annually to help facilitate nutrient removal. At this time, a majority of the Sanibel River is buffered with native wetland vegetation and emergent shoreline vegetation; however, the lakes within the golf course have little or no emergent or submerged aquatic vegetation. Additional efforts should be made to install vegetation along the shoreline of all golf course lakes (minimum of 30%). In locations where establishing submerged or emergent aquatic plants is not possible, a native shoreline buffer should be created.
2. *Require that all irrigation heads using reuse water be set back 25' from all waterbodies or 10' where 25' is impractical.* The current irrigation design includes several heads that are located within 10' of golf course lakes and the Sanibel River. In 2014, SIGC replaced more than 25 full circle irrigation heads, some less than 10' from waterbodies, with part circle heads. However, during the course inspection, City staff observed at least one irrigation head spraying some reuse water into the adjacent lake at both ends of the 180 degree spray arc. This demonstrates the need for frequent inspections of the irrigation system to ensure that all heads are functioning properly. Buffer plantings should also be considered to help reduce the potential for malfunctioning heads spraying into sensitive areas. Constant attention to the irrigation system is critical to significantly reduce the volume of nutrient-rich reuse water entering golf course lakes and the Sanibel River.
3. *Water quality monitoring and reporting.* SIGC does not currently monitor water quality in any of the golf course lakes. The City of Sanibel collects monthly water quality data from the Sanibel River at two sites, one near Casa Ybel Road and one at the Donax WWTP. Additional data was collected by the City in 2014 as part of the City's Comprehensive Nutrient Management

Plan. The data will be used to identify nutrient loading hot spots in the area; and to provide baseline data for future comparisons with data collected by SIGC. SIGC has informed the City that water quality monitoring was conducted in early September 2015.

4. *Maintain annual fertilizer and copper sulfate logs and make them available to the City's Natural Resources Department.* Records of fertilizer purchases were provided to the City; however, detailed logs that identify the type and amount of fertilizer applied, location, and application dates are not maintained. Although at one time little to no fertilizer was used on the golf course, over the last year SIGC has increased its fertilizer use in order to improve turf condition. Fertilizer logs are necessary to document nutrient applications for proper golf course management and environmental health. SIGC no longer uses any copper sulfate to control algae blooms in the golf course lakes.

Interim goals for 2015-2016:

1. Complete the removal of Brazilian pepper from all areas of the golf course. The presence of Brazilian pepper on the property is a violation of the City's Brazilian Pepper Eradication Program. Removal of all other invasive exotic vegetation—including air potato, lead tree, exotic inkberry, oyster plant, umbrella tree, Christmas senna, and wedelia—is strongly recommended.
2. Implement water quality monitoring in golf course lakes at least 2x/year (wet season/dry season) and provide the data to the City's Natural Resources Department. (SIGC has informed the City that water quality monitoring was conducted in early September 2015; initiation of this sampling will be reflected in the 2016 report card.)
5. Maintain detailed fertilizer logs that identify the type and amount of fertilizer applied, location, and application dates. Fertilizer logs are necessary to document nutrient applications for proper golf course management and environmental health.
3. Install at least two areas (minimum 50-feet of shoreline) of submerged and emergent shoreline vegetation and transition at least two sections (minimum 50-feet in length) of shoreline from unmowed grass to native plant buffers. In 2013, SIGC ceased mowing the lake edges as an initial step in an improved lake management process. While this action was sufficient to bring SIGC into compliance with the specific report card recommendation, it has not necessarily created a desirable aesthetic and/or playability measure. It was also not intended as a substitute for the addition of submerged and emergent shoreline vegetation.

Additional Noteworthy Efforts:

- During the summer of 2015, SIGC removed 25 acres of turf from the course, reducing the need for fertilizer and irrigation in these areas. Some areas will be revegetated with native plantings that will provide wildlife habitat and water quality benefits.