

# Sanibel Golf Course Fertilizer and Lake Management Recommendations Annual Report Card



July 2013



This report was specifically prepared for:

**The Dunes Golf and Tennis 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 ensure that 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 meets 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 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 to help improve water quality within their respective golf course lakes. Over the past three and half years since their adoption, City staff has worked closely with each of the golf courses to provide technical assistance to help implement these recommendations.

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On July 10, 2013, City Natural Resources Department staff met with Leilani Sivsov, Club Manager, and Mitch Miller, Superintendent, of The Dunes Golf and Tennis Club to review the status of implementing the City's Golf Course Nutrient and Lake Management Recommendations. As a result of that meeting, the City has updated the Annual Report Card and shoreline vegetation map for the Dunes golf course (see attached documents). This Annual Report Card was developed for each of the island's golf courses to provide feedback on progress towards implementing the City's recommendations. This report will be provided annually to each golf course to help track progress and guide implementation.

This Report Card uses a point system to evaluate performance. For each recommendation or best management practice (BMP) implemented, 1-5 points are awarded based on the level of implementation. Out of a total of 13 BMPS, a maximum of 65 points can be awarded. The score is calculated as follows: 0 – 80% - Not in Compliance, 81 – 90% - Partially in Compliance, 91 – 100% - Full Compliance.

The Dunes Golf and Tennis Club received **60.5** out of a total of 65 points, resulting in a score of **93%**. This indicates that the Dunes golf course is in "**Full Compliance**" with the City's recommendations (see report card below for details). **This year's score represents a 30% improvement since 2011.**

BMP Matrix / Staff Recommendation	Score
<b>Education</b>	
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
<b>Lake Management</b>	
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.	4
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.	5
Require that all fish kills and algae blooms are reported to the City's Natural Resources Department.	5
<b>Fertilizer Management</b>	
Limit soluble nitrogen applications to ½ lb/1,000ft <sup>2</sup>	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.	4.5
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.	5
<b>Irrigation and Fertigation</b>	
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.	3
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):	<b>60.5</b>

**Areas currently meeting the City's recommendations:**

1. *Best Management Practices training for golf course staff.* In May 2011, The Dunes developed a formal BMP training program for golf course personnel. As of June 2013, all 13 employees have participated in the annual training and have acknowledged they have been trained and understand the basic principles of the *Best Management Practices for the Enhancement of Environmental Quality on Florida Golf Courses*.
2. *Water quality monitoring and reporting.* Since October 2008, The Dunes has collected water quality data on a semi-annual basis and has provided the results to City staff. This data is used by staff to help track water quality in the golf course lakes. Since April 2012, The Dunes has contracted with the SCCF Marine Lab for water quality monitoring services. Monitoring includes water quality sampling, storm event sampling, mapping of drainage patterns, and recommendations on how to improve water quality in the golf course and community lakes. The first annual report was submitted in February 2013.
3. *Reporting of fish kills and algae blooms in golf course lakes.* All fish kills (1) and algae blooms were reported to City staff.
4. *Limit soluble nitrogen applications to ½ lb/1,000 ft<sup>2</sup>.* Golf course staff has indicated that they currently limit application of soluble nitrogen to ½ lb/1,000 ft<sup>2</sup>. This minimizes the potential for runoff of soluble nitrogen into golf course lakes available to algae.
5. *Identify and map environmentally sensitive areas around golf course lakes.* Formal mapping was completed in July 2012. A map showing all environmentally sensitive areas was provided to City staff on June 14, 2012. A map showing drainage patterns was provided in SCCF's first quarter monitoring report (July 5, 2012).
6. *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 installed along bulkheads where feasible.
7. *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 is allowed to grow at least 2" higher than grass on greens, fairways and tees to slow water and nutrient runoff. Additional buffers should be installed along bulkheads where feasible.
8. *Proper maintenance of washdown facilities and runoff.* The Dunes 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. The retention area where washdown effluent is held should be excavated to reduce organics and increase capacity in the upcoming year.

9. *Allow Citystaff to conduct periodic inspections of golf course facilities.* The Dunes staff has been very cooperative and has provided full access to the golf course and all of its facilities for annual 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.
10. *Maintain and make available fertilizer records and copper sulfate logs.* The Dunes maintains annual fertilizer and lake management records, including copper sulfate logs. This data was made available to City staff.
11. *Quantify golf course water use and the source of water used.* The Dunes quantifies their 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 are supposed to 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 each lake be vegetated with submerged or emergent vegetation. Once established, a maintenance program should be implemented to harvest 10-20% of the mature plants annually to help facilitate nutrient removal. Over the past three years, The Dunes planted a significant amount of shoreline vegetation. In 2012, more than 2,500 linear feet of emergent vegetation was installed along holes #13, #14, and #15; however, due to high salinities caused by tidal water flowing into the lake over the weir, almost none of the plants survived. While emergent vegetation has been difficult to establish, the Dunes has ceased herbicide treatment of the lake vegetation and submerged aquatic vegetation, primarily widgeon grass, has colonized a large portion of the lake shoreline. Staff should continue to exclude herbicide treatment of the lakes and continue efforts to establish emergent vegetation to meet the minimum 30% shoreline vegetation requirement within all lakes where high salinity is not a concern.
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 waterbodies and sensitive wetland areas. The Dunes staff, often informed by concerned residents, closely monitors these irrigation heads to prevent re-use water, also contains fertilizer (fertigation), from spraying directly into golf course lakes; new sprinkler heads are kept on-hand allowing for immediate replacement of malfunctioning heads. A complete redesign of the irrigation system would be needed to move heads a minimum of 10' from all waterbodies. However, a new central irrigation computer was installed in July 2012, significantly improving irrigation efficiency.

### **Progress on 2012–2013 Interim Goals:**

1. *Continue planting of emergent aquatic vegetation in lakes where salinity will not inhibit growth. The lake shoreline along holes #5, 6, 7, 8, 9, 10, 11, 16, 17, and 18 should be planted with suitable emergent aquatic vegetation.*  
Progress: Incomplete. The Dunes staff has been reluctant to plant additional emergent vegetation, as previous efforts have been relatively unsuccessful. However, significant shoreline improvement has been achieved simply by reducing/eliminating shoreline mowing and discontinuing herbicide treatment within the lakes, allowing native submerged aquatic vegetation to establish. However, it is important that The Dunes continue efforts to establish emergent vegetation. Success may be improved by using cuttings from already established emergent vegetation or employing alternative planting strategies, such as a “Beemat” or other managed aquatic plant system.
2. *Additional buffer zones along the bulkheads should be considered in order to meet the minimum 10-foot buffer requirement. This could be achieved by slightly reducing the grade adjacent to the bulkheads and allowing turf to grow to a minimum height of 2” higher than surrounding turf.*  
Progress: Incomplete. The Dunes has installed some planting beds of exotic Lantana camera in areas adjacent to bulkheads and at some tee boxes. While the intent is good, planting these areas with native groundcover species, rather than exotics, is highly recommended. In areas where a 10-foot buffer is not feasible, alternative planting strategies, such as a “Beemat” or other managed aquatic plant system, should be considered.
3. *The retention area adjacent to the maintenance facility where the washdown effluent is held should be excavated to reduce organic material and increase capacity.*  
Progress: Incomplete. The Dunes staff has assured the City that this will be completed this fall.

### **2013-2014 Interim Goals:**

1. Excavate the retention area adjacent to the maintenance facility where the washdown effluent is held to reduce organic material and increase capacity.
2. Continue efforts to plant emergent aquatic vegetation in lakes where salinity will not inhibit growth. The lake shoreline along holes #5, 6, 7, 8, 9, 10, 11, 16, 17, and 18 should be planted with suitable emergent aquatic vegetation.
3. Additional buffer zones along the bulkheads should be considered in order to meet the minimum 10’ buffer requirement. This could be achieved by slightly reducing the grade adjacent to the bulkheads and allowing turf to grow to a minimum height of 2” higher than surrounding turf or by creating planting areas of native or non-invasive exotic groundcovers. Installation of a “Beemat” or other managed aquatic plant system could provide benefits in areas where buffers are not feasible.

### ***Noteworthy Achievements***

- Removal of exotics and installation of extensive native vegetation, primarily *Spartina* and sea-oxeye daisy, along holes 13 thru 17, is providing additional buffering between the golf course and adjacent mangrove wetlands (SCCF conservation lands).
- Working with the SCCF Marine Lab in cooperation with golf course management, The Dunes Homeowner's Association (HOA) has undertaken a number of pilot projects to address lake nutrient pollution, including:
  - Installation of a "Beemat" managed aquatic plant system;
  - Withdrawal of water from Horseshoe Lake for residential lawn irrigation;
  - Harvest of exotic fish from Horseshoe Lake.

These projects are evidence of the commitment both the golf course management and the HOA have made to improving water quality in the lakes at The Dunes.