



Manatee Cove Golf Course
Environmental Baseline Assessment
Patrick AFB, Florida Apr 02



Executive Summary

U. S. AIR FORCE GEM PROGRAM GOALS

The U. S. Air Force Golf Course Environmental Management (GEM) program is a proactive Air Force Center for Environmental Excellence (AFCEE) initiative to foster a better understanding of the environmental challenges facing our golf courses worldwide. Armed with the support and approval of the Air Force Services Agency golf program, AFCEE's goal is to facilitate the creation of an environmentally friendly golf course facility while supporting the mission.

The primary tenets of the GEM Program are to minimize or eliminate potential negative environmental impacts, attain and maintain daily compliance with all appropriate regulations, and constantly examine our processes on all aspects of golf course management to achieve the highest standards of environmental excellence.

GEM PROGRAM PROCESS

There are five steps in the GEM program process.

- Analysis
- Documentation
- Implementation
- Evaluation
- Revision

This report is the result of the analysis step.

MANATEE COVE GOLF COURSE PATRICK AFB, FLORIDA ENVIRONMENTAL CHALLENGES

The following environmental challenges were identified during the GCEBA process:

- Invasive exotics
- Audubon Cooperative Sanctuary Program
- Housing privatization
- Bird/Wildlife Aircraft Strike Hazard (BASH)
- Threatened & endangered species
- Water quality management

Additional information on the environmental challenges at Manatee Cove Golf Course can be found in the Conclusion of this Golf Course Environmental Baseline Assessment.

WHERE DO WE GO FROM HERE?

The golf course staff should determine their preferred management approach for the challenges above in context with their ongoing goals of providing the best golfing experience for the money. They should then coordinate these practices with the installation environmental staff to ensure their compatibility with installation wide natural resources and environmental goals and objectives followed by implementation.

Table of Contents

Introduction	1
Program Process	2
Course Specific Analysis	5
Miscellaneous Facility Review	26
Overall Management Philosophy & Documentation	32
Safety, Training, & Awareness	34
Compliance.....	36
Course Playability	38
Pollution Prevention	40
Conservation Practices.....	42
Aesthetics & Naturality	44
Maintenance Practices	46
Customer Relations & Education	48
Miscellaneous Special Projects & Activities	50
ECQ Summary	52
GCEBA Results	52
Conclusion.....	53
Bibliography	58

Introduction

The golf course environmental baseline assessment (GCEBA) is the initial step in the process of creating a successful ecosystem-based Golf Course Environmental Management (GEM) Plan.

The ultimate intent of the program is to provide a foolproof, customer-driven management tool that will free up course managers and superintendents to devote more of their efforts to caring for their customers and the course. Properly designed and implemented, the GEM Plan will keep the facility in compliance with the ever-changing environmental rules and regulations while providing a vital recreational opportunity for the installation.



Water bodies dominate the landscape at Manatee Cove.



Invasive species like the melaleuca are a growing issue at Patrick AFB.

Goal of the GEM Program

The goal of the U. S. Air Force GEM program is to facilitate the creation of an environmentally friendly golf course facility for its customers while supporting the installation mission. The Air Force Center for Environmental Excellence (AFCEE) is dedicated to helping to identify ways that more rounds can be played on better-conditioned courses while minimizing or eliminating negative impacts to the environment. In most cases, the U. S. Air Force's golf courses are being managed compatibly with the environment. The GEM program is the vehicle to document our successes while communicating directly with the golfers, our commanders, and the local community.



Golf is just one of the many recreational opportunities in the area.

Program Process

Implementation is the most important phase of any initiative where practices and procedures are examined and may undergo significant change. This is especially true of the GEM Plan process. The specifics for the GEM Plan components and directions for their completion will be delineated in AFCEE's ***Golf and the Environment, Guidelines for the 21st Century.***

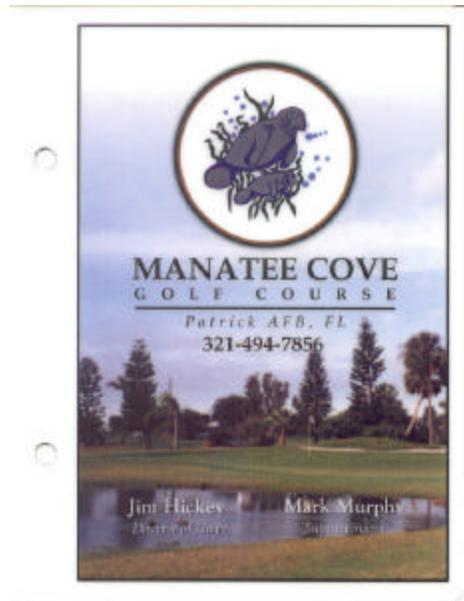
The GEM Program is derived from many diverse environmental regimes such as the National Environmental Policy Act, the Environmental Compliance Assessment and Management Program, and the ISO 14000 environmental management system. The primary tenets of the GEM Program are

to minimize or eliminate potential negative environmental impacts, attain and maintain daily compliance with all appropriate regulations, and constantly examine our processes on all aspects of golf course management to achieve the highest standards of environmental excellence. There are five basic steps in the implementation of the GEM Program process:

- Analysis
- Documentation
- Implementation
- Evaluation
- Revision



Several large waterfowl visit the many lakes and ponds on the course.



Analysis

Experienced environmental managers realize the importance of assembling all of the data relevant to a problem prior to determining its best solution. Analysis is the first and most important task of the golf course environmental baseline assessment (GCEBA) and the GCEBA is the initial step in the process of creating an ecosystem-based Golf Course Environmental Management (GEM) Plan. Properly completing the GCEBA is paramount to the long-term compatibility of an installation's golf course management practices with the GEM Program, and more importantly, the U. S. Air Force's natural resource and environmental management goals and objectives.

GCEBA COMPONENTS

The GCEBA is comprised of the following components:

- Site visit, interviews, and data collection
- Course specific analysis
- Miscellaneous facility review
- Environmental compatibility quotient checklists
- Identification of environmental management challenges
- Summary report

Documentation

It is not enough just to know how to create a successful golf course environmental management program. There has to be a written record of existing site data, maintenance practices, pesticide applications, and other historical golf course activities. By documenting what we know, we will be able to determine how to make better decisions in the future. The completed GEM Plan will be a comprehensive report with a map that will assist in the daily management of the course while providing a convenient vehicle to communicate to our customers the environmental issues that challenge us on our golf course and our plans to deal with them. In order to reach the environmental stewardship goals set by the U. S. Air Force, we must consistently employ only those management practices that minimize or eliminate potential negative impacts to the environment.

GEM PLAN COMPONENTS

The GEM Plan will be comprised of the following components:

- GCEBA report
- Map of the entire golf course facility grounds depicting locations of the significant environmental management challenges and the golf course facilities
- Booklet that describes the environmental management challenges on the GEM Plan map
- Specific practices that will be employed by the golf course staff to deal with each environmental management challenge after coordination with and approval by the installation environmental staff
- Compilation of best management practices employed at the golf course in their implementation of the GEM program recommendations

Implementation

Positive and decisive action is the only true measure of the success of a GEM Program. By implementing new practices, whether to knowingly improve the course's role in the environmental stewardship of the installation or to just try new ideas to determine their value, will the golf staff and golfers benefit. The Manatee Cove staff should adopt the GEM Program Environmental Policy and immediately begin finding ways to minimize or eliminate any and all negative impacts to the environment.

Evaluation

In order to ensure the highest quality of customer service and environmental stewardship, there must be continual self-evaluation and improvement. There also should be consistent, on-going measurement of the reduction or elimination of environmental impacts the newly implemented practices have on the course. For example, documenting the reduced use of inputs such as fertilizers, pesticides, and irrigation can be used to demonstrate the increased environmental stewardship of the golf course management practices as well as the overall value of the GEM Program. It is important for U. S. Air Force golf courses to show improvement over time. This can be easily accomplished by regularly evaluating golf course maintenance methods, practices, and management approaches to day-to-day issues and changing when appropriate.

Revision

The very nature of a superior GEM program implies that all documents be regularly maintained to represent the most current conditions. U. S. Air Force golf course managers and superintendents should be constantly looking for ways to improve their environmental stewardship. Acting on lessons learned is right behind initial implementation as the most important aspect of a successful GEM Program. The GEM Plan should be kept as current as possible at all times. Ideally, it should be completely updated at least every three years.

Course Specific Analysis

One of the most pragmatic and enjoyable tasks in the GCEBA process is the course specific analysis. From a general overall description of the course to the details of the course's history and makeup to the various observations on the way the course plays, looks, and is managed, the course specific analysis sets the stage for the rest of the GCEBA report. It is comprised of the following tasks:

- Course description
- Course details
- Hole-by-hole analysis with observations
- Maintenance facility evaluation
- Miscellaneous facilities examination



Manatee Cove features large greens and wind-pruned trees.

Course description

Patrick AFB's Manatee Cove Golf Course provides a high quality golf experience for more customers than any other 18-hole Air Force facility. At their current pace, Manatee Cove will record over 75,000 rounds this year.

Challenging and extremely playable, the Robert Trent Jones-designed course is nearly 7000 yards from the back tees. Typical of most Florida layouts, the course is lacking in major elevation changes or contouring. In keeping with Trent Jones, Sr. tradition, the greens at Manatee Cove are large and rolling to test the golfers as well as to allow several pin locations to accommodate the heavy play.

Jim Hickey and his staff not only must deal with a large amount of wear from the faithful, returning customers, they are in a constant fight against salt buildup in the soil profiles. The Atlantic Ocean is not far from the course's boundary on the east as well is the brackish Indian River to the west. Seemingly non-stop winds buffet the grounds around the clock.

If anything, the Manatee Cove Golf Course is a great success. Expertly managed facilities, friendly staff, quality recreation values, and a wonderful, year round climate conducive to golf is the not so secret recipe employed by Mr. Hickey, possibly the most positive person in the state of Florida. We all look forward to our next round at Manatee Cove.



Manatee Cove's excellence starts here.

Course details

Architect	Robert Trent Jones, Sr.
Year constructed	1961
Climate	Warm, humid, tropical
Average annual rainfall	56 inches
Average growing season	335 days per year
Winds/Prevailing Direction	North/East/South
Total Facility Acreage	286
Par	36-36-72
Yardage/Rating/Slope	Blue- 6947/73.2/128 White- 6584/71.6/124 Gold- 6344/70.5/122 Red- 5693/73.7/126
Golf course manager	Jim Hickey
Superintendent	Mark Murphy
Turfgrass	Tifway 419 Bermudagrass
Tees	Tifway 419/Com.Bermuda
Fairways	Tifdwarf 328 Bermuda
Greens	Bahia/Com. Bermuda
Roughs	



The simple addition of a few logs serves local wildlife well.

Hole-by-hole analysis & observations

This section begins with a short description of each hole and how it is played. Observations on course playability, aesthetics, and environmental management issues are compiled as a reference point for recommendations for improvement as well as positive reinforcement on worthy characteristics or practices. Overall trends can be identified by comprehensively examining the various observations noted for each hole.

The hole-by-hole analysis section provides a convenient vehicle to enable visitors, commanders, prospective golfers, or interested community members to more readily visualize the course.



Manatee Cove Golf Course

Hole #1- 331 Yards, Par 4

DESCRIPTION

Deceptively simple start to another enjoyable round, the short dogleg right first hole offers plenty of room for the less than accurate player while requiring three good shots for the more accomplished player to start with a birdie. Even a well-placed tee shot, which should leave a short iron approach, doesn't ensure a good score, as the green is small and well-contoured.



Wide open and inviting, the first tee offers little insight into demands ahead.



OBSERVATIONS

- Improve signage at first tee to announce playing conditions, cart driving rules, or planned spraying operations during the days play
- Added trees to the far right side will make the hole much better
- Invasive exotics have a foothold around the green
- Less than ideal dumping area left of fairway

Hole #2- 343 Yards, Par 4

DESCRIPTION

Quality dogleg left two-shotter! Manatee Cove doesn't allow much chance for a player to warm up before the fun begins. A great driving hole, the fairway gently bends around one of the many water hazards on the course. Seasoned players will not try to cut the corner too closely as any shots near the cart path may potentially get wet. Vegetative backdrop behind green assists players with club selection and shot visualization while nicely framing the green. Sand bunker on left side of green rarely is in play.



The 2nd requires a solid tee ball that moves gently from right to left.



OBSERVATIONS

- Additional trees on right side of fairway could help define landing area
- Brazilian peppers, a particularly aggressive and hardy invasive exotic, populates entire area behind green

Hole #3- 197 Yards, Par 3

DESCRIPTION

Long, difficult par three. The 3rd is probably too early in the round and too long for most of Manatee Cove's regulars to reach the green from the "white" tee. With regularly stout prevailing winds howling across the hole, the best shot for hitting it close may be a low runner that skirts the bunkers on the right front side of the green.



Not many visual clues on this forbidding one shotter.



OBSERVATIONS

- New forward tee could help the over 70 crowd who probably play the hole like a short par 4
- Regular tee needs expanding to minimize wear
- Remove old cart path short and right of green
- Need trees near the tee for shade

Hole #4- 541 Yards, Par 5

DESCRIPTION

A sharp dogleg left, the par 5, 4th offers a stout challenge to even the longest of players. Sand bunker on the corner of the tee shot landing area can be carried offering an opportunity for the fit to try for the green in two. Fair way becomes increasingly pinched between two of many water bodies at Manatee Cove. Second shot lay-up area is relatively wide open while the green provides an accessible target with bunkers in front and right to spice things up a bit.



The 4th green as seen from the fairway.



OBSERVATIONS

- Native trees along entire hole could help with definition and playability
- Safety problem due to wide open shared rough area with the 8th hole
- Cart path curbing needs to be continuous to protect important playing surfaces

Hole #5- 154 Yards, Par 3

DESCRIPTION

Good hole! This type of medium length par 3 should be utilized more often. The 5th offers ample challenge to all levels of golfers. The green is severely sloped, yet fair and it is appropriately sized for the hole's length. Lack of variety and movement in the groundplane makes for a less than attractive one shotter.



Visual clues are lacking on this relatively featureless one shotter.



OBSERVATIONS

- Lack of curbing on cart path allows inappropriate circulation patterns
- Teeing ground turf quality could be improved
- Trees could be added behind green for shade and to aid depth perception
- Hole needs contouring to improve appearance

Hole #6- 444 Yards, Par 4

DESCRIPTION

The 6th is the toughest hole on the course at 461 yards from the back tee. Usually played into the prevailing easterly Atlantic winds, the hole starts near another of the many ponds on the course and plays long from any tee chosen by the player. The ideal tee shot bends slightly left to right to the center of the short grass although the entire landing area appears wide open. Few trees populate the landscape and fewer do much to influence play of the hole. Approach shots are regularly undertaken from well over 200 yards from the green. A good “par 5” for most of the members!



Green is over 220 yards from these small mounds along the left rough.



OBSERVATIONS

- Need more trees to define tee shot landing area
- Memorial in far left rough is oddly sited
- Cattails in pond near teeing ground intimidate the lesser talented players
- High percentage of tree species are invasive exotics
- Great golf hole from beginning to end

Hole #7- 374 Yards, Par 4

DESCRIPTION

The dogleg left 7th is a sleeper. From the tee, the inexperienced Manatee Cove player is seemingly encouraged to cut the corner of the dogleg only to be “rewarded” with an approach the now must carry the pond when the pin is cut on the far left side of the green. The best line off the tee is right center of the fairway. Another pond cuts into the greenside turf on the right making this an interesting test of the player’s skill. One of the best holes on the course!



Approach shot must be carefully played at the 7th for birdie chance.



OBSERVATIONS

- Additional trees inside the cart path will help define the tee shot landing area
- Knobby mounds in front of green add visual interest as well as difficulty to recovery shots
- No curb along cart path at tee
- High traffic areas need additional care
- Cattails are extremely dense in pond near green

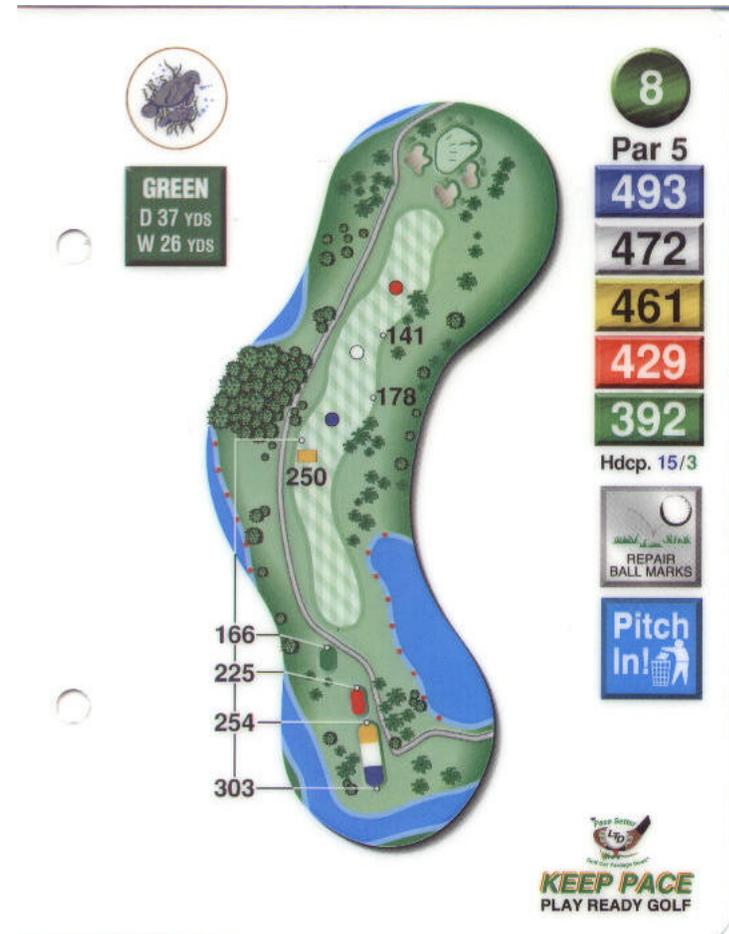
Hole #8- 472 Yards, Par 5

DESCRIPTION

Finally, Mr. Jones relents and gives the player a welcome respite from the absolute demands of brute strength and uncanny precision! All the player needs off the tee is slightly fading 250 yards or so to set up an easy, maybe even 2-putt, birdie. A good hole that is fair to all levels of players, the 8th sharply doglegs right between the seemingly ever-present water hazards at Manatee Cove. The green is well protected by three sand bunkers, short left and right, so players are still tested on their approach shots.



Sand bunkers protect the green putting a premium on accuracy.



OBSERVATIONS

- Enhance the demands of the tee shot by placing a large grove of palms on right edge of fairway about 220-250 yards from the green
- Large mass of vegetation left of tee shot landing area is probably 75% or more invasive exotics

Hole #9- 381 Yards, Par 4

DESCRIPTION

Unfortunately, the 9th is a non-descript finish to the front side. Little to no definition for the location of the ideal tee shot confounds some players while enticing others to swing from their heels without concern. In the end, the tee shot can be just about anywhere except behind one of the spindly trees to have an open approach and a chance at a birdie or easy par. Pond tries to embrace the left side of the green but is largely not in play for most of the Manatee Cove regulars.



Tee shot is wide open with minimal clues where to place the tee shot.



OBSERVATIONS

- Plant trees along the left side of the fairway and replace exotic species
- Wear area between cart path and ball washer at the tee
- Small safety hazard to players coming off the 2nd
- Hole features one of the best looking trees on the course, unfortunately it is an exotic Chinese tallow

Hole #10- 391 Yards, Par 4

DESCRIPTION

Inward nine gets off to a great start with this straightforward, medium long par four. Tee shot must be hit solidly to set up medium iron approach to green guarded on the left side by another pond. A yawning sand bunker on the right front edge of the green swallows many a weak approach. Although the hole has a lot of playing space, good scores are rare confirming its rating as the third toughest on this side.



Expensive sago palms are used for 150-yard markers.



OBSERVATIONS

- More than a single row of trees should populate the sides of the tee shot landing area
- Nice Norfolk Island pine tree green backdrop
- Irrigation leak near front right side of green needs attention

Hole #11- 531 Yards, Par 5

DESCRIPTION

Three solid, straight shots may reward the able player with a chance at a birdie on this slight dogleg left par 5. The entire right side of the landing area is lined with exotic vegetation that functionally screen the course's maintenance complex. Another one of Manatee Cove's water bodies, this time more like a canal than a pond, embraces nearly the entire left side of the hole until it turns sharply away at the green. A large sand bunker protects the short, left front of the green. Otherwise, the hole lies unguarded.



Unlike many of the holes here, there is definition from the tee.



OBSERVATIONS

- Begin to consider long term replacement of exotic species along right side of fairway that currently screens the maintenance complex from the player
- Lack of change in elevation of the groundplane makes this hole relatively dull and lifeless

Hole #12- 326 Yards, Par 4

DESCRIPTION

From the tee, the 12th hole looks like an easy birdie just waiting to be claimed. Yet the tee shot demands accurate placement and precise yardage to find the ideal location for the approach. Once again, a canal-like pond snakes along the entire left side of the fairway leaving the right side looking relatively open. Two bunkers guard the slightly elevated green that makes up one of the best green complexes on the course.



The approach shot must carry the bunker to the elevated green.



OBSERVATIONS

- Increase definition of the landing area and screen the right side with trees and palms
- Great green complex design with superb aesthetic and shot values
- Nearly all of the existing trees are exotics
- Minimal pin placements available due to severely sloping green adds stress to turf

Hole #13- 424 Yards, Par 4

DESCRIPTION

Lucky thirteen is the longest par four on the inward nine. Interesting mounding on right side of landing area encourages drives to stay just left of center. Fairway begins its slight tilt to the left just about where the tee shots land. Unbelievably, there are no ponds in play on the 13th. Sand bunkers guard the medium sized green both front right and back left. Good hole for the low handicapper, extremely tough hole for everyone else.



View from the fairway after a successful drive.



OBSERVATIONS

- Mounding pinches tee shot landing area while adding interest and diversity is a great example of the type of improvements many of the holes could employ to enhance shot values
- Railroad ties in front wall of greenside bunker probably intimidates many of the regulars

Hole #14- 185 Yards, Par 3

DESCRIPTION

The 14th is a medium to long three-par that allows the golfer to play a run up shot as the front of the green is unguarded and relatively flat. Green is narrow yet deep and is guarded by a two sand bunkers, both left and right. Norfolk Island pines frame the tee shot but there is no background to assist the player. Probably at least a full swing with a large-headed metal club for most of the Manatee Cove faithful to reach the dance floor.



Norfolk Island pines frame the tee shot nicely.



OBSERVATIONS

- Good start on attractive landscape development near teeing ground
- Teeing area borders on being too small
- Vegetative backdrop behind green would add a lot to the aesthetics as well as the playability of the hole

Hole #15- 569 Yards, Par 5

DESCRIPTION

A true 3-shot par 5, the 15th measures nearly three-eighths of a mile from the back tees. Water hazards hug the entire right side of the hole and appear mostly out of play until that fateful splash quashes a chance for a good score. The green is relatively small and has two sentry-like sand bunkers pulling duty along the right side to snag less than solid, inaccurate shots.



Just getting to the green at the 15th is a test.



OBSERVATIONS

- Add trees for interest and increased difficulty
- Green is proportionally sized for the average length approach shot
- Exotic vegetation dominates
- Too long and too straight to be interesting

Hole #16- 155 Yards, Par 3

DESCRIPTION

The course begins its return to the clubhouse with three good holes. The 16th is a testing, medium length par 3 that is made more visually interesting and psychologically tougher than it actually plays with the attractive and forbidding water feature down the entire length of the hole. Probably qualifying as Manatee Cove's signature hole, this hole is both beautiful and fun to play. When the pin is tucked behind the water hazard on the left side of the green, the player is enticed to increase the risk of a wet outcome by trying to get close for a chance at the elusive birdie.



Beauty, risk, and potential reward make the 16th a great hole.



OBSERVATIONS

- This is a great location for extra landscape development with the hole's location at the highly visible entrance to the course
- Much like most par threes, the teeing area needs expanding to minimize wear and tear on turf
- Irrigation sprinklers throw into the water hazard
- No curb along cart path around tee or green

Hole #17- 365 Yards, Par 4

DESCRIPTION

This dogleg left par 4 has another one of the ever-present water hazards just right of the tee shot landing area. There is plenty of room on the left side though, limiting the hole's potential quality. The tiny, sloping green exacts the best a player has to offer on the approach. With a little modification, this hole could be great.



Approach shot must carry bunker to set up birdie attempt.



OBSERVATIONS

- Hole suffers from lack of definition on left side of fairway
- No contour in fairway to add to the examination
- Do not plant shrubs such as the oleander anywhere in play

Hole #18- 401 Yards, Par 4

DESCRIPTION

Good finishing hole that requires two accurately played shots to set up a chance at one last birdie. The tee is slightly elevated offering a good view of the open landing area that invites a slightly left to right moving tee shot. Green is relatively large but is guarded by another water hazard on the left and a monster sand bunker on the right. The resident 11 foot 'gator received the moniker of M. C. Hammer during the site visit and definitely makes recovery shots left of the green a little more interesting.



Hopefully, your tee shot won't land over here....



OBSERVATIONS

- Need a low, shrubby backdrop behind green to increase playability while screening vehicles in clubhouse parking area
- Excellent finish to a satisfying round

Miscellaneous Facility Review

Although the course is primary to the enjoyment and eventual return of most of Manatee Cove' customers, the support facilities play a huge role in the overall success of the operation. This section of the GCEBA will examine the following facilities for their aesthetic, functional, and environmental values:

- Clubhouse/pro shop/snack bar
- Practice areas
- Maintenance complex
- Pesticide mixing and storage
- Cart barn
- Infrastructure



Current clubhouse is functional, yet starting to show its age.



Artist's concept drawing of new clubhouse.

Clubhouse

The clubhouse is a functional facility, yet it is proof that incremental improvements generally don't work as well as they were intended. Accordingly, Manatee Cove has completed the needs assessment segment in the process of acquiring a new facility. Construction should begin in the near future.

The new clubhouse will be sited near the existing one and will provide an aesthetically pleasing and highly functional facility. Mr. Hickey and his staff have provided ample input into the design further ensuring a long-term quality solution. Environmental impact analysis has been duly completed.



The driving range gets plenty of use at Manatee Cove.

Practice areas

Manatee Cove Golf Course is outfitted with a serviceable driving range and two practice putting greens. At least one of the practice greens will not survive the relocation of the clubhouse. Turf density and quality is always a problem at driving ranges, and Manatee Cove's gets a lot of use. With the inherent salinity problems of the course, the recoverability of the range's turf is slower than average at a southern, Bermudagrass facility.



Relatively new, attractive pesticide facility.

Pesticide mixing and storage

Appropriately sited and outfitted, the pesticide storage facility offers Manatee Cove Superintendent Mark Murphy and his staff a safe, adequate location to care for the course's pest needs. Laundry can be washed and dried at the facility as an additional amenity. One of the nearby course lakes complicates things somewhat, though there are no direct connections to the facility, pesticide mixing activities and equipment cleaning must be done with an eye toward preserving the quality of the adjacent water body. Care must be taken so that none of these activities result in pesticides entering the water.



Cart barn facilities are well located nearby the clubhouse.

Cart barn

The existing cart barn is a collection of different buildings constructed over the years near the existing clubhouse. And, like the clubhouse, is set for replacement in the near future. Electric golf carts are used exclusively for efficiency and minimal environmental impacts at Manatee Cove Golf Course.



Irrigation source features leaking piping and dilapidated walls.

Infrastructure

This section examines important elements of a quality golf course that are difficult to group into another category. Cart paths are in fair condition. The parking lot is in good condition and seems large enough to satisfy the regular demands of Manatee Cove' customers. Landscape development attempts have been relatively successful and should be continued where appropriate. There is a site amenity group near most teeing areas and the course signage could be improved. Pump house is in need of improvement.

Maintenance complex

The maintenance complex is relatively well organized, clean and functional. Ample space for equipment, parking, storage, and administrative areas are available for a professionally run operation. The irrigation pump house and the pesticide storage facility are close by for convenience and easy management.



Clean and organized equipment storage facility.



Well-lit and roomy equipment maintenance area.



Leaking pump house detracts from the overall quality of the complex.

Environmental Compatibility Quotient Checklists

The following is a brief compilation of some of the observations in each of the ten Environmental Compatibility Quotient (ECQ) categories during the site visit.

ECQ Categories

- Overall Management Philosophy & Documentation
- Safety, Training, And Awareness
- Compliance
- Course Playability
- Pollution Prevention
- Conservation Practices
- Aesthetics & Naturality
- Maintenance Practices
- Customer Relations & Education
- Miscellaneous Special Projects & Activities

ECQ Checklists

The Environmental Compatibility Quotient (ECQ) checklists are a convenient method of assessing the overall performance, implementation, and completeness of an installation's Golf Course Environmental Management Plan. The checklists can be used in many ways including:

- As an analytical tool while compiling a Golf Course Environmental Baseline Assessment like this one.
- As a self-assessment tool for the golf course manager or superintendent.
- As an award nomination evaluation by a Golf Course Assessment Team (GCAT).



Attractively appointed starter shack will be relocated after construction of the new clubhouse.



Descriptive maps assist the golfer with club selection and probably speed up play.

Key to checklist responses

- **Yes** = Practice is complete or ongoing and can be verified.
- **Partial** = Practice has been initiated but needs further attention and improvement.
- **No** = Practice is not in place.

Determining the Environmental Compatibility Quotient

The ECQ compiled for an installation's course is a snapshot of the overall performance and compliance with the GEM Plan. There are two ways to use the ECQ checklists to determine the status or quality of the environmental management program: determining the actual and potential environmental compatibility quotients.

- **Actual ECQ-** the total percentage of "Yes" responses for all ten checklists.
- **Potential ECQ-** the total percentage of "Yes" responses plus the total percentage of "Partial" responses for all ten checklists.

ECQ Scoring Scale

<u>Percent Responses Yes or Partial per Category</u>	<u>Level</u>
93-100%	Advanced
83-92%	Getting there
73-82%	Showing progress
63-72%	Early stages
Less than 62%	Just started

Overall Management Philosophy & Documentation

U.S. Air Force GEM program goals

- Enhance the installation ecologically and economically
- Demonstrate that the golf course is managed with consideration for the unique conditions of the ecosystem of which it is a part
- Document management practices to promote more widespread understanding and appreciation for environmentally sound golf course facilities
- Share information on the environmental opportunities and constraints of your golf facility with your customers, the golfers

Observations

- Stellar example of quality coordination and team work with installation environmental staff
- Need to compile and document actions already taken to create “continuity” document
- Implement planned improvements to all aspects of the golf facility management
- Utilize installation environmental management geographic information

- system and civil engineering digital aerial photographs for mapping requirements
- Need to secure computer hardware and software upgrades to increase overall efficiency and provide high speed internet access
- New clubhouse interior should be appointed with a location to present environmental information to customers



Management of the numerous water bodies is a major concern.

Overall Management Philosophy & Documentation				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Has management demonstrated that the environment is an important part of their responsibilities by initiating the GEM Planning process?	✓		
2	Has the golf course adopted and posted an Environmental Policy?	✓		
3	Is the GEM Plan underway or completed, available, and updated regularly?		✓	
4	Is a map of the property highlighting environmental opportunities or constraints such as wildlife habitat, water resources, sensitive landscapes, special management zones, etc. posted for customers?			✓
5	Environmental goals, objectives, issues, projects, and progress are evaluated at least annually and are regularly communicated to employees, customers, management, and the local community?		✓	
6	Are written records of water quality monitoring activities, results, and control measures readily available?	✓		
7	Is there an inventory of bird and mammal species documented, maintained, and readily available?	✓		
8	Is there a general understanding of how course management practices may positively enhance or adversely impact wildlife species and habitats?	✓		
9	Are the environmental impacts of pest control measures such as leaching and runoff potential, toxicity to non-target organisms, soil absorption capacity, pesticide persistence, water solubility, and effects on soil microorganisms and non-target species considered as part of the course management planning process?	✓		
10	Are records of pest treatments employed and their effectiveness maintained and used to guide future pest control decisions?	✓		
	Point totals for each column	7	2	1

Safety, Training, & Awareness

U.S. Air Force GEM program goals

- Educate all employees on the benefits of an ecosystem based golf course environmental management program
- Store and handle all potentially harmful products to minimize employee exposure
- Regularly train employees on the potential health hazards associated with their duties
- Involve entire staff in ensuring a safe golfing opportunity for their customers



Superintendent Mark Murphy attends impact analysis training.



There are never too many signs protecting customers' health.

Observations

- Expanded training for all employees a must to completely realize GEM goals
- Ensure employee's health is prime consideration
- Demonstrate genuine concern for player health and safety through actions
- Consider using AFCEE for on-site golf course environmental management training
- Lack of funding hinders training plans
- Business tempo and training scheduling makes it difficult to involve much of the staff at one time

Safety, Training, & Awareness				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	All employees are familiar with the GEM Plan and are trained regularly on the importance of environmental performance and compliance with the goals and objectives of the program?			✓
2	All appropriate employees are trained to be familiar with USAF, federal, state, and OSHA regulations that apply to storage and handling of chemicals used on the property?	✓		
3	All employees are aware that chemical manufacturing, use, storage, and disposal may pose risks to human health and the environment?	✓		
4	All employees are trained to understand that poor management practices may adversely impact worker health, on- and off-site water quality, local soil health, and wildlife species and their habitats?		✓	
5	A current copy of all Material Safety Data Sheets (MSDS) for all chemicals used anywhere on the golf course property is maintained and readily available for use by employees?	✓		
6	Chemical applicators are encouraged to apply for continuing education programs and receive regular training to maintain currency?	✓		
7	The chemical storage structure/area is locked, well-ventilated, fire proof, and access is limited to select personnel?	✓		
8	Pesticides, fertilizers, and other chemicals are stored on plastic or metal shelving?	✓		
9	Are golfers notified in the pro shop and on the first and tenth tees about the day's planned or recently completed spraying of any chemical or fertilizer that may be hazardous to human health and safety?		✓	
10	Are key staff members trained regarding water quality and conservation issues?		✓	
Point totals for each column - Response percentage		6	3	1

Compliance

U.S. Air Force GEM program goals

- Integrate management practices with appropriate regulatory requirements and procedures
- Guarantee safe, healthy, and enjoyable experience for golfers while ensuring long-term operation of the facility
- Utilize installation expertise regularly on all matters dealing with bird aircraft strike hazards, regulators, impact analysis, and cleanup



On course monitoring wells are a reminder of water quality concerns nationwide.



Liquid chemicals should never be stored above dry products of any kind.

Observations

- Assemble all documents in one place
- Do more than what is required
- Inconsistent interpretations of compliance actions among installation, MAJCOM, and ECAMP evaluators confuses and confounds
- Ensure ECAMP results are outstanding
- Relationship with installation environmental and engineering staff is exemplary

Compliance				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Is fuel storage/delivery managed in accordance with federal, state and local regulations?	✓		
2	Are installation environmental staff members included in on-going course management discussions and plans at regularly scheduled meetings?	✓		
3	Are there regularly scheduled staff meetings to discuss environmental management issues?		✓	
4	Does the director of golf and the superintendent attend ECAMP in-briefings and out-briefings?			✓
5	Does the director of golf and/or the superintendent coordinate with installation environmental staff on the various management plans that affect or include the golf course?	✓		
6	Are MSDSs readily available for all required substances?	✓		
7	Has appropriate impact analysis (NEPA) been performed on all proposed actions on or affecting the golf course property?	✓		
8	Are containers used to store used oil in good condition, not leaking, and clearly labeled?	✓		
9	Are oil/water separators operating properly and correctly maintained?	✓		
10	Are written and readily available records maintained of all applications of pesticides made by certified applicators, including the following? <ul style="list-style-type: none"> - the quantity of each pesticide used - the chemical or common name of the active pesticidal ingredient(s) (not the product name) - the pest or purpose for which the pesticide was applied --the date and place of application. 	✓		
	Point totals for each column - Response percentage	8	1	1

Course Playability

U.S. Air Force GEM program goals

- Create desirable playing conditions through the utilization of sound, ecosystem based environmental management practices
- To daily offer an enjoyable and challenging yet fair golfing experience for all levels of golfers
- Establish an open, courteous, and friendly relationship between the course manager, the superintendent, and the customer to maintain enthusiasm and interest



Turf quality could be improved in some areas of the course.



Large tees and numerous water hazards typify the challenges faced by customers at Manatee Cove Golf Course.

Observations

- Improve challenge while maintaining equitable playing conditions for all levels of golfers
- Maximize variety in course set-up by including a diversity of challenging pin placements and numerous tee locations
- Continue focusing maintenance efforts on in-appropriate play areas of the course
- Increase contour mowing for greater definition of fairway landing areas

Course Playability				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Pin placements and tee markers are regularly moved to minimize the impacts of play while increasing the enjoyment and diversity of the experience of the customer?	✓		
2	Course has sufficient number of tees to satisfy need of all types of golfers and their individual talent levels?	✓		
3	At least 75% of the greens are proportionally sized for the average length of approach shot for required all levels of golfers?	✓		
4	The speed of the greens is appropriate to their contours and size?	✓		
5	Fairway width and turf quality is sufficient for equitable challenges to all levels of golfers?	✓		
6	Roughs are regularly maintained to produce an equitable challenge to all levels of golfers?	✓		
7	Course conditioning and maintenance practices do not contribute to extending average playing times?	✓		
8	Extraneous fairway bunkers have been eliminated or converted to grass bunkers to help speed play?	✓		
9	Is bunker sand of appropriate quality and consistency?	✓		
10	Is proper drainage maintained near at least 95% of all greens and tees?	✓		
Point totals for each column - Response percentage		10	0	0

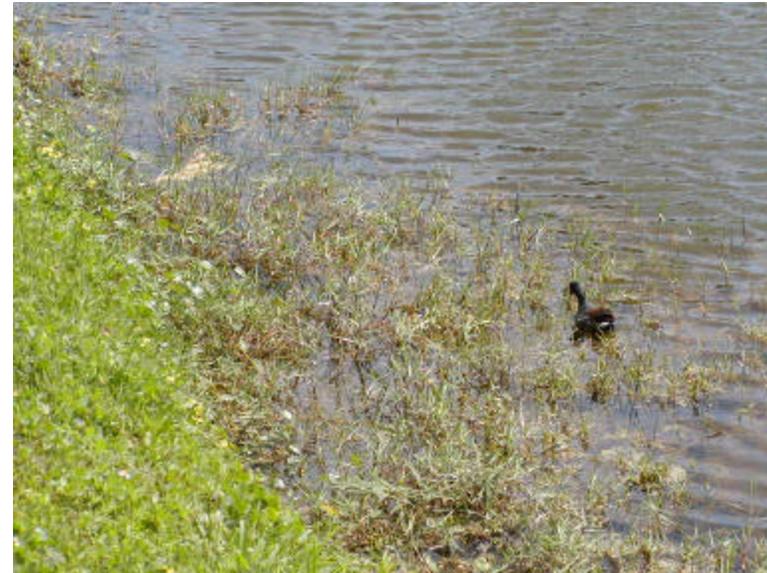
Pollution Prevention

U.S. Air Force GEM program goals

- Employ practices that eliminate or avoid the potential for polluting the environment
- Guarantee that the golf course facility will not allow chemicals, fertilizers, detergents, or petroleum products they use to migrate outside their property boundaries
- Create and utilize a comprehensive pollution prevention plan for all aspects of the golf course and its facilities



Fuel tanks are above ground and feature full containment provisions.



Ensure that vegetation growth in ponds is not due to fertilization.

Observations

- Further reduce solid waste streams from clubhouse operations
- Increase the use of slow release fertilizers
- Regularly provide training for all employees on the specifics of pollution prevention and how they can help
- Although pesticide facility is functional, consider purchasing state of the art facility and relocating nearby maintenance complex
- Completely cover fueling area rather than just the tanks

Pollution Prevention				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are there designated "no-mow" areas and established "no spray zones" and buffer areas around pond, stream, or lake edges and have they been communicated to mower operators and technicians?			✓
2	A spill containment kit is readily available and spill containment procedures are in place?	✓		
3	Does the chemical storage area have a sealed metal or concrete floor and are all pesticides handled over an impermeable surface?	✓		
4	Does the chemical storage area have a lip along the edges to contain spills?	✓		
5	Are liquid products stored below dry products and are dry materials stored on pallets or shelves to keep them off the floor?	✓		
6	Wash and wastewater is kept from making direct contact with surface water and is recycled or allowed to filter through a vegetative area when cleaning and maintaining equipment?		✓	
7	Are grass clippings blown off equipment with compressed air instead of or prior to washing?		✓	
8	Are gasoline, motor oil, brake and transmission fluid, solvents, and other chemicals used to operate or maintain equipment and vehicles prevented from directly or indirectly entering water bodies?	✓		
9	Does the fuel storage and delivery area comply with local, state, and federal regulations?	✓		
10	Are slow-release fertilizers used to reduce the negative potential for runoff?	✓		
Point totals for each column - Response percentage		7	2	1

Conservation Practices

U.S. Air Force GEM program goals

- Use natural resources efficiently while respecting their long term value to the local community and the mission of the USAF
- Provide important greenspace benefits
- Closely monitor and manage water use to prevent unnecessary depletion of installation or local water resources



Manatees regularly visit the small cove behind the first tee.



Preservation of native raptors are an important aspect of Patrick AFB's natural resource management goals.

Observations

- Incorporate contour mowing procedures
- Increase communication with customer on conservation practices that are already in place
- Continue building relationships with installation natural resources manager and other environmental professionals through the manager, Jim Hickey's innovative GMC (Golf Course Environmental Management Committee) idea
- Provide detailed input to the scheduled update of installation integrated natural resources management plan (INRMP)

Conservation Practices				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are all motorized golf course equipment checked regularly for excessive air polluting emissions?			✓
2	Has the irrigation system been completely checked for proper water distribution in all irrigated areas and are water leaks fixed in a timely manner?	✓		
3	Has the irrigation system or its components recently been upgraded to reduce inefficiency, malfunction, and overall water use?		✓	
4	Has all "non-target" irrigation (ponds, out of play areas, etc.) been eliminated or minimized?		✓	
5	Have flow meters been installed to monitor water use and detect potential waste?	✓		
6	Have part circle irrigation heads been installed where possible to save water resources?	✓		
7	Are employees encouraged to minimize their trips around the course to conserve on the use of fossil fuels?			✓
8	Does the snack bar utilize reusable plates and silverware for use by customers throughout the facility's operating hours?		✓	
9	Have all potential wildlife habitats and their maintenance practices been coordinated with the installation BASH officer and environmental management personnel?	✓		
10	Are recycling containers conveniently provided for customer and employee use throughout the golf course facility?	✓		
Point totals for each column - Response percentage		5	3	2

Aesthetics & Naturality

U.S. Air Force GEM program goals

- Create and maintain an attractive golf course facility that requires minimal outside chemical or fertilizer inputs
- Utilize native or indigenous plant materials exclusively
- Consider every aspect of the golf course facility as a positive contributor to the overall satisfaction of the customer



Hibiscuses are the stars of the local landscape.



Invasive exotics dominate the tree species at Manatee Cove.

Observations

- Enlist environmental staff to determine how the golf course staff can assist in the removal of invasive exotics that dominate the landscape
- Increase number and variety of new native trees added to course every year
- Funds needed to expand landscape improvements to selected areas on the course should be programmed for the near future

Aesthetics & Naturality				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Is the area near the clubhouse attractively landscaped and maintained?	✓		
2	Is there an appropriately located and attractive facility sign and has the on course signage been designed and maintained attractively?	✓		
3	Does the course seem to be part of the natural landscape and overall contours?	✓		
4	Are pest-resistant and drought-tolerant native trees, shrubs, groundcovers, or their cultivars used in landscaped areas?	✓		
5	Are there "targeted", highly visible areas where flowering annuals or perennials are appropriately maintained?	✓		
6	Are the relative numbers of the prominent deciduous, evergreen, and flowering golf course trees balanced and at least 75% native species?			✓
7	Are the maintenance facility and the course's miscellaneous "outbuildings" maintained sufficiently and/or screened from view?	✓		
8	Is there an attractive and well-maintained site amenity group (bench, washer, etc.) at least 75% of the tees?	✓		
9	Do the driving range, practice areas, and parking areas present a positive image?	✓		
10	Is the cart barn integrated into the overall landscape plan of the course or the area in which it is located?	✓		
Point totals for each column - Response percentage		9	0	1

Maintenance Practices

U.S. Air Force GEM program goals

- Integrate the concept of ecosystem management into all course management decisions and practices
- Employ the principles of integrated pest management
- Document all activities for future reference
- Constantly examine management practices to look for improvements
- Insist on a well-trained staff



The popular course receives a lot of wear and tear.



Adequate and environmentally sound water hazard maintenance is difficult to impossible for the existing staff and budget.

Observations

- Increased training and involvement of staff on integrated pest management procedures
- Compile written pest profiles of common pest species
- Improve water hazard care to eliminate unwanted vegetation while improving aesthetics and habitat
- Increase number of trained scouts on the maintenance staff

Maintenance Practices				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Is contour mowing used to conserve fuel and increase playability and aesthetics?	✓		
2	Are there designated non-maintained or minimally maintained buffers around core wildlife habitats?			✓
3	Are green, tee, and fairway mowing heights maintained at reasonable levels without continually stressing turf or maximizing chemical inputs?	✓		
4	Are there regular procedures in place to continually improve soil health such as organic amendments, aeration, and drainage?	✓		
5	Is there a map of the course's "hot spots" requiring special care or regular attention?			✓
6	Are there trained scouts on staff other than the superintendent to monitor turf and plant health and pest populations using scouting forms to record the type, severity, location, and treatment of pest problems and organized into a report or guide so that they can be used for future pest control solutions?			✓
7	Are there written pest profiles of common pest species with a variety of potential control measures pre-evaluated including alterations in cultural management, biological, physical, and mechanical controls prior to treating the problem on the course?		✓	
8	Are there established and documented aesthetic and functional thresholds for insects, fungal diseases, and weeds for all managed areas to precisely and effectively manage pest populations and reduce chemical inputs?			✓
9	Have all playing surfaces been inventoried and mapped for soil types including soil structure, nutrient levels, organic content, compaction, and water infiltration?		✓	
10	Are soil tests and plant tissue analysis used to determine nutritional requirements?	✓		
Point totals for each column - Response percentage		4	2	4

Customer Relations & Education

U.S. Air Force GEM program goals

- Ensure that the customer knows that their opinions count and will be acknowledged, assessed, and acted upon
- Educate the customers about the benefits of environmentally responsible golf course management and the future of the game and the environment
- Enlist customer support and assistance on caring for the course and its facilities as well as GEM Plan goals



A happy staff equals happy customers.

Observations

- Efforts to solicit customer opinions and concerns are a great example for all U. S. Air Force golf facilities
- Create a location to communicate environmental management goals and maintenance plan in the new clubhouse
- Continue to involve installation youth through rules and instruction clinics



Typical Manatee Cove clientele enjoying their round.

Customer Relations & Education				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are the course manager and superintendent involved in a long-term customer educational program that is regularly updated and documented?	✓		
2	Is there a conveniently located and highly visible place at the course or clubhouse where golf course environmental management notices and informational messages are regularly posted?	✓		
3	Do the course manager and superintendent actively communicate with customers to determine and document their points of view?	✓		
4	Is there active and regular communication with the Golf Council, Civil Engineering, Environmental Management, the Services manager, and commanders by course management?	✓		
5	Are there warning signs posted near parking lots to make highly sensitive individuals aware of the potential danger to their health and are all state posting requirements being met?			✓
6	Is there consistent and attractive signage around the course and grounds that would increase the awareness of the average golfer to the environmental management practices employed?			✓
7	Are there signs appropriately located to warn golfers of hazards when drinking reclaimed or otherwise non-potable water?	✓		
8	Are there interpretive signs posted to highlight key habitats or have appropriate areas been designated "Environmentally Sensitive Zones" per USGA rules?			✓
9	Are course staff members trained regularly on how to improve their dealings with customers?	✓		
10	Are there clinics provided to teach beginning golfers the basics of the game and to teach all levels of golfers the rules of the game?	✓		
	Point totals for each column	7	0	3

Miscellaneous Special Projects & Activities

U.S. Air Force GEM program goals

- Educate the local community about the benefits of an environmentally responsible golf course management approach is for the future of the game and the environment
- Reach out to school children to raise their awareness and appreciation for the game of golf and the GEM Plan principles
- Further the great game of golf at all times in as many ways as possible



Staff desires to dredge lakes for better capacity and vegetation control.



Numerous varieties of birds populate the golf course.

Observations

- Conduct field trips at the course for local school children
- Enlist the assistance of local city and county officials on golf course environmental planning initiatives
- Initiate Earth Day environmental awareness golf tournament
- Educate customers about the benefits of an environmentally friendly golf course
- Need to demonstrate dedication to “growing” the great game of golf to young airmen, other installation non-golfers, and youth

Miscellaneous Special Projects & Activities				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are there projects planned and funded for the next year that would communicate the compatibility of the course's management methods with protection of the environment?		✓	
2	Are there projects planned and funded to reduce the course's potential negative environmental impacts?			✓
3	Are there fundraising tournaments planned that may provide for future environmentally-related projects?			✓
4	Are there regular field trips for local students or other local community groups hosted at the course?			✓
5	Are there projects planned to eliminate or minimize a potential erosion problem?	✓		
6	Does the course have a native tree installation program complete with planting plan and maintenance schedule?			✓
7	Are any of the local schools or universities involved in educational or research activities at your course?			✓
8	Are there special facility-wide recycling programs underway?	✓		
9	Is your course an active participant in the USAF Golf Environmental Management Program?	✓		
10	Has your facility been nominated by your MAJCOM for the golf course environmental management award in the last 3 years?			✓
	Point totals for each column	3	1	6

ECQ Summary

#	Environmental Compatibility Quotient Category	Yes	Partial	No
1	Overall Management Philosophy & Documentation	7	2	1
2	Safety, Training, & Awareness	6	3	1
3	Compliance	8	1	1
4	Course Playability	10	0	0
5	Pollution Prevention	7	2	1
6	Conservation Practices	5	3	2
7	Aesthetics & Naturality	9	0	1
8	Maintenance Practices	4	2	4
9	Customer Relations and Education	7	0	3
10	Miscellaneous Special Projects & Activities	3	1	6
	Composite points & response percentage	66	14	20

GCEBA Results

- * **Manatee Cove Golf Course, Patrick AFB, FL**
 - **Actual ECQ (# of “Yes”) = 66 “Early Stages”**
 - **Potential ECQ (Actual ECQ plus “Partial”) = 80 “Showing Progress”**

Conclusion

Manatee Cove Golf Course is highly successful largely due to the positive, customer-oriented and personable approach of manager, Jim Hickey. The course's location on a little slip of sand between the Atlantic Ocean and the Banana River in combination with the high number of annual rounds played makes for a tough task in caring for the course's 226 acres of in-play turf areas. A high percentage of Manatee Cove's trees are undesirable invasive exotics in line for introduction to the natural resource manager's chain saw. Salt intrusion from relatively poor quality irrigation water and wind deposition directly on the turf and soil further complicates the task. In the best situation, the course would explore wholesale change of the turf to seashore paspalum that thrives in these conditions. Of course, funding is always hard to come by and this radical a change would cost plenty.

Environmentally, the Manatee Cove staff has taken an aggressive stance. Nowhere else has such a proactive attitude been observed. Mr. Hickey announced mid-week in the visit that he would form the first GEMC, or golf course environmental management committee, composed of environmental, civil engineering, and BASH staffers to meet monthly at the course for lunch and then out on the course to see the issues up close and personal. These are the types of ideas that need to be part of every U. S. Air Force golf course staff's agenda. Implementation is the next challenge, hopefully met head on with the same attitude.

Areas needing improvement

The ECQ Summary on the previous page highlights the following areas for relative improvement at Patrick AFB:

- Conservation Practices
- Maintenance Practices
- Miscellaneous Special Projects & Activities

The gallery

This section of the report will be where some of the more revealing photographs (of the literally hundreds taken during the site visit) of pests, maintenance practices, and other areas where improvements may be made to create the best possible golf facility.



Native cabbage palms thrive at Manatee Cove.



Damage by the sand rake machine detracts from the experience.



Shade is a popular commodity.



Birdhouses support the exemplary natural resources program.



Turf wear and erosion starts right where curb ends.

Environmental challenges

One of the important results of the GCEBA process is the identification of significant issues or challenges that should be addressed in the long term GEM Planning process. Ideally, the golf staff will address each issue from the best way to satisfy the goals of the golf facility and acceptable levels of course playability and customer satisfaction. The golf staff's preferred management approach for these issues should then be coordinated with the installation's environmental staff for refinement, coordination, and approval.

The GEM Plan would then consist of the environmental challenges, the approach to their management, a map showing where these challenges occur on the golf course, a booklet that describes the mapped challenges, goals and objectives for future years, and a set of best management practices.

The following environmental challenges were identified during the GCEBA process at Manatee Cove Golf Course, Patrick AFB, FL:

- Invasive exotics
- Audubon Cooperative Sanctuary Program
- Housing privatization
- Bird/Wildlife Aircraft Strike Hazard (BASH)
- Threatened & endangered species
- Water quality management

INVASIVE EXOTICS

The entire state of Florida has undertaken the mammoth task of eliminating plant materials foreign to the United States. Of special concern are the so-called invasive exotics, that is, non-native plants that aggressively reproduce with little to no natural controls. These plants can clog waterways, replace less hardy natives, and generally take over the landscape. The Manatee Cove Golf Course grounds are home to at least three of these types of species: melaleuca, Torpedo grass, and Brazilian pepper. With a little instruction, the golf staff can assist the installation in their elimination.



Few, if any, of the trees visible in this photo are not invasive exotics.

AUDUBON COOPERATIVE SANCTUARY PROGRAM

Manatee Cove Golf Course, with assistance from the installation environmental staff, is proactively pursuing fully certified status in the Audubon Cooperative Sanctuary Program as created and managed by Audubon International, the former state of New York Audubon chapter. The program is internationally recognized for its contribution to the increased environmental stewardship of golf courses. Unfortunately, U. S. Air Force golf courses should almost never be managed to increase wildlife habitats, one of the Audubon's expressed goals. The mission of the golf course is to provide recreational opportunities on quality turf while supporting the overall mission of the U. S. Air Force. Great care should be exercised on the types of improvements and management practices that are adopted under the guise of pursuing certification.

HOUSING PRIVATIZATION

As part of a nationwide Department of Defense initiative, the military's housing areas are being added to, renovated, or rebuilt. A requirement for senior officer quarters on Patrick AFB will necessitate the use of a parcel of land adjoining the golf course. After several siting and design attempts, the only "acceptable" location of the proposed newly constructed units will require the redesign of three of Manatee Cove's holes. An experienced, professional golf course architect will be employed in the redesign efforts. AFCEE will be available to assist any way possible to ensure a quality rebuild of the course.

BIRD/WILDLIFE AIRCRAFT STRIKE HAZARD (BASH)

Situated between two major bodies of water Patrick AFB and the golf course are in an area of significant bird activity and species diversity. The Bird Hazard Reduction Plan lists gull, egret, little and great blue heron, pelican, coot, willet, yellow legs, killdeer, plover, black skimmer, osprey, and kestrel hawk as potential concerns to aircraft safety. The golf course staff must coordinate any and all activities that affect this issue directly with the base flying safety office BASH experts. U. S. Air Force golf courses must never be connected in any way to BASH related aircraft or flying crew damage or losses.

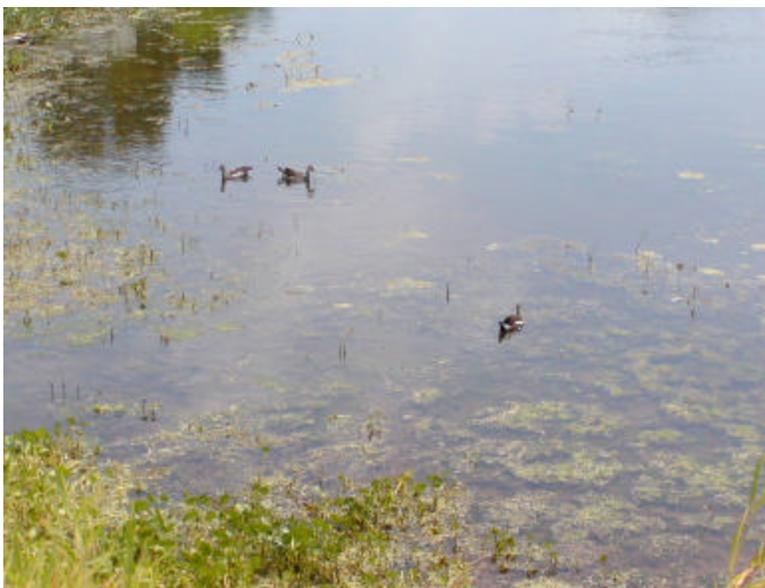


Gulls lead the list of species of concern to aircraft flying safety.

THREATENED & ENDANGERED SPECIES

An excerpt from the Integrated Natural Resources Management Program lists 19 threatened, endangered, or special concern species observed on Patrick AFB. The list includes stellar species such as the course's namesake, the Florida Manatee. Only the American alligator and the Southeastern American kestrel occur specifically on the golf course grounds.

A large number of water birds have been observed using golf course ponds, vegetated areas surrounding the airfield, as well as areas along the Banana River shoreline. In addition to the BASH problem, a major concern for birds in these areas is the water quality.



Water bodies connect several challenges such as BASH, water quality, and threatened and endangered species.

WATER QUALITY MANAGEMENT

The protection of the many, interconnected water bodies are probably the main environmental concern for Patrick AFB managers.

Turf buffers, no mow, and no spray zones should be created around all Manatee Cove water bodies and all pertinent golf course staff should be trained concerning water quality issues. Slow release fertilizers should be used whenever possible. No pesticides should be applied when potentially severe rainfalls are predicted or expected.

The golf course water bodies have the potential to receive inputs of pesticides, herbicides and fertilizer from course maintenance activities. A pond enhancement project has been proposed that would be "initiated to provide both a better habitat for fish located with the pond and a new habitat to the birds and other animals located around the pond". Once again, extreme care should be taken to ensure that projects are undertaken to accomplish appropriate goals for the right reasons that support the mission of safely flying airplanes.

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Draft Bird Hazard Reduction Plan, 45th Space Wing, Patrick Air Force Base, Florida, undated





For additional assistance or more information, please contact:

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<http://www.afcee.brooks.af.mil/ec/golf/>