



Guana Tolomato Matanzas National Estuarine Research Reserve

Management Plan • May 2009 - April 2014



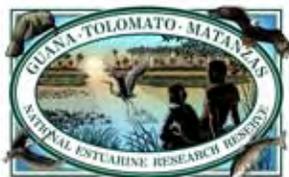
Florida Department of Environmental Protection
Coastal and Aquatic Managed Areas
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www.FloridaCoasts.org



This management plan has been developed in accordance with National Oceanic and Atmospheric Administration regulations, including all provisions for public involvement. It is consistent with the congressional intent of Section 315 of the Coastal Zone Management Act of 1972, as amended, and the provisions of the Florida Coastal Management Program.

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May 2009



Guana Tolomato Matanzas National Estuarine Research Reserve

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Management Plan • May 2009 - April 2014

Includes:

- *Guana-Tolomato-Matanzas National Estuarine Research Reserve*
- *Guana River Marsh Aquatic Preserve*
- *Pellicer Creek Aquatic Preserve*



**Florida Department of Environmental Protection
Coastal and Aquatic Managed Areas**

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Mission Statements

Office of Coastal and Aquatic Managed Areas / The mission of the Office of Coastal and Aquatic Managed Areas in relation to Florida's 41 aquatic preserves, three National Estuarine Research Reserves, National Marine Sanctuary, and Coral Reef Conservation Program is to protect Florida's coastal and aquatic resources.

National Estuarine Research Reserves (NERR) / The NERR System mission is the establishment and management, through Federal-state cooperation, of a national system of Estuarine Research Reserves representative of the various regions and estuarine types in the United States. Estuarine Research Reserves are established to provide opportunities for long-term research, education, and interpretation.

Guana Tolomato Matanzas National Estuarine Research Reserve / The GTM Research Reserve mission is to achieve the conservation of natural biodiversity and cultural resources by using the results of research and monitoring to guide science-based stewardship and education strategies.

CAMA/BTIITF Approval

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ARC approval date: April 3, 2009

Comments:

NOAA approval date:

BTIITF approval date: May 13, 2009

Executive Summary

In 1999, the Guana Tolomato Matanzas National Estuarine Research Reserve (GTM Research Reserve) was designated in St. Johns and Flagler counties, Florida as a part of the National Oceanic and Atmospheric Administration (NOAA) National Estuarine Research Reserve (NERR) system because of its outstanding representation of the east Florida sub-region of the Carolinian bioregion and its unique combination of natural and cultural resources. The hallmark of the NERR program is that each reserve's management efforts are in direct response to, and designed for unique local and regional issues. The purpose of this plan is to incorporate, evaluate, and prioritize all relevant information about the GTM Research Reserve into management strategies, allowing for compatible public access to the managed areas while sustaining the long-term quality of its ecosystems and cultural resources.

This management plan is an update to the previous five-year GTM Research Reserve plan approved on November 10, 1998. In addition to the existing NERR plan, both aquatic preserves managed by the GTM Research Reserve previously had individual management plans. The Guana River Marsh Aquatic Preserve (GRMAP) management plan was approved December 17, 1991 and the Pellicer Creek Aquatic Preserve (PCAP) management plan was approved July 9, 1991. Uplands along the Guana River that are currently managed as part of the GTM Research Reserve were previously managed as the Guana River State Park (management plan approved March 26, 1999). The inclusive management of these sites as the GTM Research Reserve represents a significant enhancement of the purpose of the property as a platform for research and education.

The diversity of communities present in the 64,487 acre GTM Research Reserve provides habitat for a wide variety of fish and wildlife. A species list recently compiled for the GRMAP indicates the presence of at least 44 mammal, 358 bird, 41 reptile, 21 amphibian, 303 fish, and 580 plant species. Many more species are expected to occur in the entire GTM Research Reserve. These habitats are essential to many protected species (eight plants and forty-eight animals) including the Anastasia Island beach mouse (*Peromyscus polionotus phasma*), gopher tortoise (*Gopherus polyphemus*), least tern (*Sterna antillarum*), marine turtles: loggerhead (*Caretta caretta*), leatherback (*Dermodochelys coriacea*) and green turtle (*Chelonia mydas*), and North Atlantic right whale (*Eubalaena glacialis*). In addition, the striped newt (*Notopthalmus perstriatus*), one of Florida's rarest vertebrate species, occurs within the GTM Research Reserve. Some of the many rare listed birds of the GTM Research Reserve include: great egret (*Ardea alba*), white ibis (*Eudocimus albus*), black-crowned night heron (*Nycticorax nycticorax*), least tern (*Sterna antillarum*), bald eagle (*Haliaeetus leucocephalus*), tricolored heron (*Egretta tricolor*), wood stork (*Mycteria americana*) and roseate spoonbill (*Ajaia ajaja*). The rare Atlantic geoduck (*Panopea bitruncata*) has also been recorded in the GTM Research Reserve. With this plan the GTM Research Reserve will continue to expand its role to facilitate and conduct research and monitoring, stewardship and education strategies designed to enhance our ability to monitor the condition of these species and to conserve their habitats.

Many species of commercial value are also known to use the GTM Research Reserve's estuaries for all or part of their life cycle. These species include oysters (*Crassostrea virginica*), quahog clams (*Mercenaria spp.*), blue crabs (*Callinectes sapidus*), stone crabs (*Menippe mercenaria*), white shrimp (*Penaeus setiferus*), brown shrimp (*Penaeus aztecus*), striped and white mullet (*Mugil cephalus* and *M. curema*), gag grouper (*Myctoperca microlepis*), black sea bass (*Centropristis striata*), gray snapper (*Lutjanus griseus*), lane snapper (*L. synagris*), flounder (*Paralichthys lethostigma* and *P. dentatus*), bluefish (*Pomatomus saltatrix*), menhaden (*Brevoortia tyrannus*) and thread herring (*Opisthonema oglinum*). Management strategies to conserve and restore natural habitats supporting sustainable populations of these species are an important management priority for the GTM Research Reserve.

Recreationally valuable species provide a valuable economic incentive for long-term conservation of the GTM Research Reserve's natural resources. Species important to the local sports fishery that are found in the GTM Research Reserve include tarpon (*Tarpon atlanticus*), spotted sea trout (*Cynoscion nebulosus*), weakfish (*C. regalis*), snook (*Centropomus undecimalis*), red drum (*Sciaenops ocellata*), black drum (*Pogonias cromis*), spot (*Leiostomous xanthurus*), croaker (*Micropogon undulatus*), sheepshead (*Archosargus probatocephalus*), crevalle jack (*Carynx hippos*), gag grouper (*Myctoperca microlepis*), black sea bass (*Centropristis striata*), gray snapper (*Lutjanus griseus*), lane snapper (*L. synagris*), Florida pompano (*Trachinotus carolinus*), flounder (*Paralichthys sp.*), striped mullet (*Mugil cephalus*), and sailor's choice (*Haemulon parri*). Habitat and species management based on the best available scientific information is required to sustain this valuable resource.

In addition to these natural resources the GTM Research Reserve contains a unique array of cultural resources. This ecosystem has been used by humans for over 5,000 years. Artifacts found in the GTM

Research Reserve area range from an arrowhead from the late Archaic (2500-1000 BC) to pottery from the 19th century. There are currently 115 recorded archaeological sites within its boundary. Known sites include a burial mound, numerous shell middens, a Spanish mission, and homestead sites from the British, Second Spanish and Territorial time periods. Culture resource interpretation and protection is given special consideration in this plan.

The GTM Research Reserve also contains extensive public use amenities directly managed by the reserve staff including an extensive trail system, beaches with parking access and dune boardwalks, the Guana Lake Dam, and an Environmental Education Center that welcomes approximately 20,000 visitors per year including 2,500 students and teachers. Public use of the beaches and trail system is estimated to accommodate an additional 170,000 visitors per year. Based on local community support and public input, this management plan's public use strategies emphasize high quality and sustainable natural resource experiences.

Included in the boundary of the GTM Research Reserve are numerous conservation areas including the Guana River Wildlife Management Area, Deep Creek State Forest, Stokes Landing Conservation Area, Fort Matanzas National Monument, Washington Oaks Gardens State Park, Faver-Dykes State Park, Moses Creek Conservation, Pellicer Creek Conservation Area, Princess Place Preserve, and the River to Sea Preserve. Following the designation of the GTM Research Reserve a twenty-one member Management Advisory Group (MAG) was established. Representation consists of citizens, local government officials, managers of the public lands included in the boundary, private property owners, scientists and environmental educators. This advisory group provides a unique opportunity to enhance cooperative management for the conservation of this ecosystem.

This revised management plan also identifies additional facilities, staffing, and boundary expansions compatible and needed for the GTM Research Reserve to continue its mission. The proposed boundary expansion includes approximately sixty-one acres of fee-simple acquisition and annexation of eight-thousand-eight-hundred-sixty-five acres of public lands within or immediately adjacent to the GTM Research Reserve's existing boundary. There are no plans to change the management authority of the annexed properties. The proposed expanded boundary will enhance the GTM Research Reserve's partnerships with key stakeholders and provide additional opportunities to restore or maintain cultural resources, natural biodiversity, and important watershed water-quality buffers and flow-ways.

The management challenges affecting the GTM Research Reserve can be categorized within the following topics: Public Use, Habitat and Species Management, Watershed Landuse, Cultural Resource Preservation and Interpretation, and Global Processes. Incompatible public use and lack of a scientifically defined carrying capacity, habitat fragmentation and loss, point and non-point source pollution, protection and interpretation of cultural resources and assessing the impact of global processes are management priorities. These issues can be indirectly or directly linked to anthropogenic landuse of increasing population densities accompanied by increasing development, recreation, and economic pressures. These potential impacts to resources can affect the productivity and function of coastal ecosystems, requiring active management to restore and sustain the condition of these resources.

GTM Research Reserve Management Goals

Public Use

Ensure user experiences are sustainable and consistent with natural and cultural resource protection for the benefit of existing and future generations.

Habitat and Species Management

Improve the conservation of natural biodiversity by implementing the principles of adaptive management and ecosystem science.

Watershed Landuse

Reduce the impact of watershed landuse on coastal resources by identifying priority pollutants and encouraging best management practices.

Cultural Resource Preservation and Interpretation

Enhance understanding, interpretation, and preservation of the GTM Research Reserve's cultural resources.

Global Processes

Serve as a clearinghouse of information concerning global and meteorological processes and as a demonstration site for green building technologies and practices.

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Natural coquina rock formations like these found at the beach and nearshore environment at Marineland provide unique and valuable habitat and buffer shorelines from erosion by storms.

Part One

Basis for Management

Chapter One

1.1 / Introduction

The National Estuarine Research Reserve (NERR) System is a network of protected areas established for long-term research, education, and stewardship. Section 315 of the Coastal Zone Management Act (CZMA) of 1972, as amended, established the National Estuarine Research Reserve System to be administered by the National Oceanic and Atmospheric Administration (NOAA) in cooperation with the coastal states in which the NERRs are designated. Under the system, healthy estuarine ecosystems which typify different regions of the U.S. are designated and managed as sites for long-term research and are used as a base for estuarine education and interpretation programs. The system also provides a framework through which research results and techniques for estuarine education and interpretation can be shared throughout the region and across the nation.

This partnership program between NOAA and the coastal states protects more than one million acres of estuarine land and water, which provide essential habitat for wildlife; offer educational opportunities for students, teachers and the public; and serve as living laboratories for scientists. The Guana Tolomato Matanzas National Estuarine Research Reserve (GTM Research Reserve, Figure 1) was designated in St. Johns and Flagler counties, Florida as a part of this system because of its outstanding representation of the east Florida sub-region of the Carolinian bioregion and its unique combination of natural and cultural resources. The site selection process for this the GTM Research Reserve began in September of 1991. The present day GTM Research Reserve was selected by a committee of scientists, environmental educators and coastal managers because it met the overall needs of a relatively pristine habitat for scientific research and environmental education opportunities. The selection was supported by citizens and legislators of St. Johns and Flagler counties. The Governor and Cabinet of the State of Florida then nominated the estuaries comprising



Figure 1 | Boundary and location of the GTM Research Reserve indicating the area directly managed by CAMA.

the Guana, Tolomato and Matanzas including the Pellicer Creek Aquatic Preserve (PCAP) and Guana River Marsh Aquatic Preserve (GRMAP) as the now existing GTM Research Reserve. The final GTM Research Reserve designation was made in August, 1999. In January 2004, management authority of Guana River State Park was conveyed to the DEP, Office of Coastal and Aquatic Managed Areas (CAMA). Within the GTM Research Reserve, CAMA directly manages the PCAP, portions of the GRMAP including the lands that formerly made up the Guana River State Park, and other state sovereign submerged lands within the Matanzas River and its tributaries inside the GTM Research Reserve designated boundary that were classified as Class II or Outstanding Florida Waters as of 1998 (Florida Department of Environmental Protection, 1998). This area includes tidally submerged state sovereign adjacent to and within the Intracoastal Waterway and its tributaries, excluding the Treasure Beach Canal System - From Intracoastal Waterway marker number 29, south to an east-west line through marker number 109).

The Florida NERRs are administered on behalf of the State by the DEP Office of CAMA as part of a network (Figure 2) that includes forty-one aquatic preserves, three NERRs, a National Marine Sanctuary (NMS), the Coral Reef Conservation Program (CRCP), and the Florida Oceans and Coastal Council. This provides for a system of significant protections to ensure that our most popular and ecologically important underwater ecosystems are cared for in perpetuity. Each of these special places is managed with strategies based on local resources, issues, and conditions.

Our expansive coastline and wealth of aquatic resources have defined Florida as a subtropical oasis, attracting millions of residents and visitors, and the businesses that serve them. Florida's submerged lands play important roles in maintaining good water quality, hosting a diversity of wildlife and habitats (including economically and ecologically valuable nursery areas), and supporting a treasured quality of life for all. In the 1960s, it became apparent that the ecosystems that had attracted so many people to Florida could not support rapid growth without science-based resource protection and management. To this end, state legislators provided extra protection for certain exceptional aquatic areas by designating them as aquatic preserves.

Title to submerged lands not previously conveyed to private landowners is held by the Board of Trustees of the Internal Improvement Trust Fund



Figure 2 | CAMA state-wide managed resources.

(the Trustees). The Governor and Cabinet, sitting as the Trustees, act as guardians for the people of the State of Florida (§253.03, Florida Statutes [F.S.]) and regulate the use of these public lands. Through statute, the Trustees have the authority to adopt rules related to the management of sovereignty (Florida Aquatic Preserve Act of 1975). A higher layer of protection is afforded to aquatic preserves which include areas of sovereignty lands that have been “set aside forever as aquatic preserves or sanctuaries for the benefit of future generations” due to “exceptional biological, aesthetic, and scientific value” (Florida Aquatic Preserve Act of 1975, §258.36, F.S.).



Recreation is an important ecological service provided by GTM Research Reserve.

1.2 / Management Plan Purpose and Scope

The NOAA requirements for the preparation of management plans are outlined in the National Estuarine Research Reserve Program Regulations (CZMA section 315, and 15 Code of Federal Regulations (CFR) Part 921). The federal regulations ensure that NERR management programs are consistent with the goals, objectives, and policies of the NERR System. The mandate for developing aquatic preserve management plans is outlined in Rule 18-20.013 and Subsection 18-18.013(2) of the Florida Administrative Code (F.A.C.).

Management plan development and review begins with collecting resource information from historical data, research and monitoring and includes input from individual CAMA managers and staff, area stakeholders, and members of the general public. The statistical data, public comment, and cooperating agency information, is then used to identify management issues and threats affecting the present and future integrity of the site, its boundaries, and adjacent areas. This information is utilized in the development and review of the management plan, which is examined for consistency with the statutory authority and intent of the aquatic preserve and NERR programs. Each management plan is evaluated periodically and revised as necessary to allow for strategic improvements. Intended to be used by site managers and other agencies or private groups involved with maintaining the natural integrity of these resources, the plan includes scientific information about the existing conditions of the site and the management strategies developed to respond to those conditions.

This management plan is an update to the previous five-year GTM Research Reserve plan approved on November 10, 1998. In addition to the existing NERR plan, both aquatic preserves managed by the GTM Research Reserve previously had individual management plans. The GRMAP management plan was approved December 17, 1991 and the PCAP management plan was approved July 9, 1991. Uplands along the Guana River that are currently managed as part of the GTM Research Reserve were previously managed as the Guana River State Park (management plan approved March 26, 1999). The management of these sites as the GTM Research Reserve represents a significant enhancement of the purpose of the property as a platform for research and education.

1.3 / **Public Involvement**

CAMA recognizes the importance of stakeholder participation and encourages their involvement in the management plan development process. CAMA is also committed to meeting the requirements of the Sunshine Law, §286.011, F.S. and federal regulations 15 CFR 921.33:

- Meetings of public boards or commissions must be open to the public;
- Reasonable notice of such meetings must be given; and
- Minutes of the meetings must be recorded.
- NOAA may require public notice, including notice in the Federal Register and an opportunity for public comment before approving a boundary or management plan change.

Several key steps have been taken during the development of this management plan. First, staff organized an advisory committee comprised of key stakeholders. Next, staff advertised and conducted public meetings to receive input from stakeholders on the concerns and perceived issues affecting the GTM Research Reserve. This input was utilized in the development of a draft management plan that was reviewed by CAMA staff, the advisory committee, and NOAA. After the initial reviews, the staff advertised and conducted, in conjunction with the advisory committee, a second public meeting to engage the stakeholders for feedback on the draft plan and the development of the final draft of the management plan. For additional information about the advisory committee and the public meetings refer to Appendix D / Public Involvement. All public meeting notices were posted on the property, electronically mailed to a large recipient list, placed on the DEP Associated Press wire, announced at a scheduled governmental meeting and advertised in the Florida Administrative Weekly.



Marshes provide nutrients, filter pollutants and serve as habitats to conserve natural biodiversity that is necessary to sustain recreational and commercially important species.

Chapter Two

National Estuarine Research Reserve System

2.1 / Introduction

The National Estuarine Research Reserve (NERR) System was created by the Coastal Zone Management Act (CZMA) of 1972, as amended, 16 U.S.C. Section 1461, to augment the Federal Coastal Zone Management (CZM) Program. The CZM Program is dedicated to comprehensive, sustainable management of the nation's coasts.

The Reserve system is a network of protected areas established to promote informed management of the Nation's estuaries and coastal habitats. The Reserve system currently consists of 27 reserves in 22 states and territories, protecting over one million acres of estuarine lands and waters.

2.2 / NERR System Mission and Goals

NERR Mission - As stated in the NERR regulations, 15 Code of Federal Regulations (CFR) Part 921.1(a), the NERR System mission is:

“the establishment and management, through Federal-state cooperation, of a national system of Estuarine Research Reserves representative of the various regions and estuarine types in the United States. Estuarine Research Reserves are established to provide opportunities for long-term research, education, and interpretation.”

NERR System Goals - Federal regulations, 15 CFR Part 921.1(b), provide five specific goals for the NERR System:

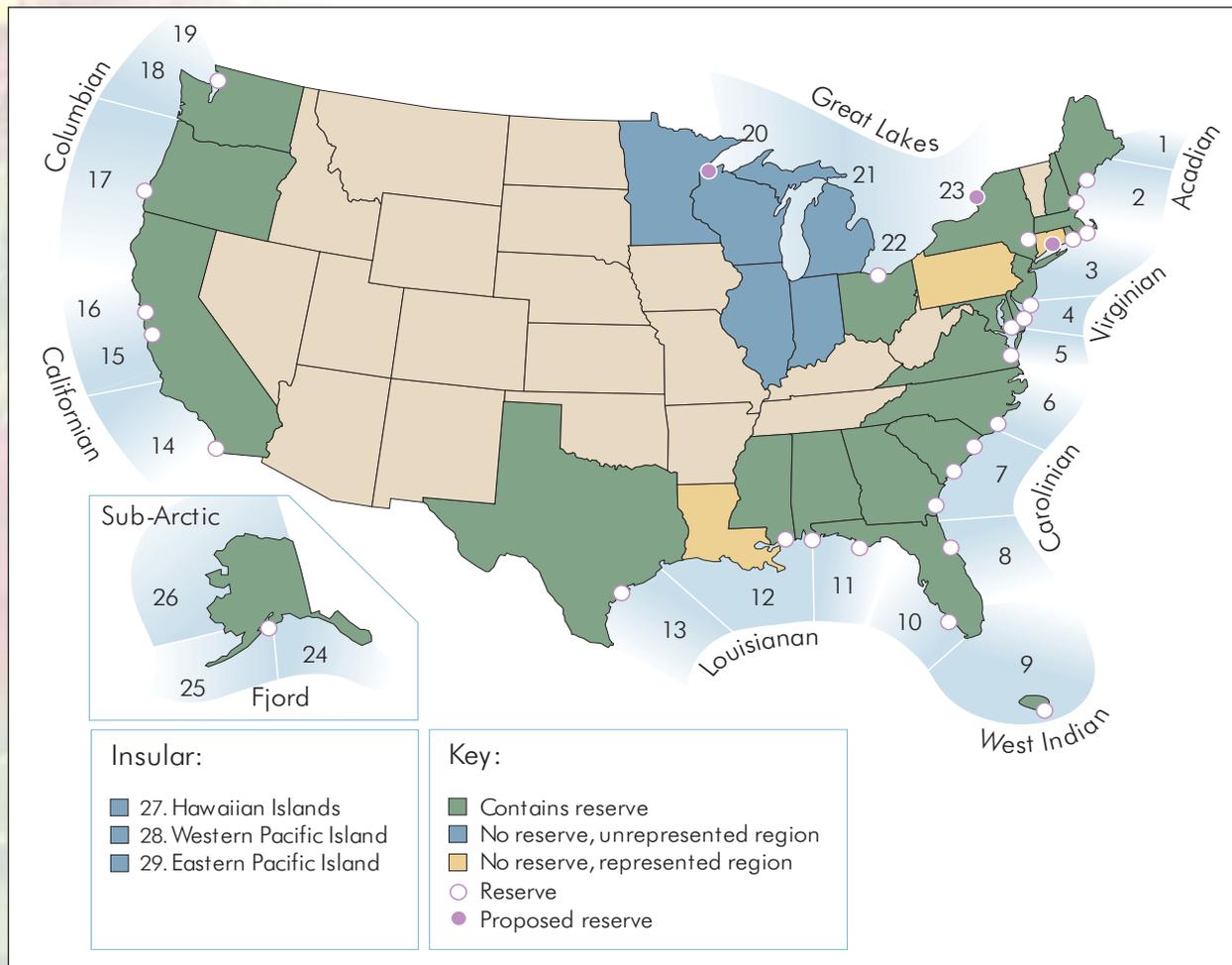
1. Ensure a stable environment for research through long-term protection of NERR resources;
2. Address coastal management issues identified as significant through coordinated estuarine research within the System;

3. Enhance public awareness and understanding of estuarine areas and provide suitable opportunities for public education and interpretation;
4. Promote federal, state, public and private use of one or more reserves within the System when such entities conduct estuarine research; and
5. Conduct and coordinate estuarine research within the System, gathering and making available information necessary for improved understanding and management of estuarine areas.

Similar to other NERR sites, the GTM Research Reserve serves as a platform for research and education and as a clearinghouse for science based information to guide the conservation of natural and cultural resources within the region. This is accomplished by conducting and facilitating scientific studies and symposia which in turn are used to guide the GTM Research Reserve's environmental education and stewardship programs. This process of adaptive management ensures that the best available information is provided to citizens, coastal managers and elected officials making decisions affecting coastal habitats. These activities also provide a mechanism for coordinated ecosystem management of lands within the GTM Research Reserve boundary and its watershed.

NERR System Strategic Goals 2005 to 2010 - The NERR System began a strategic planning process in 1994 in an effort to help NOAA achieve its environmental stewardship mission to "sustain healthy coasts." In conjunction with the strategic planning process, Estuarine Reserves Division (ERD) and Reserve staff has conducted a multi-year action planning process on an annual basis since 1996. The resulting three-year action plan provides an overall vision and direction for the Reserve system. As part of this process, the Reserve system developed a vision: Healthy estuaries and watersheds where coastal communities and ecosystems thrive; and mission: To practice and promote coastal and estuarine stewardship through innovative research and education, using a system of protected areas. The following three goals are outlined in the 2005-2010 Strategic Plan.

1. Strengthen the protection and management of representative estuarine ecosystems to advance estuarine conservation, research and education.



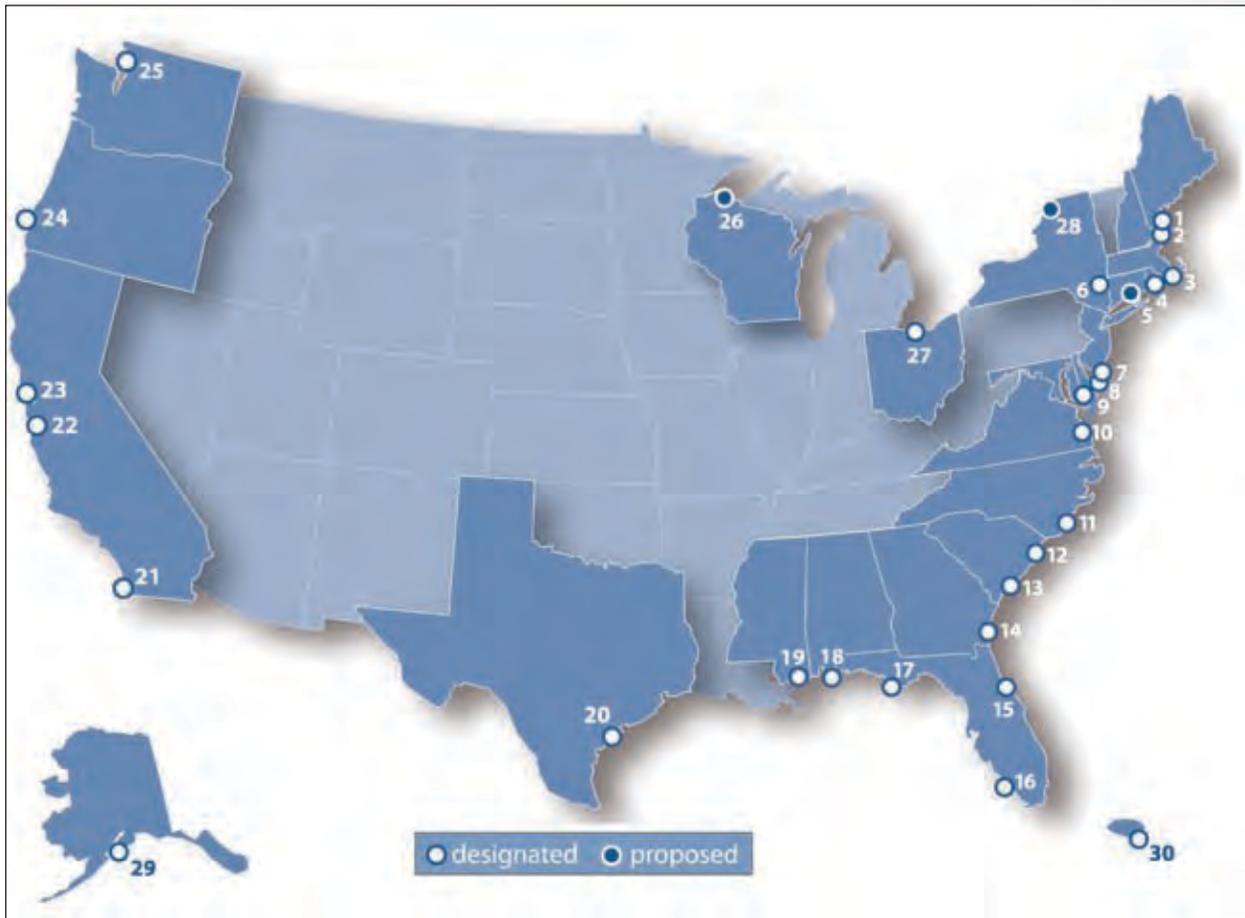


Figure 4 | NERR systems. (* designates proposed site)

- | | | |
|-----------------------------------|--|-----------------------------------|
| 1. Wells, Maine | 11. North Carolina | 21. Tijuana River, California |
| 2. Great Bay, New Hampshire | 12. North Inlet-Winyah Bay, South Carolina | 22. Elkhorn Slough, California |
| 3. Waquoit Bay, Massachusetts | 13. ACE Basin, South Carolina | 23. San Francisco, California |
| 4. Narragansett Bay, Rhode Island | 14. Sapelo Island, Georgia | 24. South Slough, Oregon |
| 5. Connecticut* | 15. Guana Tolomato Matanzas, Florida | 25. Padilla Bay, Washington |
| 6. Hudson River, New York | 16. Rookery Bay, Florida | 26. Wisconsin* |
| 7. Jacques Cousteau, New Jersey | 17. Apalachicola, Florida | 27. Old Woman Creek, Ohio |
| 8. Delaware | 18. Weeks Bay, Alabama | 28. St. Lawrence River, New York* |
| 9. Chesapeake Bay, Maryland | 19. Grand Bay, Mississippi | 29. Kachemak Bay, Alaska |
| 10. Chesapeake Bay, Virginia | 20. Mission-Aransas, Texas | 30. Jobos Bay, Puerto Rico |

2. Increase the use of Reserve science and sites to address priority coastal management issues.
3. Enhance peoples' ability and willingness to make informed decisions and take responsible actions that affect coastal communities and ecosystems.

The GTM Research Reserve is managed compatibly with the NERR's Program vision and 2005-2010 Strategic Goals.

The issue topic areas of the GTM Research Reserve's management plan (Watershed Landuse, Cultural Resource Preservation and Interpretation, Public Use, Habitat and Species Management and Global Processes) have a direct linkage with the National Program's priority management issues of land use and population growth, habitat loss and alteration, water quality degradation and changes in biological communities.

The GTM Research Reserve and other Reserves share the National Program's 2005- 2010 **Strategic Plan** - guiding Principles (http://www.nerrs.noaa.gov/Background_StrategicPlan.html):

- Strong partnerships between NOAA, state agencies and universities, and other local partners are critical to the success of the reserve system.
- The reserve system integrates science, education and stewardship on relevant topics to maximize the benefits to coastal management.
- Reserves serve as a catalyst and a focal point for demonstrating and facilitating objective problem solving and best management practices.
- Reserves engage local communities and citizens to improve stewardship of coastal areas.
- Reserves implement an ecosystem-based management approach.

NERR System National Programs

The three major elements of the Reserve System are:

- (1) Research on estuarine habitats and processes,
- (2) Education and interpretation of estuarine processes and
- (3) Resource stewardship.

NERR System Research and Monitoring Program

The Reserve System provides a mechanism for addressing scientific and technical aspects of coastal management problems through a comprehensive, interdisciplinary, and coordinated approach. Research and monitoring programs, including the development of baseline information, form the basis of this approach. Reserve research and monitoring activities are guided by national plans that identify goals, priorities, and implementation strategies for these programs. This approach, when used in combination with the education and outreach programs, will help ensure the availability of scientific information that has long-term, system-wide, consistency and utility for managers and members of the public to use in protecting or improving natural processes in their estuaries.

NERR System Research Funding Priorities

Federal regulations 15 C.F.R. 921.50(a) specify the purposes for which research funds are to be used:

- Support management-related research that will enhance scientific understanding of the Reserve ecosystem;
- Provide information needed by reserve managers and coastal ecosystem policy makers, and;
- Improve public awareness and understanding of estuarine ecosystems and estuarine management issues.

The Reserve System has identified the following five priority research areas to complement the funding priorities outlined above:

1. Habitat and ecosystem processes
2. Anthropogenic influences on estuaries
3. Habitat conservation and restoration
4. Species management
5. Social science and economics

NERR System Research Goals

The Reserve System research goals are embedded in Goal 2 of the Reserve System Strategic Plan 2005-2010, 'Increase the use of reserve science and sites to address priority coastal management issues,' and are outlined in the 2006-2011 Reserve System Research and Monitoring Plan. They include:

- Biological, chemical, physical, and ecological conditions of reserves are characterized and monitored to describe reference conditions and to quantify change.
- Scientists conduct research at reserves that is relevant to coastal management needs and increases basic understanding of estuarine processes.

- Scientists have access to NERRS datasets, science products and results.
- The scientific, coastal management and education communities, as well as the general public, use data, products tools, and techniques generated at the NERRS.

There are two reserve system efforts to fund research on the previously described areas.

The Graduate Research Fellow (GRF) Program supports students to produce high quality research in the reserves. The fellowship provides graduate students with funding for one to three years to conduct their research, as well as an opportunity to assist with the research and monitoring program in a reserve. Projects must address coastal management issues identified as having regional or national significance, relate them to the Reserve System research focus areas, and be conducted at least partially within one or more designated reserve sites. Students work with the research coordinator or manager at the host reserve to develop a plan to participate in the reserve's research and/or monitoring program. Students are asked to provide up to 15 hours per week of research and/or monitoring assistance to the reserve. This training may take place throughout the school year or may be concentrated during a specific season.

Secondly, research is funded through the Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET), a partnership between NOAA and the University of New Hampshire (UNH). CICEET uses the capabilities of UNH, the private sector, academic and public research institutions throughout the U.S., as well as the 27 reserves in the reserve system, to develop and apply new environmental techniques.

NERR System-Wide Monitoring Program (SWMP)

It is the policy of the GTM Research Reserve to implement each phase of the System-wide Monitoring Plan initiated by ERD in 1989, and as outlined in the reserve system regulations and strategic plan:

- Phase I: Environmental Characterization, including studies necessary for inventory and comprehensive site descriptions;
- Phase II: Site Profile, to include a synthesis of data and information; and
- Phase III: Implementation of the System-wide Monitoring Program.

The System-wide Monitoring Program provides standardized data on national estuarine environmental trends while allowing the flexibility to assess coastal management issues of regional or local concern. The principal mission of the monitoring program is to develop quantitative measurements of short-term variability and long-term changes in the integrity and biodiversity of representative estuarine ecosystems and coastal watersheds for the purposes of contributing to effective coastal zone management. The program is designed to enhance the value and vision of the reserves as a system of national reference sites. The program currently has three main components and the first is in operation.

1. **Abiotic Variables:** The monitoring program currently measures pH, conductivity, salinity, temperature, dissolved oxygen, turbidity, water level and atmospheric conditions. In addition the program collects monthly nutrient and chlorophyll A samples and monthly diel samples at one SWMP data logger station. Each reserve uses a set of automated instruments and weather stations to collect these data for submission to a centralized data management office.
2. **Biotic Variables:** The reserve system will incorporate monitoring of organisms and habitats into the monitoring programs as funds become available. The first aspects likely to be incorporated will quantify vegetation (e.g., marsh vegetation, submerged aquatic vegetation) patterns and their change over space and time. Other aspects that could be incorporated include monitoring infaunal benthic, nekton and plankton communities.
3. **Landuse, Habitat Mapping and Change:** This component will be developed to identify changes in coastal ecological conditions with the goal of tracking and evaluating changes in coastal habitats and watershed landuse/cover. The main objective of this element will be to examine the links between watershed land use activities and coastal habitat quality.

These data are compiled electronically at a central data management "hub", the Centralized Data Management Office (CDMO) at the Belle W. Baruch Institute for Marine Biology and Coastal Research of the University of South Carolina. They provide additional quality control for data and metadata and they compile and disseminate the data and summary statistics via the Web (<http://cdmo.baruch.sc.edu>) where researchers, coastal managers and educators readily access the information. The metadata meets the standards of the Federal Geographical Data Committee.

NERR System Education Program

The Reserve System provides a vehicle to increase understanding and awareness of estuarine systems and improve decision-making among key audiences to promote stewardship of the nation's coastal resources. Education and interpretation in the reserves incorporate a range of programs and methodologies that are systematically tailored to key audiences around priority coastal resource issues and incorporates science-based content. Reserve staff members work with local communities and regional groups to address coastal resource management issues, such as non-point source pollution, habitat restoration and invasive species. Through integrated research and education programs, the reserves help communities develop strategies to deal successfully with these coastal resource issues.

Formal and non-formal education and training programs in the NERRS target K-12 students, teachers, university and college students and faculty, as well as coastal decision-maker audiences such as environmental groups, professionals involved in coastal resource management, municipal and county zoning boards, planners, elected officials, landscapers, eco-tour operators and professional associations.

K-12 and professional development programs for teachers include the use of established coastal and estuarine science curricula aligned with state and national science education standards and frequently involve both on-site and in-school follow-up activity. Reserve education activities are guided by national plans that identify goals, priorities, and implementation strategies for these programs. Education and training programs, interpretive exhibits and community outreach programs integrate elements of NERRS science, research and monitoring activities and ensure a systematic, multi-faceted, and locally focused approach to fostering stewardship.

NERR System Education Goals

The National Estuarine Research Reserve System's mission includes an emphasis on education, interpretation and outreach. Education policy at the GTM Research Reserve is designed to fulfill the reserve system goals as defined in the regulations 15 C.F.R. 921.1 (b). Education goals include:

1. Enhance public awareness and understanding of estuarine areas and provide suitable opportunities for public education and interpretation;
2. Conduct and coordinate estuarine research within the system, gathering and making available information necessary for improved understanding and management of estuarine areas.

NERR system Education Objectives

Education-related objectives in the Reserve System Strategic Plan 2005-2010 include:

1. People are aware of the ecological, economic, historical, and cultural importance of estuarine resources.
2. People understand how human choices and natural disturbances impact social, economic, and estuarine ecological systems.
3. People apply science-based information when making decisions that could impact coastal and estuarine resources.

NERR System Coastal Training Program

The Coastal Training Program (CTP) provides up-to-date scientific information and skill-building opportunities to coastal decision-makers who are responsible for making decisions that affect coastal resources. Through this program, National Estuarine Research Reserves can ensure that coastal decision-makers have the knowledge and tools they need to address critical resource management issues of concern to local communities.

Coastal training programs offered by reserves relate to coastal habitat conservation and restoration, biodiversity, water quality and sustainable resource management and integrate reserve-based research, monitoring and stewardship activities. Programs target a range of audiences, such as land-use planners, elected officials, regulators, land developers, community groups, environmental non-profits, business and applied scientific groups. These training programs provide opportunities for professionals to network across disciplines and develop new collaborative relationships to solve complex environmental problems.

Additionally, the CTP provides a critical feedback loop to ensure that professional audiences inform local and regional science and research agendas. Programs are developed in a variety of formats ranging from seminars, hands-on skill training, participatory workshops, lectures and technology demonstrations. Participants benefit from opportunities to share experiences and network in a multidisciplinary setting, often with a reserve-based field activity.

Partnerships are important to the success of the Program. Reserves work closely with state coastal programs, Sea Grant College extension and education staff, and a host of local partners in determining key coastal resource issues to address, as well as the identification of target audiences. Partnerships with local agencies and organizations are critical in the exchange and sharing of expertise and resources to deliver relevant and accessible training programs that meet the needs of specific groups.

The Coastal Training Program requires a systematic program development process, involving periodic review of the reserve niche in the training provider market, audience assessments, and development of a three to five year program strategy, a marketing plan and the establishment of an advisory group for guidance, program review and perspective in program development. The CTP implements a performance monitoring system, wherein staff report data in operations progress reports according to a suite of performance indicators related to increases in participant understanding, applications of learning and enhanced networking with peers and experts to inform programs.

2.3 / Biogeographic Regions

NOAA has identified eleven distinct biogeographic regions and 29 subregions in the U.S., each of which contains several types of estuarine ecosystems (15 CFR Part 921, for NERR typology system, Figure 3).

The GTM Research Reserve is within the Carolinian biogeographic region within the east Florida subregion. The location's relatively pristine condition and unique climate and biodiversity are well suited to being designated as a Research Reserve. Community leaders along with state, federal and local governments have preserved extensive areas in the watershed of the GTM Research Reserve resulting in some of the country's most pristine freshwater, tidal creek and estuarine habitats. Consequently, the GTM Research Reserve provides a unique setting to conduct research and monitoring and to set goals for protecting and restoring other estuaries in the region.

Many species of subtropical and temperate plants and animals co-inhabit the GTM Research Reserve making it an ideal location to study climate change and other global ecological processes. The GTM Research Reserve also serves as an important habitat for migrating species including calving North American right whales and serves as a critical feeding and resting location for migrating shorebirds along the North American Atlantic flyway. In addition, the GTM Research Reserve is located in a region with the oldest record of European occupation and has a rich assortment of cultural resources dating to the pre-Columbian era, thereby providing a valuable resource for archaeological research and interpretation.

When complete, the NERR System will contain examples of estuarine hydrologic and biological types characteristic of each biogeographic region. As of 2007, the NERR System included 27 reserves and three reserves in the process of designation (Figure 4).

2.4 / Reserve Designation and Operation

Under Federal law (16 United States Code (U.S.C.) Section 1461), a state can nominate an estuarine ecosystem for Research Reserve status so long as the site meets the following conditions:

- The area is representative of its biogeographic region, is suitable for long-term research and contributes to the biogeographical and typological balance of the System;
- The law of the coastal State provides long-term protection for the proposed Reserve's resources to ensure a stable environment for research;
- Designation of the site as a Reserve will serve to enhance public awareness and understanding of estuarine areas, and provide suitable opportunities for public education and interpretation; and
- The coastal State has complied with the requirements of any regulations issued by the Secretary [of Commerce].

Reserve boundaries must include an adequate portion of the key land and water areas of the natural system to approximate an ecological unit and to ensure effective conservation.

If the proposed site is accepted into the Reserve system, it is eligible for NOAA financial assistance on a cost-share basis with the state. The state exercises administrative and management control, consistent with its obligations to NOAA, as outlined in a memorandum of understanding. A Reserve may apply to NOAA's ERD for funds to help support operations, research, monitoring, education/interpretation, stewardship, development projects, facility construction, and land acquisition.

2.5 / *Administrative Framework*

The National Estuarine Research Reserve System is a federal-state partnership program. The ERD of the Office of Ocean and Coastal Resource Management (OCRM) administers the reserve system. The OCRM is part of NOAA's National Ocean Service (NOS) (Figure 5). The Division establishes standards for designating and operating reserves, provides support for Reserve operations and system-wide programming, undertakes projects that benefit the reserve system, and integrates information from individual reserves to support decision-making at the national level. As required by Federal regulation, 15 CFR Part 921.40, OCRM (CZMA Section 312) periodically evaluates reserves for compliance with Federal requirements and with the individual Reserve's Federally-approved management plan.

The ERD currently provides support for four system-wide programs: the System-Wide Monitoring Program, the Graduate Research Fellowship Program, the K-12 Education Program, and the Coastal Training Program. They also provide support for Reserve initiatives on restoration science, invasive species, K-12 education, and Reserve specific research, monitoring, education, and resource stewardship initiatives and programs.

The state interest is represented through one or more state agencies, typically agencies charged with environmental, wildlife or coastal management responsibilities. States usually administer Reserve personnel and day-to-day Reserve management. For Florida, the agency that manages the NERRs is the Florida Department of Environmental Protection's Office of Coastal and Aquatic Managed Areas.



Figure 5 / Federal structure for managing national estuarine research reserves.



Aesthetics value, although hard to quantify, provides unique experiences supporting local tourism.

Chapter Three

The Florida Department of Environmental Protection's Office of Coastal and Aquatic Managed Areas

3.1 / Introduction

The DEP protects, conserves, and manages Florida's natural resources and enforces the State's environmental laws. The DEP is the lead agency in state government for environmental management and stewardship and commands one of the broadest charges of all the state agencies, protecting Florida's air, water, and land. The DEP is divided into three primary areas: Regulatory Programs, Land and Recreation, and Planning and Management. Florida's environmental priorities include restoring America's Everglades; improving air quality; restoring and protecting the water quality in our springs, lakes, rivers and coastal waters; conserving environmentally-sensitive lands; and providing citizens and visitors with recreational opportunities, now and in the future.

Coastal and Aquatic Managed Areas (CAMA) is the unit within the DEP that manages more than four million acres of submerged lands and select coastal uplands. This includes three National Estuarine Research Reserves (NERRs), forty-one aquatic preserves, the Florida Keys National Marine Sanctuary (FKNMS) and the Coral Reef Conservation Program (CRCP). The three NERRs, the Sanctuary, and the CRCP are managed in cooperation with the National Oceanic and Atmospheric Administration (NOAA).

CAMA manages sites in Florida for the conservation and protection of natural and historical resources and resource-based public use that is compatible with the conservation and protection of these lands. CAMA is a strong supporter of the NERR system and its approach to coastal ecosystem management. The State of Florida has three designated NERR sites, each encompassing at least one aquatic preserve within its boundaries. Rookery Bay NERR includes Rookery Bay Aquatic preserve and Cape Romano – Ten Thousand Islands Aquatic preserve; Apalachicola NERR includes Apalachicola Bay

Aquatic preserve; and Guana Tolomato Matanzas NERR includes Guana River Marsh Aquatic preserve and Pellicer Creek Aquatic preserve. These aquatic preserves provide discrete areas designated for additional protection beyond that of the surrounding NERR and may afford a foundation for additional protective zoning in the future.

Each of the Florida NERR managers serves as a regional manager overseeing multiple aquatic preserves in their region. This management structure advances CAMA's ability to manage its sites as a part of the larger statewide system.

3.2 / State Management Authority

Established by law, aquatic preserves are submerged lands of exceptional beauty that are to be maintained in their natural or existing conditions. The intent was to forever set aside submerged lands with exceptional biological, aesthetic, and scientific values as sanctuaries, called aquatic preserves, for the benefit of future generations.

The laws supporting aquatic preserve management are the direct result of the public's awareness of and interest in protecting Florida's aquatic environment. The rampant dredge and fill activities that occurred in the late 1960s spawned this widespread public concern. In 1966, the Trustees created the first aquatic preserve, Estero Bay, in Lee County.

In 1967, the Florida Legislature passed the Randall Act (Chapter 67-393, Laws of Florida), which established procedures regulating previously unrestricted dredge and fill activities on state-owned submerged lands. That same year, the legislature provided the statutory authority (§253.03, Florida Statutes (F.S.)) for the Trustees to exercise proprietary control over state-owned lands. Also in 1967, government focus on protecting Florida's productive water bodies from degradation due to development led the Trustees to establish a moratorium on the sale of submerged lands to private interests. An Interagency Advisory Committee (IAC) was created to develop strategies for the protection and management of state-owned submerged lands.

In 1968, the Florida Constitution was revised to declare in Article II, Section 7, the state's policy of conserving and protecting natural resources and areas of scenic beauty. That constitutional provision also established the authority for the legislature to enact measures for the abatement of air and water pollution. Later that same year, the IAC issued a report recommending the establishment of twenty-six aquatic preserves.

The Trustees acted on this recommendation in 1969 by establishing sixteen aquatic preserves and adopting a resolution for statewide system of such preserves. In 1975 the state legislature passed the Florida Aquatic preserve Act of 1975 (Act) that was enacted as Chapter 75-172, Laws of Florida, and later became Chapter 258, Part II, F.S. This Act codified the already existing aquatic preserves and established standards and criteria for activities within those preserves. Additional aquatic preserves were individually adopted at subsequent times up through 1989.

Originally adopted by the Trustees in 1981, the Conceptual State Lands Management Plan also provides essential guidance concerning the management of sovereignty lands and aquatic preserves and their important resources, including unique natural features, seagrasses, endangered species, and archaeological and historical resources. CAMA's management plans must be consistent with the Conceptual State Lands Management Plan.

Through delegation of authority from the Trustees, the DEP and CAMA have proprietary authority to manage the sovereignty lands, the water column, spoil islands (which are merely deposits on sovereignty lands), and some of the natural islands and select coastal uplands to which the Trustees holds title.

NERR sites include state-owned uplands in addition to sovereignty lands. Florida's first acquisition program was born in 1963 as the Land Acquisition Trust Fund (LATF), which funded the Outdoor Recreation and Conservation Program to purchase park and other recreational areas. The Environmentally Endangered Lands (EEL) program was created in 1972.

In 1979, the current Division of State Lands (DSL) was created within the Florida Department of Natural Resources, a predecessor agency to the DEP. The same year the legislature substantially amended Chapter 253, F.S., pertaining to the use and management of state lands and created the Conservation and Recreation Lands (CARL) program to replace EEL. CARL and its successors were eventually codified in Chapter 259, F.S. 1981 saw the establishment of the Save Our Coast (SOC) program, which augmented the LATF to focus on coastline purchases. CARL eventually subsumed the responsibilities of both SOC and LATF.

Preservation 2000 Program commenced in 1990 to fund CARL and other acquisition initiatives. Preservation 2000 was intended as a ten-year program and was succeeded by Florida Forever Program at the end of its course. Florida Forever has replaced CARL and continues to provide for the evaluation of land for acquisition and inclusion within the boundaries of Florida's three NERRs.

Enforcement of state statutes and rules relating to criminal violations and non-criminal infractions rests with the Florida Fish and Wildlife Conservation Commission (FWC) Marine Patrol, DEP law enforcement, and local law enforcement agencies. Enforcement of administrative remedies rests with CAMA, the DEP Districts, and Water Management Districts (WMD).

3.3 / State Statutory Authority

The fundamental laws providing management authority for the aquatic preserves are contained in Chapters 258 and 253, F.S. These statutes establish the proprietary role of the Governor and Cabinet, sitting as the Board of Trustees of the Internal Improvement Trust Fund (the Trustees), as Trustees over all sovereignty lands. In addition, these statutes empower the Trustees to adopt and enforce rules and regulations for managing all sovereignty lands, including aquatic preserves. The Florida Aquatic Preserve Act was enacted by the Florida Legislature in 1975 and is codified in Chapter 258, F.S.

The legislative intent for establishing aquatic preserves is stated in Section 258.36, F.S.: "It is the intent of the Legislature that the state-owned submerged lands in areas which have exceptional biological, aesthetic, and scientific value, as hereinafter described, be set aside forever as aquatic preserves or sanctuaries for the benefit of future generations." This statement, along with the other applicable laws, provides a foundation for the management of aquatic preserves. Management will emphasize the preservation of natural conditions and will include only sovereignty or state-owned lands that are specifically authorized for inclusion as part of an aquatic preserve.

Management responsibilities for aquatic preserves may be fulfilled directly by the Trustees or by staff of the DEP through delegation of authority. Other governmental bodies may also participate in the management of aquatic preserves under appropriate instruments of authority issued by the Trustees. CAMA staff serves as the primary managers who implement provisions of the management plans and rules applicable to the aquatic preserves. CAMA does not "regulate" the lands per se; rather, that is done primarily by the DEP Districts (in addition to the Water Management Districts (WMD) and the Division of Aquaculture in the Florida Department of Agriculture and Consumer Services (FDACS)), which grant regulatory permits and--through delegated authority from the Trustees--proprietary authorizations for certain public and private uses within the aquatic preserves. Staff evaluates proposed uses or activities in the aquatic preserve and assesses the possible impacts on the natural resources. Project reviews are primarily evaluated in accordance with the criteria in the Act, Chapter 18-20, F.A.C., and this management plan.

Staff comments and those of the public are submitted to the appropriate permitting staff for consideration in their issuance of any delegated authorizations in aquatic preserves or in developing recommendations to be presented to the Trustees. This mechanism provides a basis for the Trustees to evaluate public interest and the merits of any project while also considering potential environmental impacts to the aquatic preserves. Any activity located on sovereignty lands will require a letter of consent, a lease, an easement, or other approval from the Trustees.

The same authorities in Chapters 258 and 253, F.S., discussed above, provide management directives relevant to the NERRs. Of critical importance, Section 253.86 grants CAMA the explicit authority to promulgate rules for the management of uplands assigned to its management. Additionally, NERR management must take into account Chapter 259, F.S., which authorizes and governs acquisition and use of lands to conserve and protect important habitats, wildlife, water resources, and archaeological sites in accordance with the Land Conservation Act of 1972. Land managing agencies must prepare management plans in compliance with guidelines established in Chapter 259, F.S. Once again, the Trustees fulfill the proprietary management overview role for the NERRs, with management responsibilities assigned to staff acting as "agents" of the Trustees, pursuant to delegations of authority, management agreements, and other legal mechanisms. Typically, a lease agreement with the Trustees delegates management authority for the uplands assigned to the DEP and CAMA. Leases for Trustees lands within this NERR are included in Appendix B 7.

Many provisions of the Florida Statutes that empower non-CAMA programs within DEP or other agencies may be important to the management of CAMA sites. For example, Chapter 403, F.S., authorizes DEP to create rules concerning the designation of "Outstanding Florida Waters," a designation program that provides aquatic preserves with additional regulatory protection. Chapter 370, F.S., regulates

saltwater fisheries and provides enforcement authority and powers for law enforcement officers within the Florida Fish and Wildlife Conservation Commission (FWC). Chapter 597 F.S. regulates the use of submerged lands for aquaculture. Likewise, Chapter 372, F.S., provides similar powers relating to wildlife management. Because the NERR boundaries encompass areas directly managed by other state and federal agencies, interested parties should refer to the management plans produced by the relevant agencies for those parcels for a discussion of their legal authorities. The sheer number of statutes that affect NERR management prevents an exhaustive list of all such laws from being provided here.

3.4 / *State Administrative Rules*

Chapters 18-18, 18-20 and 18-21, F.A.C., are the three administrative rules directly applicable to the uses allowed in aquatic preserves specifically and sovereignty lands generally. These rules are intended to be cumulative, meaning that Chapter 18-21, F.A.C., should be read together with Chapter 18-18, F.A.C., or Chapter 18-20, F.A.C., to determine what activities are permissible within an aquatic preserve. If Chapter 18-18, F.A.C., or Chapter 18-20, F.A.C., are silent on an issue, Chapter 18-21, F.A.C., will control; if a conflict is perceived between the rules, the stricter standards of Chapter 18-18, F.A.C., or Chapter 18-20, F.A.C., supersede those of Chapter 18-21, F.A.C. Because Chapter 18-21, F.A.C. concerns all sovereignty lands, it is logical to discuss its provisions first.

Originally codified in 1982, Chapter 18-21, F.A.C., is meant “to aid in fulfilling the trust and fiduciary responsibilities of the Board of Trustees of the Internal Improvement Trust Fund for the administration, management and disposition of sovereignty lands. The intent of this legislation is 1) to ensure maximum benefit and use of sovereignty lands for all the citizens of Florida; 2) to manage, protect, and enhance sovereignty lands so that the public may continue to enjoy traditional uses including, but not limited to, navigation, fishing, and swimming; to manage and provide maximum protection for all sovereignty lands, especially those important to public drinking water supply, shellfish harvesting, public recreation, and fish and wildlife propagation and management; 3) to ensure that all public and private activities on sovereignty lands which generate revenues or exclude traditional public uses provide just compensation for such privileges; and 4) to aid in the implementation of the State Lands Management Plan.”

To that end, Chapter 18-21, F.A.C., contains provisions on general management policies, forms of authorization for activities on sovereignty lands, and fees applicable for those activities. “Activity,” in the context of the rule, includes “construction of docks, piers, boat ramps, board walks, mooring pilings, dredging of channels, filling, removal of logs, sand, silt, clay, gravel or shell, and the removal or planting of vegetation.” (Rule 18-21.003, F.A.C.) To be authorized on sovereignty lands, activities must be not contrary to the public interest. (Rule 18-21.004, F.A.C.)

Chapter 18-21, F.A.C., also sets policies on aquaculture, geophysical testing, and special events related to boat shows and boat displays. Of particular importance to CAMA site management, it additionally addresses spoil islands, preventing their development in most cases.

Chapters 18-18 and 18-20, F.A.C., apply standards and criteria for activities in the aquatic preserves that are stricter than those of Chapter 18-21, F.A.C. Chapter 18-18, F.A.C., is specific to the Biscayne Bay Aquatic preserve and is more extensively described in that site’s management plan. Chapter 18-20, F.A.C., is applicable to all other aquatic preserves. It further restricts the type of activities for which authorizations may be granted for use of sovereignty lands and requires that structures that are authorized be limited to those necessary to conduct water dependent activities. Moreover, for certain activities to be authorized, “it must be demonstrated that no other reasonable alternative exists which would allow the proposed activity to be constructed or undertaken outside the preserve.” (Paragraph 18-20.004(1)(g), F.A.C.)

Chapter 18-20, F.A.C., expands on the definition of “public interest” by outlining a balancing test that is to be used to determine whether benefits exceed costs in the evaluation of requests for sale, lease, or transfer of interest of sovereignty lands within an aquatic preserve. The rule also provides for the analysis of the cumulative impacts of a request in the context of prior, existing, and pending uses within the aquatic preserve, including both direct and indirect effects.

Chapter 18-20, F.A.C., directs management plans and resource inventories to be developed for every aquatic preserve. Further, the rule provides provisions specific to certain Aquatic preserves and indicates the means by which the Trustees can establish new or expand existing Aquatic preserves.

NERRs, because they manage uplands in addition to their oversight of sovereignty lands within Aquatic preserves, must follow the provisions of Chapter 18-2, F.A.C., Chapter 18-23, F.A.C., and Chapter 18-24, F.A.C. Chapter 18-2, F.A.C., establishes policies concerning use of uplands owned by the Trustees and

managed by state entities. Originally codified in 1996, this rule expands upon the guidelines set forth in the Conceptual State Lands Management Plan. It requires that uses of the uplands be not contrary to the public interest and mandates that direct and indirect impacts and cumulative effects be considered as part of the public interest determination.

Chapter 18-23, F.A.C., supplements Chapter 18-2, F.A.C., by establishing guidelines and criteria specifically for uplands managed by CAMA. It limits certain activities on these uplands, such as hunting and admission of pets, “to conserve, preserve and restore the natural and cultural resources and ensure the safety and enjoyment of visitors.” (Subsection 18-23.007(2), F.A.C.) The rule provides a schedule of fines for violations of these policies, which are considered non-criminal infractions.

Chapter 18-24, F.A.C., delineates procedures specific to the use of monies from the Florida Forever Trust Fund for the acquisition and restoration of uplands. It also prescribes the procedures that are to be followed by the Acquisition and Restoration Council in advising the Trustees in administering the Florida Forever Program.

As with statutes, Aquatic preserve management relies on the application of many other DEP and outside agency rules. Perhaps most notably, Chapter 62-302, F.A.C., concerns the classification of surface waters, including criteria for “Outstanding Florida Waters” (OFW), a designation that provides for the State’s highest level of protection for water quality. An Outstanding Florida Water, (OFW), is a water body designated worthy (under authority of Section 403.061 (27), F.S.) of special protection because of its natural attributes and is intended to protect existing good water quality. All Aquatic preserves contain OFW designations. No activity may be permitted within an OFW that degrades ambient water quality unless the activity is determined to be in the public interest.



Natural lighting is essential for conserving natural biodiversity and also benefits photographers and other artists.

Chapter Four

The Guana Tolomato Matanzas National Estuarine Research Reserve (GTM Research Reserve)

4.1 / Acquisition and Designation History of the GTM Research Reserve

In 1957, the state of Florida, through the Florida Game and Fresh Water Fish Commission, leased approximately 12,000 acres, the bulk of the Guana River peninsula, from several investment companies. In 1982 the property was purchased by Gate Petroleum from Stockton, Whatley, Davin & Co., which was then owned by Phillips Petroleum Company.

Two years later, in 1984, the state of Florida purchased through its Conservation and Recreation Lands and Save Our Coast programs approximately 12,000 acres of the Guana River peninsula for \$48 million dollars. The Guana River system was designated an aquatic preserve in 1985 for the primary purpose of preserving the biological resources in the area and maintaining these resources in their essentially natural condition.

Under the state's ownership, on January 8, 1988, BTIITF conveyed management authority of Guana River State Park (approximately 2,488.98) acres to the Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) under Lease No. 3462.

The site selection process for Florida's east coast Research Reserve began in September of 1991, with the identification of candidate estuaries in the Florida East Coast Carolinian and West Indian biogeographic regions identified by the National Estuarine Research Reserve (NERR) System. The Guana Tolomato Matanzas ecosystem was selected as the preferred alternative by a committee of scientists, environmental educators, and coastal managers on the basis of its overall potential for scientific research and environmental education opportunities and because of its relative pristine condition. The GTM Research Reserve's ultimate purpose is to serve as a platform for research that guides environmental education and stewardship programs focused on the conservation of northeast Florida's unique natural and cultural resources.

After obtaining support from the citizens and legislators of St. Johns and Flagler counties, the Governor and Cabinet of the State of Florida nominated the estuarine ecosystem composed of the Guana, Tolomato, and Matanzas Rivers for designation as a NERR. The GTM Research Reserve was officially designated on August 19, 1999. Presently this designation includes 12 distinct management units; two of these are directly managed by the Office of Coastal and Aquatic Managed Areas (CAMA) (Pellicer

Creek Aquatic Preserve (PCAP) and portions of the Guana River Marsh Aquatic Preserve (GRMAP). On December 15, 2003 the BTIITF assigned, transferred and conveyed 100% of the title and interest of Lease No. 3462 (formally DEP/DRP's Guana River State Park) to DEP/CAMA for the remainder of the terms of the lease. This lease will expire on January 8, 2038.

In addition, the GTM Research Reserve is also responsible for managing State sovereign submerged lands within the Matanzas River and its tributaries inside the GTM Research Reserve designated boundary (Florida Department of Environmental Protection, 1998). This plan is the first update to the GTM Research Reserve management plan (BTIITF Approved November 10th, 1998).

4.2 / Resource Description

4.2.1 / GTM Research Reserve Mission

The GTM Research Reserve's mission is to achieve the conservation of natural biodiversity and cultural resources by using the results of research and monitoring to guide science-based stewardship and education strategies.

4.2.2 / International/National/State/Regional Significance

The diversity of communities present in the GTM Research Reserve provides habitat for a wide variety of fish and wildlife. A species list recently compiled for the GRMAP indicates the presence of at least 44 mammal, 358 bird, 41 reptile, 21 amphibian, 303 fish, and 580 plant species. Many more species are expected to occur in the GTM Research Reserve.

The GTM Research Reserve contains habitats essential to many protected species (eight plants and forty-eight animals) including the Anastasia Island beach mouse (*Peromyscus polionotus phasma*), gopher tortoise (*Gopherus polyphemus*), least tern (*Sterna antillarum*), marine turtles: loggerhead (*Caretta caretta*), leatherback (*Dermochelys coriacia*) and green turtle (*Chelonia mydas*), and North Atlantic right whale (*Eubalaena glacialis*). In addition, the striped newt (*Notophthalmus perstriatus*), one of Florida's rarest vertebrate species, occurs within the GTM Research Reserve. Some of the many rare listed birds of the GTM Research Reserve include: great egret (*Ardea alba*), white ibis (*Eudocimus albus*), black-crowned night heron (*Nycticorax nycticorax*), least tern (*Sterna antillarum*), bald eagle (*Haliaeetus leucocephalus*), tricolored heron (*Egretta tricolor*), wood stork (*Mycteria americana*) and roseate spoonbill (*Ajaia ajaja*). The rare Atlantic geoduck (*Panopea bitruncata*) has also been recorded in the GTM Research Reserve. The GTM Research Reserve continues to expand its role to facilitate and conduct research and monitoring, stewardship and education strategies designed to enhance our ability to monitor the condition of these species and to conserve their habitats.

Many species of commercial value are known to use the GTM Research Reserve's estuary for all or part of their life cycle. These species include oysters (*Crassostrea virginica*), quahog clams (*Mercenaria spp.*), blue crabs (*Callinectes sapidus*), stone crabs (*Menippe mercenaria*), white shrimp (*Penaeus setiferus*), brown shrimp (*Penaeus aztecus*), striped and white mullet (*Mugil cephalus* and *M. curema*), gag grouper (*Myctoperca microlepis*), black sea bass (*Centropristis striata*), gray snapper (*Lutjanus griseus*), lane snapper (*L. synagris*), flounder (*Paralichthys lethostigma* and *P. dentatus*), bluefish (*Pomatomus saltatrix*), menhaden (*Brevoortia tyrannus*) and thread herring (*Opisthonema oglinum*). Management strategies to conserve and restore natural habitats supporting sustainable populations of these species are an important management priority for the GTM Research Reserve.

Recreationally valuable species provide a valuable economic incentive for long-term conservation of the GTM Research Reserve's natural resources. Species important to the local sports fishery that are found in the GTM Research Reserve include tarpon (*Tarpon atlanticus*), spotted sea trout (*Cynoscion nebulosus*), weakfish (*C. regalis*), snook (*Centropomus undecimalis*), red drum (*Sciaenops ocellata*), black drum (*Pogonias cromis*), spot (*Leiostomus xanthurus*), croaker (*Micropogon undulatus*), sheepshead (*Archosargus probatocephalus*), crevalle jack (*Carynx hippos*), gag grouper (*Myctoperca microlepis*), black sea bass (*Centropristis striata*), gray snapper (*Lutjanus griseus*), lane snapper (*L. synagris*), Florida pompano (*Trachinotus carolinus*), flounder (*Paralichthys sp.*), striped mullet (*Mugil cephalus*), and sailor's choice (*Haemulon parri*). Habitat and species management based on the best available scientific information is required to sustain this valuable resource.

In addition to these natural resources the GTM Research Reserve contains a unique array of cultural resources. This ecosystem has been used by humans for over 5,000 years (Baker, 1988; Newman, 1995). Artifacts found in the GTM Research Reserve area range from an arrowhead from the late Archaic (2500-1000 BC) to pottery from the 19th century.

4.2.3 / Location/Boundaries

The GTM Research Reserve is located south of the City of Jacksonville (Duval County) in St. Johns County and Flagler County on the northeast coast of Florida. The GTM Research Reserve is geographically separated into a northern and southern component, separated by the City of St. Augustine (Figure 1, Page 2). The northern component (referred to locally as Guana) is associated with the Tolomato and Guana River estuaries and the southern component is associated with the Matanzas River. The northern component consists of GRMAP, Guana River Wildlife Management Area (GRWMA), Stokes Landing Conservation Area and Deep Creek State Forest. The GTM Environmental Education Center (EEC) is located in the northern component of the GTM Research Reserve ten miles north of St. Augustine on State Road A1A in Ponte Vedra Beach, and serves as the administrative, education, research, and stewardship facilities for the northern component of the GTM Research Reserve. The southern component of the GTM Research Reserve consists of PCAP, Faver-Dykes State Park, Washington Oaks Gardens State Park, Moses Creek Conservation Area, Pellicer Creek Conservation Area, Fort Matanzas National Monument, Princess Place Preserve, The River to Sea Preserve at Marineland, and other State sovereign submerged lands within the Matanzas River and its tributaries inside the GTM Research Reserve designated boundary that were classified as Class II or Outstanding Florida Waters as of 1998 (Chapter 17-302.600(3)(b)55 and 17-302.600(3)(b)18 F.A.C.; Florida Department of Environmental Protection, 1998). This area includes tidally submerged State sovereign adjacent to and within the Intracoastal Waterway and its tributaries, excluding the Treasure Beach Canal System - from Intracoastal Waterway marker number 29, south to an east-west line through marker number 109). The Board of Trustees of the Internal Improvement Trust Fund (the Trustees) has designated CAMA to manage the GRMAP (excluding the Guana River Wildlife Management Area) and the PCAP. Copies of the management lease agreement can be seen by contacting the Research Reserve, the Office of Coastal and Aquatic Managed Areas, or DEP's Division of State Lands.

4.2.4 / Adjacent Public Lands and Conservation Areas

Northern Component

Adjacent to and within the watershed of GRMAP are significant public lands managed by various state and local agencies (Figure 6). Adjacent public lands include GRWMA, Deep Creek State Forest, Stokes Landing Conservation Area, Nocatee Preserve, Davis Park, and a portion of the Twelve Mile Swamp Tract including the Twelve Mile Swamp Wildlife Management Area and Conservation Area.

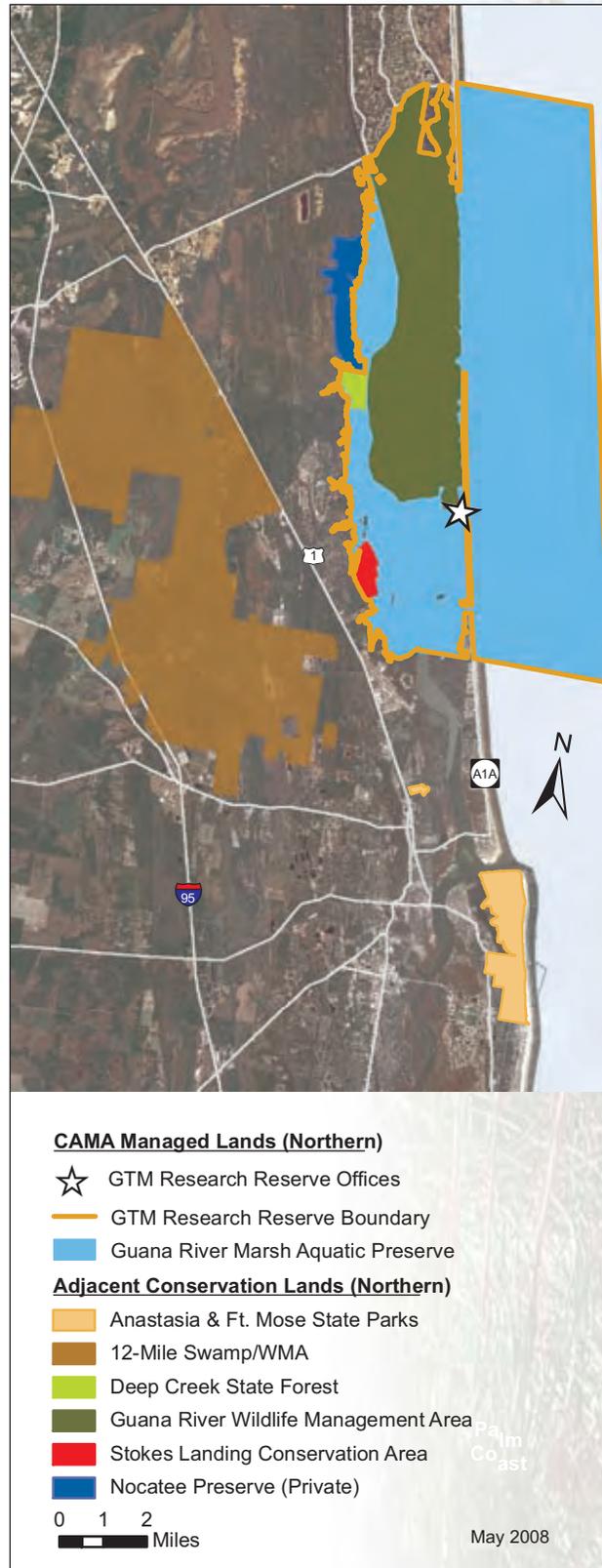
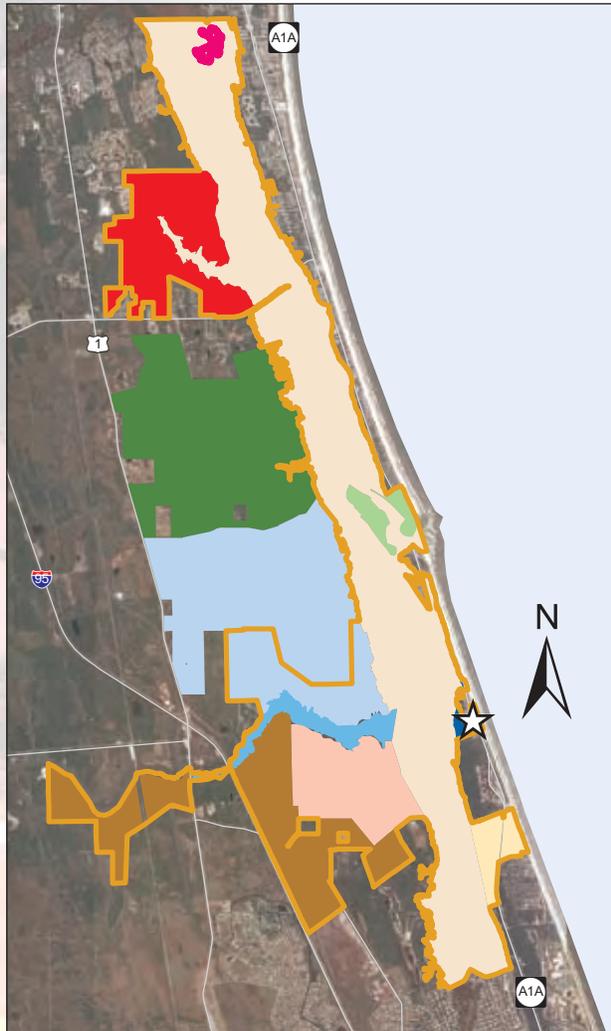


Figure 6 / Adjacent public lands and resources of the GTM Research Reserve's northern component.

Nocatee Preserve is a 2,400 acre parcel of salt marsh, floodplain forest, and silviculture donated to St Johns County by the PARC Corporation, developers of the town of Nocatee. The purpose of this parcel is to provide conservation of wildlife and passive recreation. The preserve is adjacent to the northwestern boundary of the GRMAP providing three miles of natural shoreline and serving as a buffer to the developments of Nocatee.



CAMA Managed Lands (Southern)

- GTM Research Reserve Boundary
- GTM Research Reserve Southern Component
- Pellicer Creek Aquatic Preserve
- ☆ GTM Research Reserve Office (Marineland)

Adjacent Conservation Lands (Southern)

- River To Sea Preserve
- Faver-Dykes State Park
- Ft. Matanzas National Monument
- Matanzas State Forest
- Moses Creek Conservation Area
- Pellicer Creek Conservation Area
- Princess Place Preserve
- Washington Oaks Gardens State Park
- Greenberg Property

0 1 2 Miles

May 2008

Davis Park is a 138 acre county park located west of the GRMAP along County Road (CR) 210, (Palm Valley) road. This park is developed for recreational activities including baseball fields, soccer fields, softball fields, and football fields. The natural portions of the park include freshwater wetlands and pine silviculture.

Twelve Mile Swamp tract is comprised of the 21,898 acre Twelve Mile Swamp Wildlife Management Area and the 378 acre Twelve Mile Swamp Conservation Area. This entire tract is currently under a long-term timber reservation. Approximately 700 acres of this tract lie within the watershed of the GRMAP.

Stokes Landing Conservation Area is 274.04-acres. The conservation area is located in St. Johns County, approximately 3 miles north of downtown St. Augustine. This area is open to the public for recreational activities such as hiking, bicycling, wildlife viewing, and fishing.

Southern Component

The immediate watershed of PCAP is composed almost entirely of conservation lands including Matanzas State Forest, Faver Dykes State Park, Pellicer Creek Conservation Area, and the Princess Place Preserve.

This PCAP is bounded almost entirely by conservation lands (Figure 7). On the north bank from Faver Dykes State Park to I-95, and between I-95 and US-1 upland property is owned by local residents. At this point in time, limited upland development and low usage of Pellicer Creek have minimized existing human-associated disturbance.

Fort Matanzas National Monument is located about 15 miles south of the historic district of St. Augustine, Florida on SR A1A. Fort Matanzas guarded the southern inlet leading to the first permanent European settlement in continental United States. As such, Fort Matanzas represents one of the oldest and most well preserved historical structures within GTM Research Reserve. The original national monument site consisted of only the fort on Rattlesnake Island. Through the years, however, the National Park Service has been able to acquire additional land both on Rattlesnake and on Anastasia Island to set aside a slice of an intact barrier island ecosystem. The river and ocean beaches as well as the .6 mile nature trail offer visitors the opportunity to view a variety of plants and wildlife native to this ecosystem.

Figure 7 | Adjacent public lands and resources of the GTM Research Reserve's southern component.

Washington Oaks Gardens State Park is located in Flagler County about 20 miles south of the City of St. Augustine. The park is bordered by the Atlantic Ocean on the east and the Atlantic Intracoastal Waterway (AIWW) on the west and consists of 423.31 acres. In the management of Washington Oaks Gardens State Park emphasis is placed on the natural and cultural resources and the maintenance and enhancement of the gardens. Recreational uses are passive. Development in the park has been limited to the gardens, picnicking, nature trails and necessary support facilities. Park programs emphasize interpretation of the park's natural and cultural attributes.

Faver-Dykes State Park is located in St. Johns County and is bordered east, north and south with conservation lands. Although some of this property was logged prior to state purchase and is being restored, the overall significance of this property remains. At Faver-Dykes State Park, public outdoor recreation and conservation is the designated use of the property. Faver-Dykes State Park contains 6,045.89 acres.

Moses Creek Conservation Area is located in St. Johns County south of St. Augustine and is within the Northern Coastal Basin. The property lies in the area of confluence of Moses Creek and the Matanzas River. The property is bounded to the north by a housing development, to the west by schools, and to the south by small neighborhoods and SR 206. The eastern boundary of the property is the Matanzas River. Moses Creek Conservation Area comprises approximately 2,173 acres.

Pellicer Creek Conservation Area is located in northeastern Flagler County, lies along the southern shoreline of Pellicer Creek and contains approximately 2,997 acres. The site has about 6.3 miles of frontage along Pellicer Creek and is located approximately 1.5 miles west of the Matanzas River, which is part of the Intracoastal Waterway.

The Princess Place Preserve, managed by Flagler County, is located on a knoll overlooking the confluence of Pellicer Creek and the Intracoastal Waterway, the estate was once home to a Russian Princess. It was built as a hunting lodge in 1886 by Henry Cutting and is the oldest standing structure in the county. Princess Place has a rich history and contains 1500 pristine acres.

The River to Sea Preserve, also managed by Flagler County, is located on both sides of SR A1A in Marineland. It is jointly owned by Flagler County and the Town of Marineland. Beginning at the beach of the Atlantic Ocean and reaching west to the Matanzas River (Atlantic Intracoastal Waterway), the River to Sea Preserve protects a rapidly disappearing maritime scrub environment. The 90 acre preserve offers walking trails nature vistas, ecological education opportunities as well as public access to the beach.

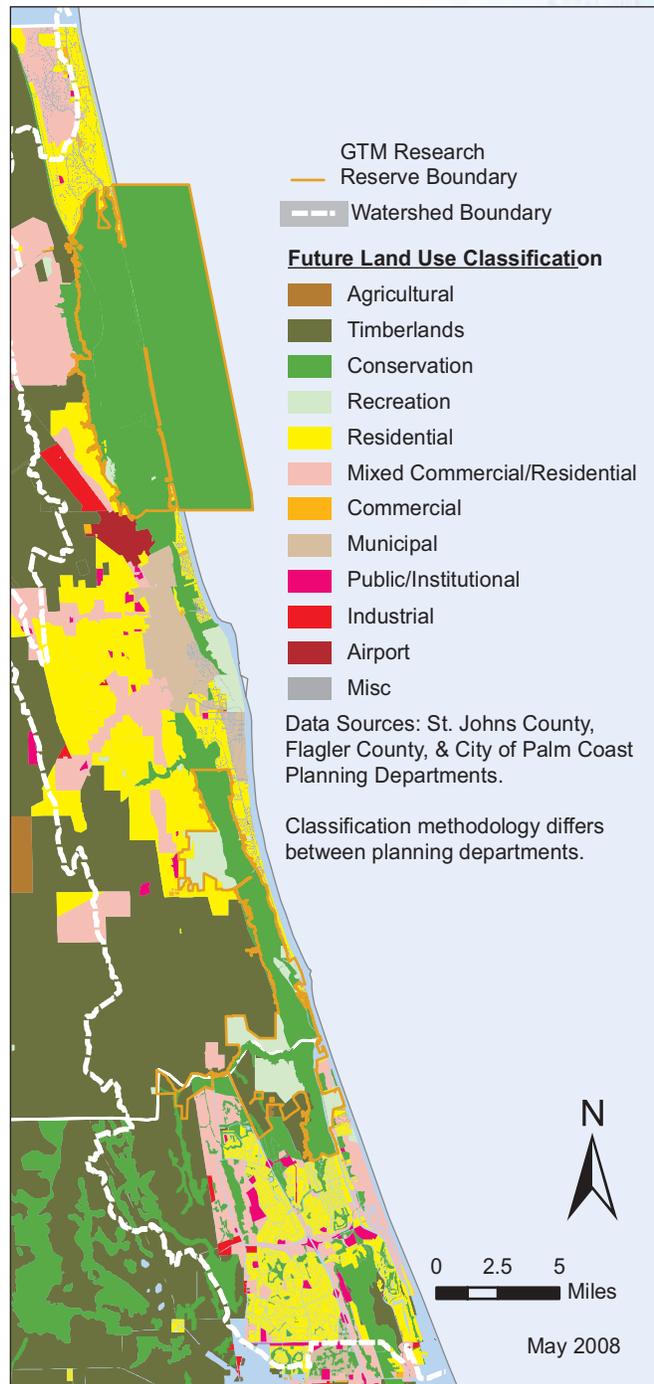


Figure 8 | Projected future land use adjacent to the GTM Research Reserve.

4.2.5 / Surrounding Demographic Data and Future Projections

The populations of St. Johns County and the adjacent Flagler, Putnam, and Volusia counties have grown 25 percent since 1990, and are projected to grow an additional 20 percent by 2010 (BEBR, University of Florida, 2002; Figure 8). As of 2000, 17 percent of residents in these counties were in the 0-14 age group, 36.4 percent in the 15-44 age group, 25.6 percent in the 45-64 age group, and 21 percent were aged 65 and over, which is a higher state average for the 45 and older groupings (BEBR, University of Florida, 2002). Nearly 1,339,800 people reside within 50 miles of the GTM Research Reserve, which includes the cities of Jacksonville, St. Augustine, Palatka, Daytona and New Smyrna (U.S. Bureau of the Census, 2000).

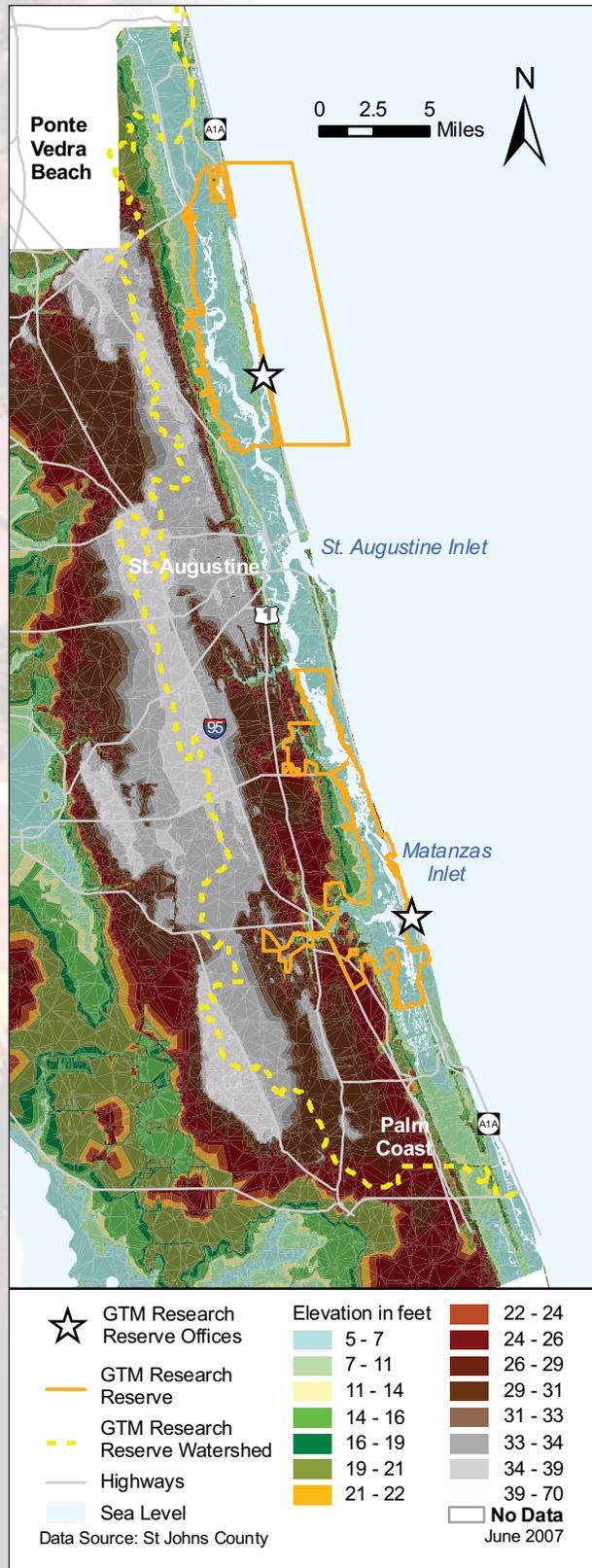


Figure 9 / Topography of the watershed of the GTM Research Reserve.

Increasing development will most likely affect the timing, quantity and quality of freshwater entering the PCAP. More than 1 million people live within a 60 mile radius of Pellicer Creek. The northeast Florida region (Baker, Clay, Duval, Flagler, Nassau, Putnam and St. Johns counties) is one of the fastest growing regions in the state. It has experienced a 22 percent increase in population between 1990 and 2000. By 2015, the region is expected to grow by an additional 20 percent. In addition, over 3 million tourists visited the region in 2006.

According to the US Census Bureau, Flagler County's population increased 53 percent over a five-year period from 2001-2006. The population of St. Johns County grew by 47 percent between 1990 and 2000. Residential development and the infrastructure necessary to support these developments will impact the amount of impervious surface in the watershed and adversely affect the levels of nonpoint source pollutants entering the aquatic preserve.

To meet the challenges associated with increased development and population the GTM Research Reserve must work cooperatively with local, state and national partners to ensure the best available science-based information is used to make decisions affecting coastal resources. The goal of the research with respect to watershed issues is to reduce the impact of watershed landuse on coastal resources by identifying priority pollutants and encouraging best management practices in partnership with state, federal and local agencies, colleges and universities, private industry and citizens. Specific research, stewardship and education strategies will be presented in the issue characterization section of this plan.

4.2.6 / Topography and Geomorphology

The GTM Research Reserve's coastal estuaries are bounded to the west by the Pamlico Terrace, which has an elevation of 5 to 25 feet above sea level. The topography present today was formed over the last 10,000 years and is composed of remnant beach and dune ridges, swamps, marshes, tidal flats, creeks, rivers, and estuarine

lagoon bottoms (Figure 9). The elevation within the GTM Research Reserve ranges from sea level to 40 feet on the dunes within its northern component and in the central regions of the Pellicer Creek Conservation Area.

The GTM Research Reserve is located in the lower part of the Atlantic Coastal Plain. The coastal region occupies a physiographic division known as the Coastal Lowlands. This region of the Florida Plateau is described by Cooke (1945) as a belt of land along the coast, extending 30 to 60 miles inland, that is flat, poorly drained, and characterized by the ancient marine terraces and dune ridges.

There are seven or possibly eight marine terraces, each formed at different sea levels during the Pleistocene epoch (White, 1970). These terraces were formed prehistorically by waves, currents, and the rise and fall of sea levels. When the sea level remained stationary for long periods, the waves and currents would erode the sea floor to form a fairly level surface. Each time the sea level dropped, a part of the sea floor was exposed as a level plain or terrace. The terraces tend to be parallel to the present Atlantic shoreline and become progressively higher from east to west (Kojima and Hunt, 1980; Figure 10). Over time the level plains of the terraces were modified or destroyed by stream erosion.

As with all of coastal Florida, changes in sea level and climate can have significant impacts on salt water intrusion, storm surge, coastal erosion and habitat loss. The GTM Research Reserve is well suited to serve as a clearinghouse of information concerning global and meteorological processes affecting coastal habitats of northeast Florida through partnerships with state, federal and local agencies, academic institutions, private industry and citizens.

4.2.7 / Geology

The GTM Research Reserve overlies typical Floridian coastal geologic strata. The ground is covered with Holocene epoch sediments (< 10,000 years old) including sand, clay and shell fragments. Older limestone from the Anastasia formation is exposed on the southern beach in the GRMAP (east of Sombrero Creek). These rocks date from the Pleistocene epoch, which occurred from 1.8 million years ago (MYA) to 10,000 years ago (Florida Geological Survey (FGS) Lithologic Database).

Beneath these surface sediments lies the Hawthorn group (Miocene epoch, 24-5.3 MYA). The Hawthorn group is made up of clays and dolomite, and acts as a semi-confining layer atop the Floridan aquifer. The Hawthorn group is thickest under the GRMAP, ranging in depth from 130 to 300 feet. It is thinner to the south, where it ranges in depth from 99 to 137 feet under the southern portion of the GTM Research Reserve (Florida Geological Survey Lithologic Database).

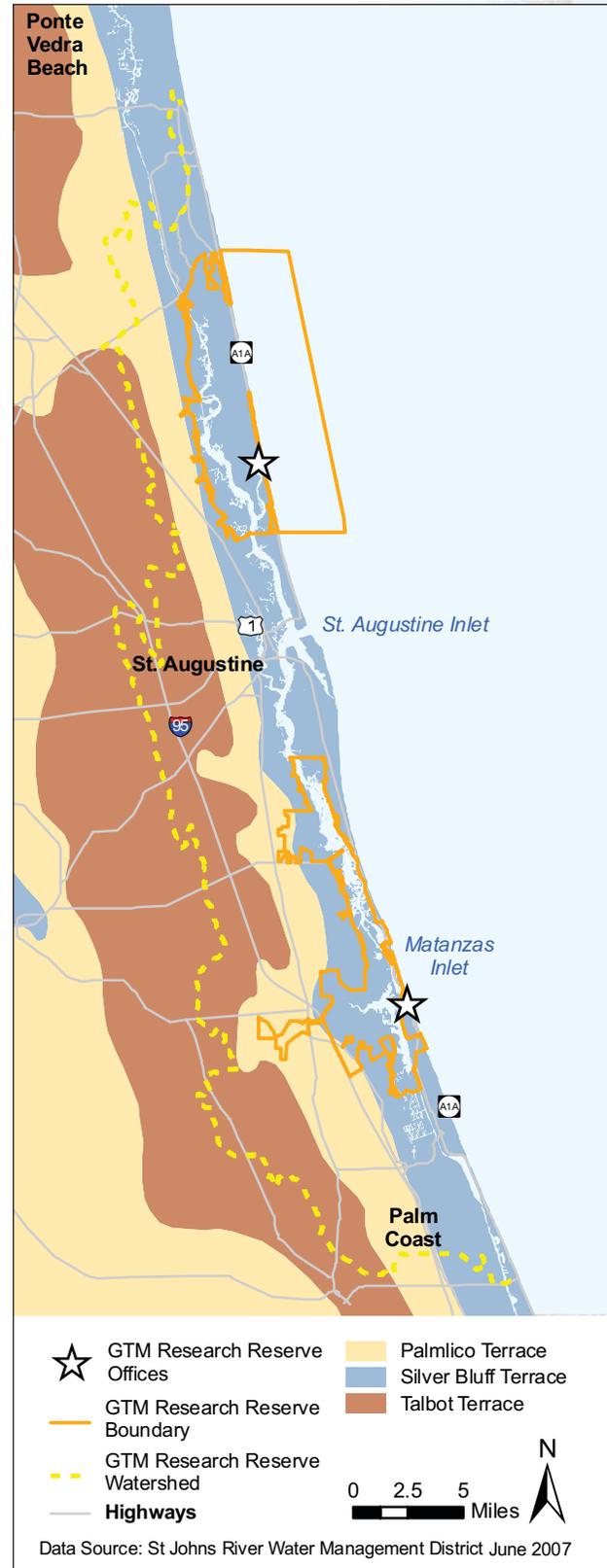


Figure 10 | Geomorphology of the watershed of the GTM Research Reserve.

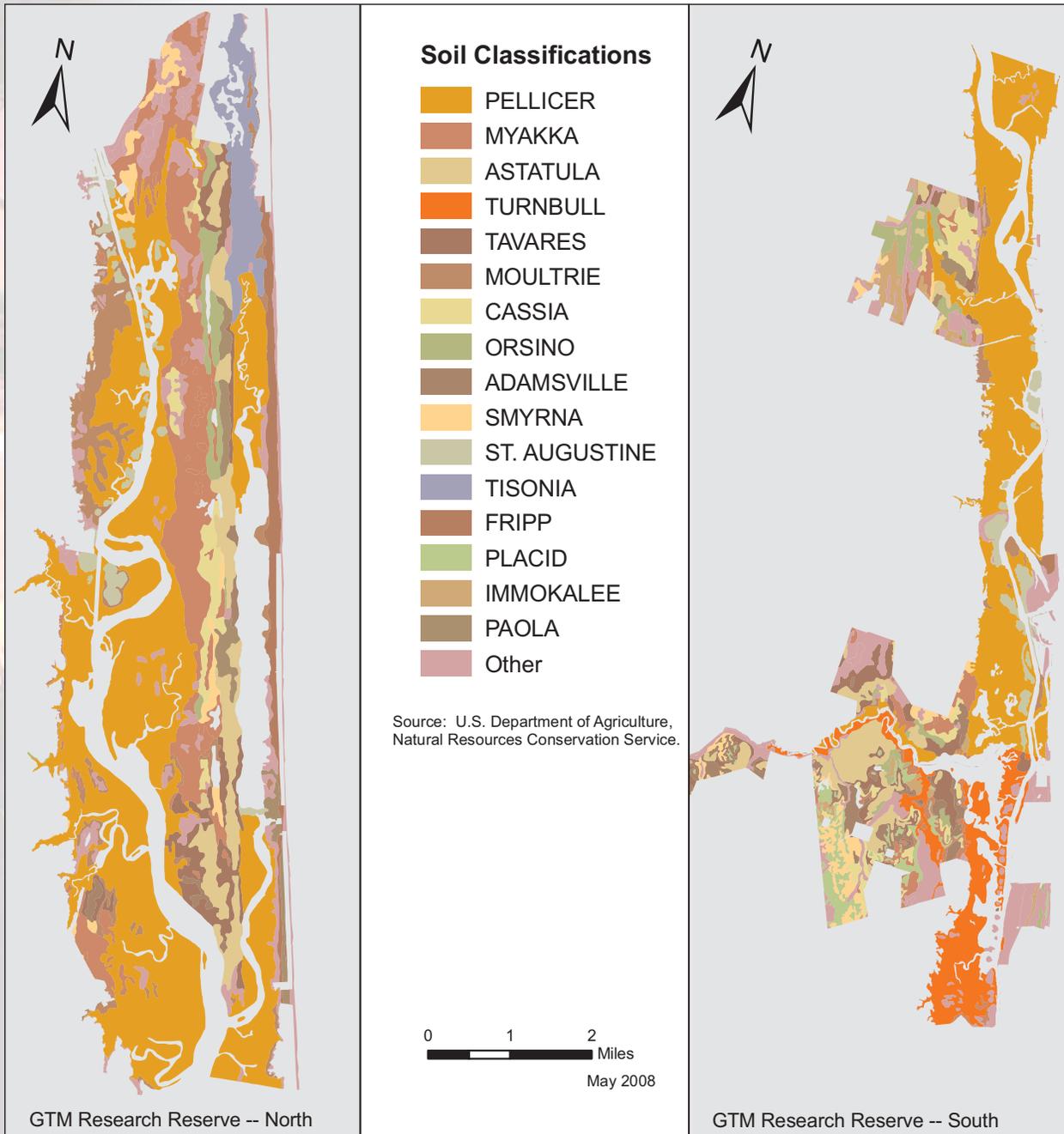
Minerals

No deposits of commercially valuable minerals have been found within the GTM Research Reserve.

Soils

There are a total of 42 soil types occurring in the boundaries of the GTM Research Reserve (Figures 11, 12). The varying depth of the water table within the soils at the GTM Research Reserve limits the land use abilities. While the region is relatively flat, the soils types are influenced by surface water flow, waves, currents and tidal forces. Relief is not pronounced, yet a few feet can mean the difference between dry, habitable, cultivable land and freshwater swamp or coastal marsh.

The soils of the uplands within the GTM Research Reserve are primarily derived from sandy marine sediments. There are five general soil map units outlined by the Soil Conservation Service (SCS). The sand ridges, coastal dunes and flatwoods areas of the Guana peninsula consist of the Astatula-Tavares soils. These soils are nearly level to sloping, excessively drained and moderately well-drained soils that



Figures 11, 12 / Soil types of the northern component (left) and watershed of the southern component (right) of the GTM Research Reserve.

are sandy throughout. They are located throughout the hammock-sand ridge and flatwoods areas west of Lake Ponte Vedra and extend to the estuarine marshes.

The Holopaw-Riviera-Pompano soils are represented on a small area along the north GRWMA boundary west of Lake Ponte Vedra. They are nearly level and poorly drained; some types are sandy to a depth of 20 to 40 inches or more and loamy below, while others are sandy throughout. They provide fair conditions for growth of grasses, legumes, herbaceous plants, hardwoods and pines.

The coastal dunes along State Road (SR) A1A are made up of the Fripp-Satellite-Paola map unit. This unit consists of soils on narrow, rolling sandy ridges interspersed with narrow swales. These soils are excessively drained sandy soils in the primary and secondary dunes and somewhat poorly drained in the swales

The Riviera-Holopaw-Winder association is found on a small portion of the GRWMA area in the northwest section bordering the AIWW. These soils are nearly level and poorly drained; some are sandy to a depth of 20 to 40 inches or more and loamy below, while others are sandy to a depth of fewer than 20 inches and loamy below. They are considered “fair” producers of open land, woodland and wetland wildlife habitat and migratory bird species utilize these areas extensively.

The Pellicer-Tisonia soils are derived from the deposition of estuarine clay sediment and organic detritus, and are found along the boundary of the Tolomato River and the AIWW (i.e., estuarine tidal marshes). They are nearly level, very poorly drained soils subject to frequent tidal flooding; some are loamy, while others are organic, underlain by clays. These soils are rated as fair producers of wetland wildlife habitat. Resident and migratory bird species utilize these wetlands extensively

The GTM Research Reserve’s beaches consist of quartz sand, shells, shell fragments, and pebbles derived from exposures of the Anastasia Formation (Tanner, 1960). This formation consists of a sandy coquina held together by calcareous cement, and obtained its name from Anastasia Island opposite St. Augustine (Cooke, 1945).

Throughout the GTM Research Reserve, soil erosion is most evident along the AIWW and the GTM Research Reserve’s ocean shoreline. Hydrodynamic and sediment transport models are needed to understand these processes and work toward sustainable solutions. In addition, the management of Lake Ponte Vedra within the GRWMA must be studied to understand the potential impact on nearby soil grain size, geochemistry, hydrology and deposition rates. The GTM Research Reserve’s education and stewardship programs will be guided by this information.

4.2.8 / Hydrology

Surface Water

The GTM Research Reserve is located in the Upper East Coast Drainage Basin (part of the Florida East Coast Basin) which covers 467,196 acres. The basin has been further divided into two major drainage sub-basins: the Tolomato River (53,802 acres) and, the Matanzas River (167,599 acres) drainage basins. The natural hydrodynamics of this system has been altered by water control structures, such as the AIWW which runs through it, dikes, inland wells, drainage ditches and a dam placed across the headwaters of the Guana River Estuary.

The Tolomato, Guana and Matanzas River estuaries form a system of “bar-bounded” estuaries that extend south from Jacksonville in Duval County to below Marineland in Flagler County behind the barrier island system. The Guana River estuary runs parallel to the Tolomato River estuary on the seaward side, with the two lagoons joining just north of the St. Augustine Inlet. Oceanic exchange occurs through the St. Johns River Inlet, a major navigational channel to the north, and the St. Augustine Inlet to the South. The Matanzas River estuary extends approximately 20 miles south from the St. Augustine Inlet to about eight miles south of the Matanzas Inlet. These tidal inlets form the oceanic exchange for the estuarine ecosystem. The St. Augustine Inlet has been stabilized with north and south jetties and is the major entrance to the AIWW which runs through the Matanzas estuary. Matanzas Inlet is one of the last “natural” inlets on Florida’s east coast. It has no dredged channel and has limited armoring along its southern shoreline. The Matanzas inlet is characterized by a transitory offshore bar and inner shoal with high tidal currents. This inlet system is ideally suited to serve as a comparison site for other more altered inlets to examine physical and biological processes such as sediment transport, species migration, and larval recruitment.

Surface waters within the GRMAP were designated as “Outstanding Florida Waters (OFW) on May 14, 1986. Because of their natural attributes, these waters are assigned additional protection through the DEP. The northern extent of the GTM Research Reserve consists of the GRMAP that encompasses the Atlantic Ocean, estuarine (tidal) waters of the Tolomato and Guana River, interior impoundments, marshes,

swamps and five artesian wells (Figure 13). Surface waters within the GRMAP are further classified as Class III and Class II. Class III waters are designated for recreation and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Class II waters are designated for shellfish propagation or harvesting.

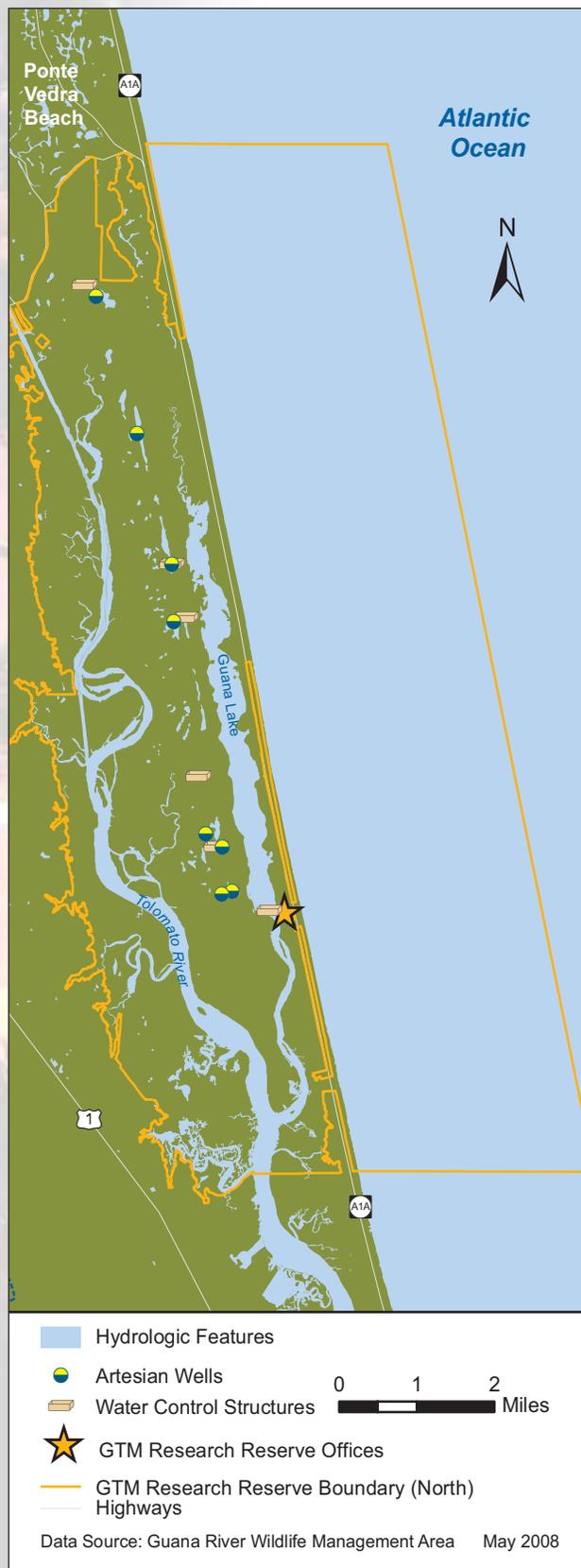


Figure 13 / Hydrology of the northern component of the GTM Research Reserve.

The southern component of the GTM Research Reserve is comprised of Pellicer Creek, Moses Creek, and the Matanzas River (Figure 14). The Pellicer Creek was designated as an “Outstanding Florida Water” (OFW), on March 1, 1979. National, state and county conservation areas surround Pellicer Creek making it one of the last undisturbed tidal marsh creek systems along the east coast of Florida. Moses Creek Conservation Area (2,173 acres) provides water quality protection to Moses Creek, the Matanzas River, and associated tidal marshes. Both water bodies are designated Class II shellfish waters by DEP and Moses Creek is one of a few undisturbed tidal creeks within the Northern Coastal Basin. In addition, Pellicer Creek Conservation Area, Princess Place Preserve, Matanzas State Forest, Fort Matanzas National Monument, The River to Sea Preserve, Washington Oaks Gardens State Park and Faver Dykes State Park provide over 15,000 acres of watershed buffer protection to the aquatic resources of the GTM Research Reserve.

Consolidating research and monitoring information from a variety of local, state and national programs is needed to produce a comprehensive watershed plan for sustainable protection of the water quality and coastal habitats of the GTM Research Reserve. The Research Reserve designation facilitates the coordination of efforts to build consensus among local, state and federal partners to implement a science-based approach to prioritize land acquisition, conservation, and restoration efforts and to identify the research, stewardship and educational programming needed to support this planning process.

Groundwater

Two aquifers are found in the region of the GTM Research Reserve (Hyde 1965). The shallow aquifer, which is non-artesian, consists primarily of Pleistocene and more recent deposits of sand and shell, but in some areas it extends down to Miocene or Pliocene deposits. This shallow aquifer recharges mainly from local rainfall.

The Floridan aquifer along the east coast is highly mineralized and is thus a less used water source in this area. Recharge to the Floridan aquifer in the area is minimal (Fernald and Patton 1984). The top of the Floridan aquifer consists of the Ocala group (Eocene epoch, 40-28 MYA). The Floridan Aquifer System is a layer of carbonate rock (e.g., limestone) that lies under most of the state of Florida and spreads

throughout the southeast (generally referred to as the “principle artesian aquifer” in Georgia, Alabama and South Carolina) (Miller, 1986). Being porous, this rock holds tremendous amounts of groundwater that has seeped from the surface over millennia.

In the GTM Research Reserve, the depth of the top of the Floridan aquifer is shallowest in the south (175 ft., PCAP) and gradually deepens towards the north (350 ft., GRMAP) (Scott and Hajishafie, 1980). The aquifer has a thickness of approximately 2,000 feet throughout the GTM Research Reserve (Miller, 1986). There is a submarine spring off the coast of Crescent Beach, just outside of PCAP that originates from this aquifer (Kinnaman, 2006). The influence of anthropogenic water diversions from aquifers for drinking water, irrigation and lake management on the GTM Research Reserve’s natural resources requires further study.

Dependence on aquifers for regional drinking water supplies is not sustainable based on current water supply projections. Alternative sources of water including ocean desalinization and surface water will require careful planning to ensure coastal resources are protected.

4.2.9 | Climate

The climate of northeast Florida is classified as sub-tropical marine, characterized by long, warm, humid summers and mild winters. Average annual precipitation is about 55 inches, with approximately 56 percent occurring from June through mid-October as afternoon and evening thundershowers. Relative humidity ranges from 40 to 50 percent in the afternoon to 90 or 95 percent in the early morning. Temperatures are moderated by close proximity to the ocean. Summer afternoon temperatures regularly reach 90°F or higher and nighttime temperatures drop to the low 70s. Average winter temperatures range from morning lows in the 30s to afternoon highs in the 70s. Prevailing winds are easterly, but northwest or southwest winds are common. Summer westerly winds can last for several days, particularly during the early morning hours.

Storm events at GTM Research Reserve include thunderstorms and hurricanes. With the exception of the September 9, 1964 landfall of category 2 hurricane Dora in St. Augustine, the areas now comprising the GTM Research Reserve have not experienced a hurricane’s eye wall landfall (Winsberg, 2003). Storms are often the cause of major shoreline changes, exacerbating the impact of other factors, such as sea level rise, inlet management, beach renourishment and channel dredging, on natural sediment dynamics (Michener 1997). The influence of global warming on sea level rise and the GTM Research Reserve’s habitat and species composition will need to be monitored closely to guide future long-term management strategies.

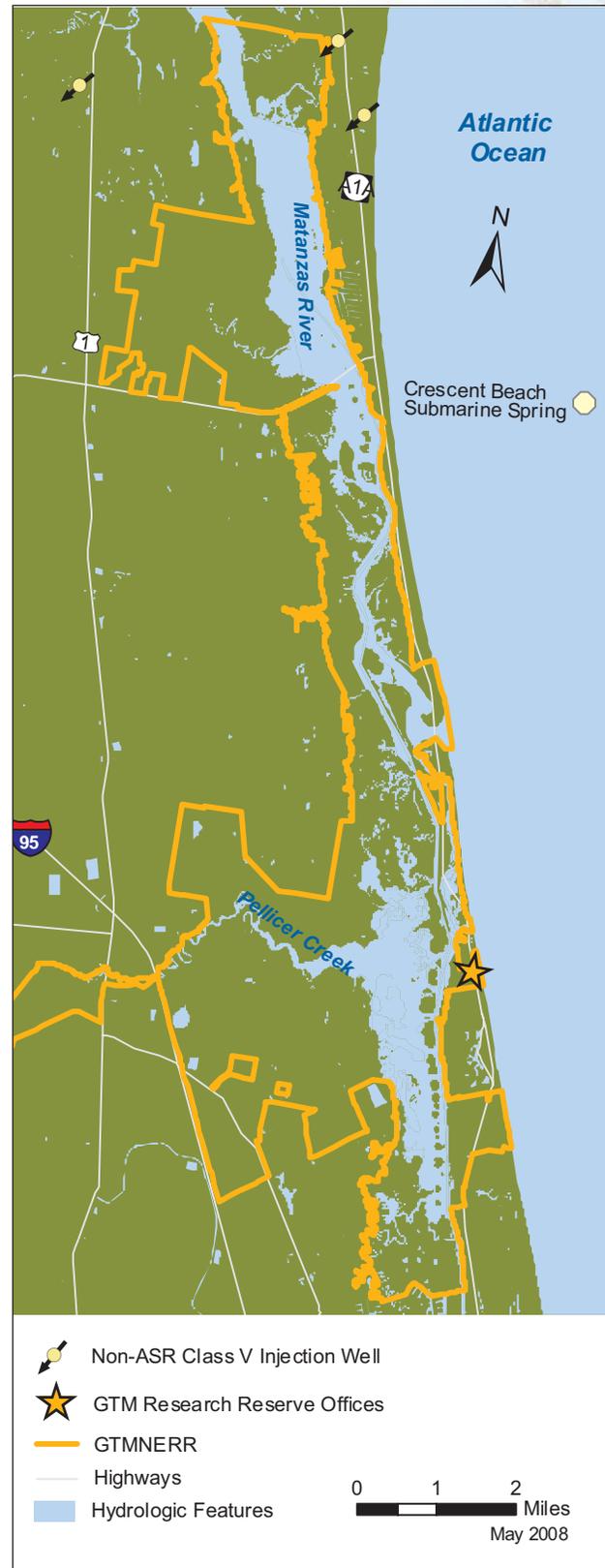


Figure 14 | Hydrology of the southern component of the GTM Research Reserve.

4.2.10 / Natural Communities

The natural community classification system used in the text of this plan was developed by the Florida Natural Areas Inventory (FNAI) and the DEP. In order to achieve consistency with NOAA/NERRS classification standards the habitat map provided in this plan is based on the Coastal Change and Analysis Program (C-CAP) scheme (Figure 15). C-CAP is a nationally standardized database of land cover and land change information, developed using remotely sensed imagery, for the coastal regions of the U.S. C-CAP products inventory coastal intertidal areas, wetlands, and adjacent uplands with the goal of monitoring these habitats by updating the land cover maps every five years. The development of standardized, regional land cover information enables managers to coordinate the planning of shared resources, facilitating an ecosystem approach to environmental issues that transcends local and state regulatory boundaries. A C-CAP/FNAI crosswalk table is provided to explain the relationship between these two classification systems (Table 1.).

Table 1 / Coastal change analysis program (C-CAP) and the Florida natural areas inventory habitat classification crosswalk.

CCAP Classification	FNAI Classification
Mixed Forest	Upland Mixed Forest
Deciduous Forest	Upland Hardwood Forest
Evergreen Forest	Xeric Hammock
Evergreen Forest	Maritime Hammock
Evergreen Forest	Sandhill
Evergreen Forest	Mesic Flatwoods
Evergreen Forest	Scrubby Flatwood
Scrub/Shrub	Scrub
Scrub/Shrub	Coastal Strand
Scrub/Shrub	Coastal Berm
Palustrine Forested Wetland	Floodplain Swamp
Palustrine Forested Wetland	Dome Swamp
Palustrine Scrub/Shrub Wetland	Floodplain Swamp
Palustrine Emergent Wetland	Basin Marsh
Palustrine Emergent Wetland	Coastal Interdunal Swale
Palustrine Emergent Wetland	Depression Marsh
Palustrine Emergent Wetland	Flatwoods/Prairie/Marsh Lake
Estuarine Forested Wetland	Tidal Swamp
Estuarine Scrub/Shrub Wetland	Tidal Swamp
Estuarine Emergent Wetland	Tidal Marsh
Unconsolidated Shore	Marine Unconsolidated Substrate
Unconsolidated Shore	Mollusk Reef
Unconsolidated Shore	Estuarine Unconsolidated Substrate
Unconsolidated Shore	Marine Consolidated Substrate
Barren Land	Shell Mound
Barren Land	Beach Dune
Water	Open Water
Water	Blackwater Stream
High Intensity Developed	Ruderal
Medium Intensity Developed	Ruderal
Low Intensity Developed	Ruderal
Developed Open Space	Ruderal
Cultivated	Ruderal
Pasture/Hay	Ruderal
Grassland	Ruderal

The community types are defined by a variety of factors, such as vegetation structure and composition, hydrology, fire regime, topography and soil type. The community types are named for the most characteristic biological or physical feature (FNAI and DEP, 1990). Since boundaries between habitats tend to be more gradual than those typically defined in habitat maps all acreage estimates are approximate.

The GTM Research Reserve contains twenty-three distinct FNAI natural communities in addition to ruderal areas. FNAI status and rankings for these habitats and specific acreages can be found in Appendix A. Specific natural communities and management recommendations are provided in Chapter six and Appendices A 7 and A 9. Temporally replicated species inventory and habitat mapping to support change detection are essential needs for managing these ecosystems. Ultimately, habitat suitability modeling or similar efforts should be implemented as a predictive tool to guide management decisions affecting natural biodiversity.

Sandhill - (synonyms: Longleaf Pine-Turkey Oak, Longleaf Pine-Xerophytic Oak, Longleaf Pine-Deciduous Oak, High Pine). Sandhill habitats are characterized as a forest of widely spaced pine trees with a sparse understory of deciduous oaks and a fairly dense ground cover of grasses and herbs on rolling hills of sand.

Fire is a dominant factor in the ecology of this community. Sandhills are a fire climax community, being dependent on frequent ground fires to reduce hardwood competition and to perpetuate pines and grasses. The natural fire frequency appears to be every 2 to 5 years. Without frequent fires, Sandhills may eventually succeed to Xeric Hammock. Unburned Sandhills may be dominated by turkey oak.

Scrub - (synonyms: Sand Pine Scrub, Florida Scrub, Sand Scrub, Rosemary Scrub, Oak Scrub). Scrub occurs in many forms, but is often characterized as a closed to open canopy forest of sand pines with dense clumps or vast thickets of scrub oaks and other shrubs dominating the understory.

Scrub is essentially a fire maintained community. Ground vegetation is extremely sparse and leaf fall is minimal, thus reducing the chance of frequent ground fires. As the sand pines mature, however, they retain most of their branches and build up large fuel supplies in their crowns. When a fire does occur, this fuel supply, in combination with the resinous needles and high stand density, ensures a hot, fast burning fire. Such fires allow for the regeneration of the Scrub community which might otherwise succeed to Xeric Hammock. The minerals in the vegetation are deposited on the bare sand as ashes, and the heat of the fire generally facilitates the release of pine seeds. As discerned from the life histories of the dominant plants, scrub probably burns

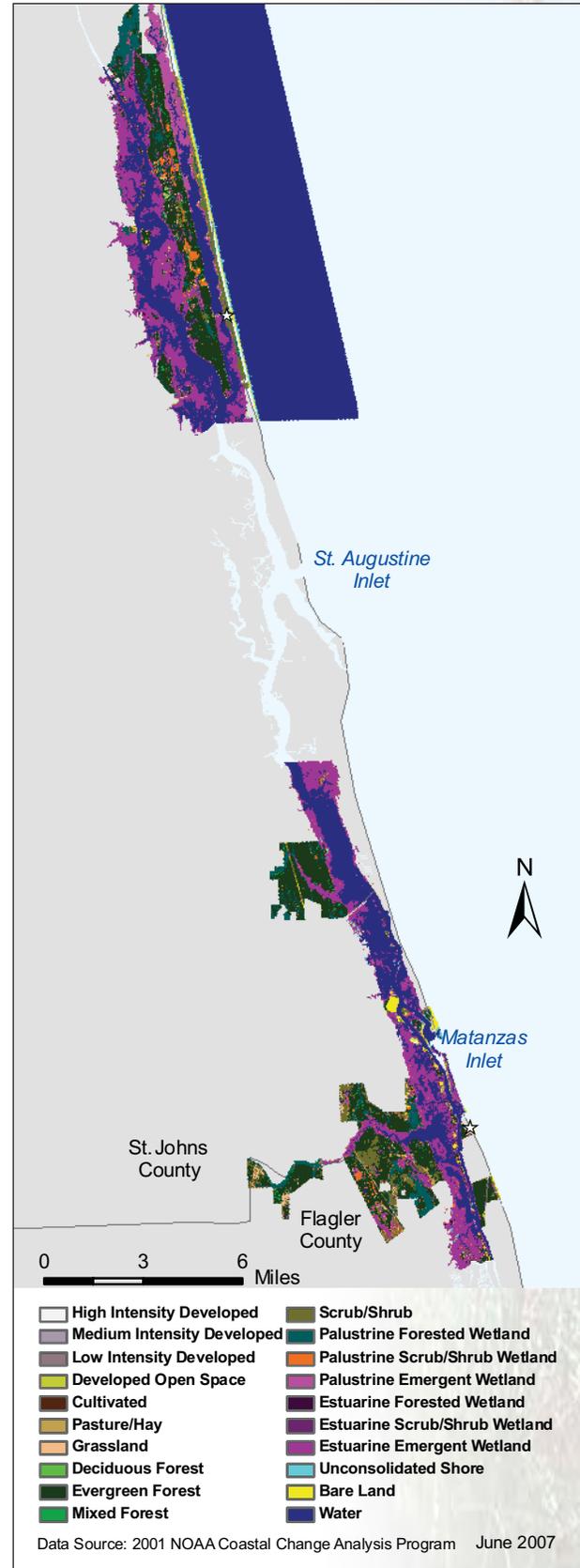


Figure 15 | Habitats of the GTM Research Reserve.



Isolated freshwater depression marshes are a critically endangered habitat and vital for recharging groundwater aquifers with clean freshwater.

catastrophically once every 20 to 80 years or longer. Scrub is also readily damaged by off-road vehicle traffic or even foot traffic, which destroys the delicate ground cover and allows the loose sand to erode. Once disturbed, ground lichens may require 50 years or more to recover.

Xeric Hammock - (synonyms: Xeric Forest, Sand Hammock, Live Oak Forest, Oak Woodland, Oak Hammock). Xeric Hammock is characterized as either a scrubby, dense, low canopy forest with little understory other than palmetto, or a multi-storied forest of tall trees with an open or closed canopy.

Xeric Hammock is an advanced successional stage of Scrub or Sandhill. The variation in vegetation structure is predominantly due to the original community from which it developed. In all cases, however, the soils consist primarily of deep, well-drained sands that were derived from old dune systems. The sparsity of herbs and the relatively incombustible oak litter preclude most fires from invading Xeric Hammock. When fire does occur, it is nearly always catastrophic and may revert Xeric Hammock into another community type. Xeric Hammock only develops on sites that have been protected from fire for 30 or more years.

Beach Dune - (synonyms: Sand Dunes, Pioneer Zone, Upper Beach, Sea Oats Zone, Coastal Strand). Beach Dune is characterized as a wind-deposited, foredune and wave-deposited upper beach that are sparsely to densely vegetated with pioneer species, especially sea oats.

Plants of the Beach Dunes are extremely vulnerable to human impacts particularly soil compaction. A footpath or off-road vehicle trail over the beach dunes damages the vegetation, increasing erosion by wind and water. Once begun, gaps continually widen unless they are revegetated and stabilized. The sand from the gap moves inland, and rapidly buries vegetation, destabilizing the beach dunes and disturbing adjacent communities. Gaps also increase erosion caused by storms. Because of their vulnerability, Beach Dunes require protection from trampling (i.e., boardwalks for beach access) and off-road vehicles.

Coastal Berm - (synonyms: Shell Ridge, Coastal Levee, Coastal Forest, Buttonwood Embankment, Mangrove Hammock). Coastal Berm applies to a variety of plant associations that develop on ridges of storm deposited sand, shells, and debris. These associations include dense thickets of large shrubs and small trees, hammocks, or sparse shrubby vegetation with spiny xerophytic plants. Coastal Berm habitats are similar to Coastal Strand habitats in their physiography and resilience.

Coastal Strand - (synonyms: Shrub Zone, Maritime Thicket, Coastal Scrub). Coastal Strand is characterized as stabilized, wind-deposited coastal dunes that are vegetated with a dense thicket of salt-tolerant shrubs.

Coastal Strand dunes are generally quite stable but are susceptible to severe damage if the vegetation is disturbed. Shrubs in the Coastal Strand are frequently dwarfed and pruned as a result of the salt spray-laden winds that kill twigs on the seaward side, producing a smooth, dense upward-slanting canopy resembling a sheared hedge. Coastal Strand is actually an ecotonal community that generally lies between Beach Dune and Maritime hammock. It may also grade into Scrub, and it often shares many of the same species that occur in Coastal Berm. Fire may reduce succession towards Maritime Hammock. However, maritime landuse alone will often suffice to inhibit succession to forest.

Coastal Strand is one of the most rapidly disappearing community types in Florida. It is most extensive along the Atlantic Coast where, being elevated and next to the coast, it is prime resort or residential property. Coastal Strand originally occurred as a nearly continuous band along the Atlantic shorelines. Now it occurs largely as broken and isolated small stretches. Along with other coastal communities, Coastal Strand protects inland communities from the severe effects of storms.

Coastal Interdunal Swale - Habitats that occur where 1) dune and swale topography has developed within the past 5000 years, 2) a lens of groundwater intersects the bottom of the swales, and 3) extensive flooding by saltwater is infrequent. Critical to the existence of this habitat is a subsurface hydraulic connection with the barrier island's water table. The water levels in the interdunal wetlands are strongly tied to local rainfall events. Consequently, the community varies from flooded to completely dry depending on rainfall, as well as area and elevation of the surrounding dunes.

Little in the way of active management is required other than to prevent disruption by vehicles or excessive foot traffic or disruption of natural hydrology. Fires occasionally burn through the swales but the dominant factor in this community's development and maintenance is hydrology.

Maritime Hammock - (synonyms: Coastal Hammock, Maritime Forest, Tropical Hammock). Maritime Hammock is characterized as a narrow band of hardwood forest lying just inland of the Coastal Strand community.

The generally mesic conditions and insular locations of well-developed Maritime Hammock communities inhibit natural fires, which occur no more frequently than once every 26 to 100 years. In mature Maritime Hammock, fire may alter the original appearance, obscuring former beach ridge vegetation patterns and creating a diversity of plant sub-associations. Nutrient recycling is generally accomplished by biological based processes instead of by fire.

Maritime Hammock is the terminal stage of succession in coastal areas. Maritime Hammock is prime resort and residential property because of its relatively protected location along the coast. Although it originally occurred in virtually continuous bands with Coastal Strand, Maritime Hammock is now dissected into fragments by development and is rapidly disappearing. Maritime Hammock is reasonably resilient so long as the canopy remains intact and the landform stable.

Shell Mound - (synonyms: Midden, Indian Mound, Tropical Hammock, Maritime Hammock, Coastal Hammock). Shell Mound is unusual among the biological communities in that it is largely a result of the activities of Native Americans, instead of natural physical factors. Shell Mound is generally characterized as an elevated mound of mollusk shells and aboriginal refuse on which a hardwood, closed-canopy forest develops.

Being constructed of archaeological remains, Shell Mounds are vulnerable to damage by artifact-seekers and archaeological excavations. Sites where visitor use is not monitored should not be publicized and public access should be discouraged. Archaeological investigations should be conducted with care to protect important unique botanical features.

Mesic Flatwoods - (synonyms: Pine Flatwoods, Pine Savannahs, Pine Barrens). Mesic Flatwoods are characterized as an open canopy forest of widely spaced pine trees with little or no understory but a dense ground cover of herbs and shrubs.

Mesic Flatwoods occur on relatively flat, moderately to poorly drained terrain. The soils typically consist of 1-3 feet of acidic sands generally overlying an organic hardpan or clayey subsoil. The hardpan substantially reduces the percolation of water below and above its surface. During the rainy seasons, water frequently stands on the hardpan's surface and briefly inundates much of the flatwoods; while during the drier seasons, ground water is unobtainable for many plants whose roots fail to penetrate the hardpan. Thus, many plants are under the stress of water saturation during the wet seasons and under the stress of dehydration during the dry seasons.

Another important physical factor in Mesic Flatwoods is fire, which probably naturally occurred every 1 to 8 years. Nearly all plants and animals inhabiting this community are adapted to periodic fires; several species depend on fire for their continued existence. Without relatively frequent fires, Mesic Flatwoods succeed into hardwood-dominated forests whose closed canopy can essentially eliminate the ground cover herbs and shrubs. Additionally, the dense layer of litter that accumulates on unburned sites can eliminate the reproduction of pines which require a mineral soil substrate for proper germination. Thus, the integrity of the Mesic Flatwoods community is dependent on periodic fires. However, fires that are too frequent or too hot would eliminate pine recruitment and eventually transform Mesic Flatwoods into Dry Prairie.

Scrubby Flatwood - (synonyms: Xeric Flatwoods, Dry Flatwoods). Scrubby Flatwoods are characterized as an open canopy forest of widely scattered pine trees with a sparse shrubby understory and numerous areas of barren white sand. The vegetation is a combination of Scrub and Mesic Flatwoods species; Scrubby Flatwoods often occupy broad transitions or ecotones between these communities.

Scrubby Flatwoods generally occur intermingled with Mesic Flatwoods along slightly elevated relictual sandbars and dunes. The white sandy soil is several feet deep and drains rapidly. However, the water table is unlikely to be very deep. Scrubby Flatwoods normally do not flood even under extremely wet conditions. The temperature and humidity of air and soil in Scrubby Flatwoods fluctuate substantially more than in most other communities because the scattered overstory, sparse understory, and barren sands of Scrubby Flatwoods do not buffer daily and seasonal changes very well.

Although the elevated, deeper sandy soils of scrubby flatwoods engender a drier environment than the surrounding mesic flatwoods, the general sparsity of ground vegetation and the greater proportion of relatively incombustible scrub-oak leaf litter reduce the frequency of naturally occurring fires. Only after a long absence of fire and during periods of drought does the leaf litter become sufficiently combustible and concentrated enough to support an ecological burn. Several species of plants in Scrubby Flatwoods are typical scrub plants which endure only when long intervals between fires occur. Thus, a periodicity of approximately 8 to 25 years between fires appears to be natural for this community.

Upland Mixed Forest - Upland Hardwood Forest and Upland Mixed Forest - (synonyms: Mesic Hammock, Climax Hardwoods, Upland Hardwoods, Beech-Magnolia Climax, Oak-Magnolia Climax, Pine-Oak Hickory Association, Southern Mixed Hardwoods, Clay Hills Hammocks, Piedmont Forest).

Upland Mixed Forests are characterized as well-developed, closed canopy forests of upland hardwoods on rolling hills.

Soils of Upland Mixed Forests are generally sandy-clays or clayey sands with substantial organic and often calcareous components. The topography and clayey soils increase surface water runoff, although this is counterbalanced by the moisture retention properties of clays and by the often thick layer of leaf mulch which helps conserve soil moisture and create mesic conditions. Furthermore, the canopy is densely closed, except during winter in areas where deciduous trees predominate. Thus, air movement and light penetration are generally low, making the humidity high and relatively constant. Because of these conditions Upland Mixed Forests rarely burn.

Upland Mixed Forests are climax communities for their respective geographic locations. They are often associated with and grade into Upland Pine Forest, Slope Forest or Xeric Hammock. Occasionally, Upland Mixed Forests may also grade into Maritime Hammock or Prairie Hammock. During early stages of succession, Upland Mixed Forest may be difficult to distinguish from Upland Pine Forests that have not been burned for several years. Disturbed sites may require hundreds of years to reach full development with species compositions representative of climax conditions.

Silvicultural, agricultural, industrial, and residential developments have already eliminated the vast bulk of these communities. These activities are continuing at an accelerated pace in many areas, such that the few remnant mature examples are in urgent need of protection and proper management.

Depression Marsh - synonyms: Isolated Wetland, Flatwoods Pond, St. John's Wort Pond, Pineland Depression, Ephemeral Pond, Seasonal Marsh). Depression Marsh is characterized as a shallow, usually rounded depression in sand substrate with herbaceous vegetation often in concentric bands.

Depression Marshes occur where sand has slumped and created a conical depression subsequently filled by direct rain fall, runoff, or seepage from surrounding uplands. The substrate is usually acid sand with deepening peat toward the center. Some depressions may have developed or be maintained by a subsurface hardpan. Hydrological conditions vary, with most Depression Marshes drying in most years. Hydroperiods range widely from as few as 50 days or less to more than 200 days per year.



Research and monitoring is essential for guiding, prioritizing, and assessing GTM Research Reserve's management strategies.

Fire is important to maintaining this community type by restricting invasion of shrubs and trees and the formation of peat. Fire frequency is often greatest around the periphery of the marsh and least toward the center. Severe peat fire can lower the ground surface and create a pond at the center of the marsh. Hydrologic conditions and species composition must be monitored and used to assess ecological targets to guide fire management.

Dome Swamp - (synonyms: Isolated Wetland Cypress Dome, Cypress Pond, Gum Pond, Bayhead, Cypress Gall, Pine Barrens Pond). Dome Swamps are characterized as shallow, forested, usually circular depressions that generally present a domed profile because smaller trees grow in the shallower waters at the outer edge, while bigger trees grow in the deeper water in the interior. Pond cypress, swamp tupelo, and slash pine are common plants.

Dome Swamps typically develop in sandy flatwoods areas where sand has slumped creating a conical depression. Soils are composed of peat, which becomes thickest toward the center of the dome, and are generally underlain with acidic sands and then limestone, although other subsoils may also occur. Some domes have a clay lens that helps retain water levels.

Dome Swamps often derive much of their water through runoff from surrounding uplands, but they may also be connected with underground channels, in which case subterranean flows would dominate the hydrological regime. Dome Swamps generally function as reservoirs that recharge the aquifer. The normal hydroperiod for Dome Swamps is 200 to 300 days per year with water being deepest and remaining longest near the center of the dome.

Fire is essential for the maintenance of a cypress dome community. Without periodic fires, hardwood invasion and peat accumulation would convert the dome to Bottomland Forest or Bog. Dome Swamps dominated by bays are close to this transition. Fire frequency is greatest at the dryer periphery of the dome and least in the interior where long hydroperiods and deep peat maintain high moisture levels for most of the year. The normal fire cycle might be as short as 3 to 5 years along the outer edge and as long as 100 to 150 years towards the center. The profile of a Dome Swamp (i.e., smaller trees at the periphery and largest trees near the center) is largely attributable to this fire regime. The shorter hydroperiods along the periphery permit fires to burn into the edge more often, occasionally killing the outer trees. Cypress is very tolerant of light surface fires, but muck fires burning into the peat can kill them, lower the ground surface, and transform the dome into a pond.

Floodplain Swamp - (synonyms: River Swamp, Bottomland Hardwoods, Seasonally Flooded Basins or Flats, Oak-Gum-Cypress, Cypress-Tupelo, Slough, Oxbow, Back Swamp). Floodplain Swamps occur on flooded soils along stream channels and in low spots and oxbows within river floodplains.

Soils of Floodplain Swamps are highly variable mixtures of sand, organic, and alluvial materials, although some sites, especially within sloughs or on smaller streams, may have considerable peat accumulation. Floodplain Swamps are flooded for most of the year, with sites along channels inundated by aerobic flowing water while those of sloughs and backswamps are naturally flooded with anaerobic water for extensive periods of time. Soils and hydroperiods determine species composition and community structure. Seasonal and often prolonged inundations restrict the growth of most shrubs and herbs, leaving most of the ground surface open or thinly mantled with leaf litter. Floods redistribute detritus to other portions of the floodplain or into the main river channel. This rich organic debris is essential to the functional integrity of downriver ecosystems such as estuaries. These swamps are usually too wet to support fire.

Alteration of the hydroperiod by impoundments, canals or river diversions and the disruption of floodplain communities by forestry residential development or agriculture have consequences to the entire river and bay system. Many plant and animal species, both onsite and down river, depend upon the presence and natural fluctuations of these swamps for survival and reproduction.

Flatwoods/Prairie/Marsh Lake - (synonyms: Flatwoods Pond, Ephemeral Pond, Grass Pond, St. John's Wort Pond, Freshwater Lake, Pineland Depression, Swale, Prairie Pond). The distinctions between these communities, and from Depression Marsh, are often quite subtle, because of their successional interrelationships.

Water for this habitat is derived mostly from runoff from the immediately surrounding uplands. This habitat functions as aquifer recharge areas by acting as reservoirs. Water generally remains throughout the year in a Flatwoods/Prairie Lake or a Marsh Lake, although water levels may fluctuate substantially. Alterations in natural hydrologic conditions and water quality are the primary disturbances to this habitat.

Blackwater Stream - (synonyms: Blackwater River, Blackwater Creek). Blackwater Streams are characterized as perennial or intermittent seasonal watercourses originating deep in sandy lowlands where extensive wetlands with organic soils function as reservoirs, collecting rainfall and discharging it slowly to the stream. The tea-colored waters of Blackwater Streams are laden with tannins, particulates, and dissolved organic matter and iron derived from drainage through swamps and marshes.

Blackwater Streams are the most widely distributed and numerous Riverine systems in the southeast Coastal Plain. Very few, however, have escaped major disturbances and alteration. Clearcutting adjacent forested lands and disruptions to natural hydrology are two of the more devastating alterations for this community. Additionally, limited buffering of Blackwater Streams from development intensifies the detrimental impacts of agricultural, residential and industrial polluted runoff.

Estuarine Tidal Marsh - (synonyms: Saltmarsh, Brackish Marsh, Coastal Wetlands, Coastal Marshes, Tidal Wetlands). Marine and Estuarine Tidal Marshes are Floral Based Natural Communities generally characterized as expanses of grasses, rushes and sedges along coastlines of low wave energy and river mouths.

Adverse impacts of urban development of Tidal Marshes include degradation of water quality, filling of marshes, increased erosion, and other alterations such as bulkheading, dock construction and beach renourishment. Offshore and watershed based pollution from oil spills, litter and polluted storm-water runoff can also have detrimental impacts to Estuarine Tidal Marsh habitats.

Estuarine Unconsolidated Substrate - (synonyms: Beach, Shore, Sand Bottom, Shell Bottom, Sand Bar, Mud Flat, Tidal Flat, Soft Bottom, Coralgall Substrate, Marl, Gravel, Pebble, Calcareous Clay). The GTM Research Reserve's estuarine unconsolidated substrate supports salt marshes that are rich in estuarine invertebrates. While these areas may seem relatively barren, the densities of infaunal organisms in subtidal zones can reach the tens of thousands per meter square, making these areas important feeding grounds for many bottom feeding fish, such as redfish, flounder, spot, and sheepshead.

This habitat is vulnerable to compaction associated with vehicular traffic on beaches and disturbances from dredge and fill activities and low dissolved oxygen levels, all of which can cause infaunal organisms to be destroyed or to migrate out of the area. Generally these areas are easily recolonized either by the same organisms or a series of organisms which eventually results in the community returning to its original state once the disturbance has ceased. In extreme examples, significant alterations of elevation or sediment grain size distribution can also cause long-term impacts to this habitat.

This habitat is also susceptible to the accumulation of toxic levels of heavy metals, oils, and pesticides associated with fine-grained sediments and organic matter. Significant amounts of these compounds



Archaeological resources provide valuable insight into past cultures and enhance visitor experiences at the GTM Research Reserve.

in the sediments will harm the infaunal organisms, thereby eliminating or contaminating a food source for certain fishes, birds, and other organisms. Such problems occur in some of the major cities, in areas where there is heavy industrial development, near sewage treatment plant outfalls, and along major shipping channels where oil spills are more likely to occur. Improperly treated stormwater runoff from residential areas is becoming a progressively more important source of pollutants as human population densities increase along the coast.

Estuarine Mollusk Reef - (synonyms: Oyster Bar, Oyster Reef, Oyster Bed, Oyster Rock, Oyster Grounds, Mussel Reef, Worm Shell Reef, Vermetid Reef). Marine and Estuarine Mollusk Reefs are Faunal Based Natural Communities typically characterized as expansive concentrations of sessile mollusks occurring in intertidal and subtidal zones.

The most common type of Mollusk Reef in the GTM Research Reserve, oyster mollusk reefs, occur in water salinities from just above fresh water to just below full strength sea water, but develop most frequently in estuarine water with salinities between 15 and 30 ppt. Their absence in marine water is largely attributed to the many predators, parasites, and diseases of oysters that occur in higher salinities. Prolonged exposure to low salinities (less than 2 ppt.) is also known to be responsible for massive mortality of oyster reefs. Thus, significant increases or decreases in salinity levels through natural or unnatural alterations of freshwater inflow can be detrimental to oyster Mollusk Reef communities. The condition of this community provides a valuable performance indicator for restoring natural freshwater inflows to altered estuarine habitats.

Mollusk Reefs occupy a unique position among estuarine invertebrates and have been an important human food source since prehistoric times. They present a dynamic community of estuarine ecology, forming refugia, nursery grounds, and feeding areas for a myriad of other estuarine organisms.

The major threats to mollusk reefs continue to be pollution and substrate degradation due, in large part, to upland development. Mollusks are filter feeders, filtering up to 100 gallons of water a day. In addition to filtering food, they also filter and accumulate toxins from polluted waters. Sources of these pollutants can be from considerably distant areas, but are often more damaging when nearby. Substrate degradation occurs when silts, sludge and dredge spoils cover and bury the Mollusk Reefs. Declining oyster and other Mollusk Reef populations can be expected in coastal waters that are being dredged or are receiving



Upland habitats, like hardwood hammock forests, serve as efficient buffers that filter pollutants from stormwater and also provide important wildlife habitat for migrating songbirds.

chemicals mixed with rainwater flowing off the land, or from drainage of untreated residential or industrial sewage systems.

Marine Consolidated Substrate - (synonyms: Hard Bottom, Rock Bottom, Limerock Bottom, Coquina Bottom, Relic Reef). This community is represented by an outcrop of coquina rock called the Anastasia Formation that is supratidal to subtidal. Zonation of the plants and animals is driven by the tides, with the supratidal zone labeled the black zone, followed by the yellow zone, the green zone, and the red zone. Colors are the result of the dominant alga. Well over 100 species of plants and animals have been identified from this formation in Washington Oaks State Garden. The resilience of this habitat to anthropogenic disturbance requires further study.

Marine Unconsolidated Substrate - (synonyms: Beach, Shore, Sand Bottom, Shell Bottom, Sand Bar, Mud Flat, Tidal Flat, Soft Bottom, Coralgal Substrate, Marl, Gravel, Pebble, Calcareous Clay). The portion of the beach, which lies seaward of the beach dune community, is categorized as marine unconsolidated substrate. This community is largely devoid of plant species. Marine unconsolidated substrate is critical habitat for shorebirds (for breeding, resting, and feeding), and nesting/hatching sea turtles.

Marine Unconsolidated Substrates are also sensitive to disturbances from coastal erosion, dredging activities and low dissolved oxygen levels. Generally these areas are also easily recolonized once the disturbance has ceased. Toxic levels of heavy metals, oils, and pesticides can accumulate within Unconsolidated Marine Substrates particularly smaller grain sized substrates.

Open Water - This is a non-FNAI categorized marine habitat consisting of pelagic water areas of marine habitat within state waters that extend three nautical miles off of the Florida east coast. The subtidal oceanic portion of the Guana River Marsh Aquatic Preserve is an example of this habitat type. This location has been identified as an important habitat for the endangered North Atlantic right whale (*Eubalaena glacialis*).

Ruderal - Natural ground cover severely disturbed by human influence. Developed land within the GTM Research Reserve consists of the maintenance and office facilities, parking lots, trails, roads, nature

centers, restrooms and other structures found within the boundary. To minimize the environmental impact of these structures careful planning is needed to limit impervious surfaces, select environmentally friendly landscaping, construction and maintenance materials and monitor the surrounding natural environment for unintentional harm.

4.2.11 / Listed Species

Listed species are those which are listed by the FNAI, U.S. Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FWC) and the Florida Department of Agriculture and Consumer Services (FDACS) as endangered, threatened or of special concern. Specific management strategies will be addressed later in this plan. All management actions will be in compliance with the recovery plans for these species. Eight plant and forty-eight animal species inhabiting the GTM Research Reserve have been listed as endangered, threatened or of special concern (Appendix A 6).

The GTM Research Reserve contains approximately 13 miles of beachfront property including nearly five miles of virtually undeveloped Atlantic Ocean beach dune habitat. This unique habitat has some of the highest dunes in Florida. Beach dunes in Northeast Florida are potential habitat for the endangered Anastasia Island beach mouse (*Peromyscus polionotus phasma*). Monitoring of this habitat for these species has been a priority for the GTM Research Reserve's resource management program. The Anastasia Island beach mouse was reintroduced to the GTM Research Reserve's beach dunes in 1992 as part of the recovery plan (USFWS 1993). The founder population consisted of 55 individuals. GTM Research Reserve staff continues to monitor for the presence of this species although recent catch results suggest the reintroduction was unsuccessful. Further assessment is needed to determine if prescribed fire or other compatible management techniques might restore more suitable habitat conditions for this species.

The GTM Research Reserve's beach habitats also provide sites for the threatened nesting least terns and for three listed species of sea turtles: the loggerhead (*Caretta caretta*), the leatherback (*Dermochelys coriacea*) and the green turtle (*Chelonia mydas*). Sea turtles use the sandy beach between the high tide line and the base of the dunes for nesting, with nesting occurring between May and October. The GTM Research Reserve staff monitors sea turtle nesting activity. The GTM Research Reserve's beach habitat is an active nesting beach that is part of the statewide Index Nesting Beach Survey compiled annually by the FWC. Most of the nests are deposited by loggerhead sea turtles, but nests of the endangered green and leatherback sea turtles have also been documented. Nests are marked and, after hatching, are excavated for evaluation of hatching success and hatchling emergence. Least tern nesting areas along the GTM Research Reserve's beaches are also posted to alert people using the beach of this important habitat.

West Indian manatees (*Trichechus manatus latirostris*) are occasionally observed in the Guana River and Pellicer Creek during their seasonal migrations along the AIWW. The gopher tortoise (*Gopherus polyphemus*), a keystone species and a species listed as threatened, lives in several habitats in the GTM Research Reserve. There are also several active bald eagle (*Haliaeetus leucocephalus*) nests within the GTM Research Reserve. Gopher frogs (*Rana capito*), diamondback terrapins (*Malaclemys terrapin*) and striped newts (*Notophthalmus perstriatus*) also occur within the GTM Research Reserve. In addition, the GTM Research Reserve's open-water oceanic habitat is identified as a critical calving habitat for the endangered North Atlantic right whale (*Eubalaena glacialis*).

The FWC has proposed that the wetlands of east St. Johns County be considered a Strategic Habitat Conservation Area for rare wading birds (e.g. wood stork (*Mycteria americana*), little blue heron (*Egretta caerulea*)). The Twelve Mile Swamp and Snowden Bay drainage basins (located in GRWMA as well as the uplands directly managed by the GTM Research Reserve) also constitute a Strategic Habitat Conservation Area due to their populations of Florida black bear (*Ursus americanus floridanus*), American swallow-tailed kite (*Elanoides forficatus*), eastern indigo snake (*Drymarchon corais couperi*), Bartram's ixia (*Sapingostylis coelestinum*) and rare wading birds including wood storks and little blue herons (Cox et al., 1994).

4.2.12 / Invasive Species

Invasive species, also known as exotic species, are those wild or feral plants or animals that are not native to Florida, but were introduced as a result of human-related activities. Exotic species typically have fewer natural enemies and may have a higher survival rate than do native species. They may harbor diseases or parasites that significantly affect non-resistant native species. All invasive exotic species are a threat to the integrity of the GTM Research Reserve's natural communities and are in direct conflict with its mission

to encourage sustainable conservation of natural biodiversity. The degree of threat posed by these species differs within managed areas comprising the GTM Research Reserve. Therefore, the policy of the GTM Research Reserve and its partners is to remove exotic species incompatible with each location's management goals.

Prevention is the best strategy to protect the GTM Research Reserve's natural resources from damage by invasive exotic species. Many of these species are introduced to the GTM Research Reserve by well intentioned individuals, are escaped pets, or are carried on boats or in ballast water. The threats caused by exotic species and prevention strategies must be continually included in educational materials to emphasize the severity of this issue and to promote voluntary action. In addition, stewardship and research strategies are needed to quickly identify new invasions and assess the impact to native flora and fauna. Climate change and its impact on range extension of exotic species from south Florida is an increasing topic of concern for the GTM Research Reserve.

A majority of the past focus of the GTM Research Reserve has been on terrestrial exotic species; however, estuarine, oceanic and freshwater invasive species are equally damaging. Recent invasions by Asian green mussels (*Perna viridis*) and titan acorn barnacles (*Megabalanus coccopoma*) have been documented in the GTM Research Reserve. As with many aquatic managed areas a comprehensive management strategy to quickly detect estuarine invasive species and, when feasible, to control new introductions does not exist. The GTM Research Reserve will continue to serve as a clearinghouse for science-based trends in detection and control methods for terrestrial and estuarine invasive species. Details of the GTM Research Reserve invasive and nuisance species management issues and strategies can be found in Appendix A 7.

4.2.13 / Problem/Nuisance Species

Problem species are defined as native species that cause specific management problems or concerns. Occasionally, problem species are also a listed species, such as alligators. The GTM Research Reserve and its partners will consult and coordinate with appropriate federal, state and local agencies for management of listed species that are considered a threat or problem. Raccoons (*Procyon lotor*) are problem species in the picnic grounds and refuse collection points within the GTM Research Reserve where they scavenge for food. Education of the GTM Research Reserve visitors related to the consequences of feeding wildlife will continue.

Outbreaks of mosquitoes and other biting flies are perceived as a problem by some GTM Research Reserve visitors. The marshes and freshwater wetlands can be breeding sites for mosquitoes. The GTM Research Reserve is partnering with the Anastasia Mosquito Control District to explore creating a co-funded biologist position to study the non-target impact of mosquito control techniques and to guide the development of strategies to selectively control mosquitoes in areas with high human use while minimizing damage to the GTM Research Reserve's natural biodiversity.

4.2.14 / Forest Resources

Forest resources vary within the management units that comprise the GTM Research Reserve. State agency specific information is available within each unit's Acquisition and Restoration Council (ARC) approved management plan. The most practical application of silviculture within the CAMA managed lands of the GTM Research Reserve is as a tool in achieving restoration objectives and for reducing wildfire hazards. In the best case scenario the revenue potential of timber harvest in the GTM Research Reserve is low to average (Appendix A 8).

4.2.15 / Archaeological and Historical Resources

Modern northeast Florida's appearance is the result of a long interaction of humans and nature. The region is of special interest because of the comprehensive documentary record of human settlement and landscape modifications beginning at an early date. The detailed records of the mid-sixteenth century, Native American, Spanish, French, British and American inhabitants indicate that these cultures adapted in very different ways. Burning, clear cutting, plowing, dredging, filling, ditching and drainage are all evident throughout the historical record.

The first inhabitants of northeast Florida adapted to Late Glacial conditions with a technology and settlement pattern suited to the hunting of scarce and large animals in a dry climate. Even at quite low population densities the environmental landuse of these Paleo Native Americans may have included hunting to extinction a number of large vertebrate species (Miller, 1991). Between 10,000 and 5,000 years ago, the most fundamental changes to the environment were natural in origin. As

sea level rise slowed to its pre-industrial rate, water resources, small game, and plant resources became more accessible. This condition enhanced settlement in coastal locations. By about 5,000 years ago the coastal environment of Florida had become similar to the present day situation. Native Americans living on the coast took advantage of the relatively stable and abundant seafood, an important source of protein. As human populations became more sedentary in response to stable conditions, opportunities for specialized collection and domestication of plants increased along with the duration of settlements.

There are currently 61 recorded archaeological sites within the boundaries of the area directly managed by the GTM Research Reserve (Figure 16). Known sites include a burial mound, numerous shell middens, a Spanish mission (probably La Natividad de Nuestra Senora de Tolomato), and homestead sites from the British, Second Spanish and Territorial Periods (Newman 1995).

Some of the major prehistoric and historic cultural sites in the GTM Research Reserve include:

Northern Component (Figure 16)

SJ00032 Shell Bluff Landing - This is an extensive midden site located on the west side of the Guana peninsula long the shoreline of the Tolomato River. Artifacts representing the cultures of the area from the Orange Period (ca. 2500 BC) to recent times have been found at the site. A 19th century Minorcan well, constructed of coquina blocks, was discovered at the site and dated to about the 1800-1820 period. On February 8, 1991, the Florida Register Review Board approved the nomination of Shell Bluff Landing for listing in the National Register of Historic Places.

SJ02554 Guana River Shell Ring - This large, 100 meter diameter shell ring is made up of oyster, clam, and coquina shells on the east side of the Guana peninsula adjacent to Lake Ponte Vedra (formerly part of the Guana River). Artifacts found at the site indicate a late Archaic Period (ca. 500-1000 BC) date for the ring's construction. This is the only Archaic shell ring reported to date in the state of Florida. It is considered eligible for listing in the National Register of Historic Places.

SJ02463 Guana River Site - This extensive shell midden extends over 100 meters along a ridge overlooking Lake Ponte Vedra. The midden is made up of layers of zones believed to date from the preceramic Archaic Period (prior to 2500 BC) in the lowest zone to historic European occupation, Spanish or British (ca. AD 1763-1900), in the upper zone.

SJ00004 Sanchez Mound - An earthen mound of stone celts, whetstones and human bundle burials on the Guana Peninsula. There has been no formal archaeological survey of this site.

SJ02548 Little Orange Site - A small shell midden located on the western shoreline of the Guana River. Shells, as well as fire-tempered shards (ca. 2500 BC) and a Strombus pick were collected at this site.

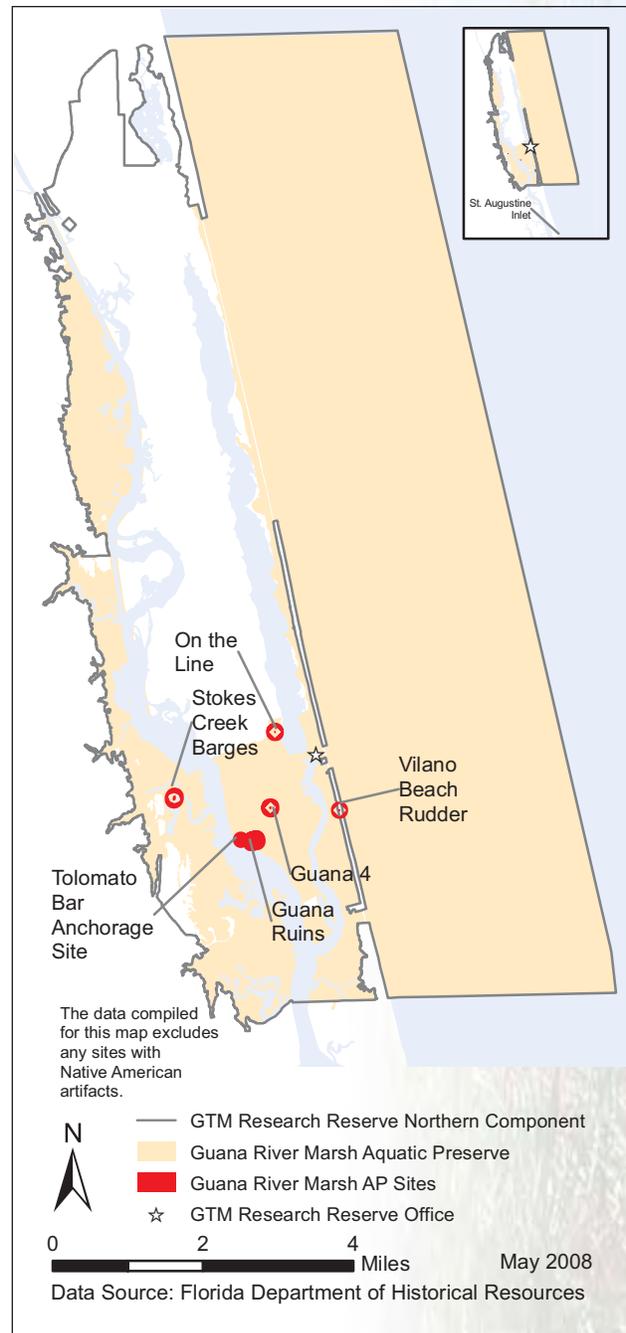


Figure 16 | Cultural resources of the GTM Research Reserve's northern component excluding sites with known native american artifacts.

Southern Component (Figure 17)

SJ00046 Summer Haven Site - A late Orange Period archaeological site. Archaeological digs at this site found tools, fiber tempered pottery, and other evidence indicating that Native Americans used water transportation and engaged in fishing in the area.

Faver-Dykes State Park has five identified sites with artifacts from the full range of cultural periods: Orange, St. Johns, Saint Augustine and Second Spanish from the Hepworth Carter Plantation site.

Washington Oaks Gardens State Park has several nineteenth and early twentieth century sites associated with the Bella Vista Plantation, as well as sites associated with the ornamental gardens dating from the late 1930s - 1950s. In addition the area has several middens in fair to good condition.

Princess Place Preserve has Florida's oldest commercial orange groves planted in the early 1800's. The land is part of the original land grant from the Spanish Government in the late 1700's; it may be the only contiguous land grant remaining from that time period. The site contains one of Florida's first in-ground pools.

SJ00044 Matanzas Inlet, at Fort Matanzas National Monument, was the scene of crucial events in Spanish colonial history. The defeat of French soldiers here in 1565 initiated Spain's establishment of its first permanent colony in Florida. The construction of Fort Matanzas in 1740-42 was Spain's attempt to stop British encroachments on St. Augustine (Smith 2006).

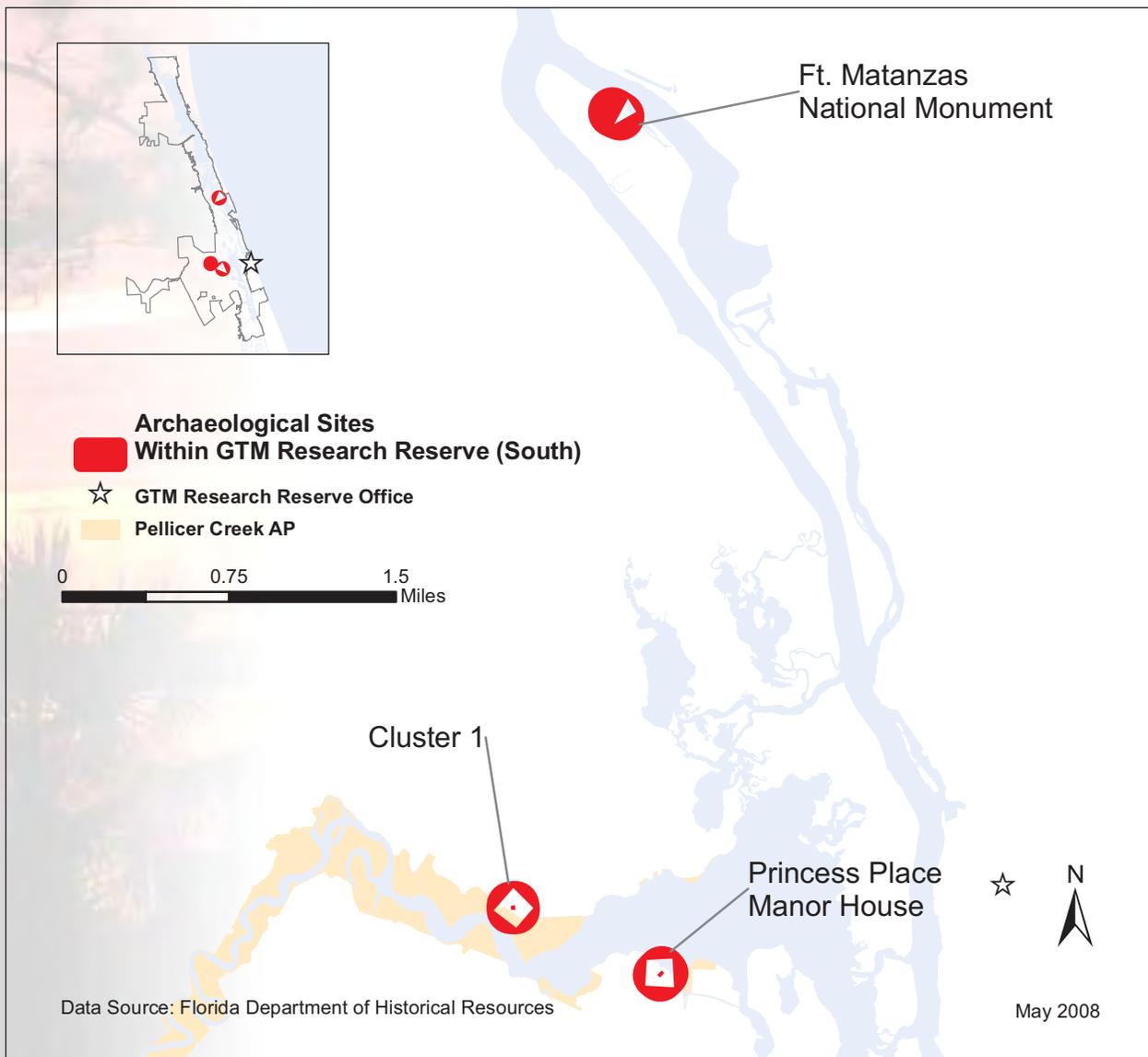


Figure 17 | Cultural resources of the GTM Research reserve's southern component excluding sites containing known native american artifacts.

Although likely to be significant, much less is known about underwater archaeological resources in the GTM Research Reserve. The GTM Research Reserve recently cosponsored, along with the Lighthouse Archaeological Maritime Program (LAMP) in St. Augustine, a symposium on underwater archaeology to bring together experts in this field and to promote collaboration on future research and educational initiatives within the GTM Research Reserve. It is one of the GTM Research Reserve's goals to enhance regional understanding, interpretation and preservation of cultural resources by proactively working with state, federal and local agencies, academic institutions, private industry and citizens.

4.3 / Compatible and Traditional Uses

Community leaders along with state, federal and local governments have preserved extensive areas within the watershed of the GTM Research Reserve. This opportunity provides a unique setting for ecosystem level scientific research and monitoring necessary to study and set restoration goals for conserving the natural biodiversity in the region. Serving as a living laboratory and classroom, the GTM Research Reserve is well suited to encourage compatible use by present and future generations.

Compatible consumptive and nonconsumptive use of the GTM Research Reserve's natural resources provides a valuable resource for the local community. Ecotourism and recreational uses within the GTM Research Reserve including boating, picnicking, swimming, sport fishing, cast netting, hunting, group camping, primitive camping, hiking, biking, horseback riding, canoeing, kayaking and nature study are outstanding. There are ample public access points (Figures 18, 19). Currently there are eleven boat ramps, four picnic areas, twelve parking lots, eight trail heads and three designated camping areas in the GTM Research Reserve with many public access sites serving multiple functions.

The GTM Research Reserve also contains magnificent vistas and photographic opportunities across expansive salt marshes and miles of undeveloped beaches. Wildlife viewing, especially birds, is excellent. Washington Oaks Gardens State Park has an extensive plant garden for viewing along the Matanzas River and a unique coquina rock outcrop, the Anastasia Formation. Fort Matanzas National Monument provides exhibits and tours of historical significance. Faver-Dykes State Park provides for nature study, camping, picnicking and canoeing. Princess Place Preserve has many unique cultural features and is managed by Flagler County for its historical preservation and recreational value. The GRWMA provides outstanding resources for hunters and nature enthusiasts.

Sport fishing for estuarine species includes drum, menhaden, spotted sea trout, weakfish, spot and flounder. Oceanic sport fishing species include blue fish, sharks, wahoo, barracuda,



Figure 18 / Public access points within the northern component of the GTM Research Reserve.

mackerel, mahi mahi, cobia, snapper and grouper. Limited recreational oyster and hard clam harvesting throughout the estuary occurs as well. The natural resources of the GTM Research Reserve are also valued commercially through aquaculture (oyster and clam leases), ecotourism, fishing charters, tackle shops and other marine trade businesses.



There are currently six aquaculture leases within the GTM Research Reserve totaling 42 acres. Other consumptive commercial resource use in the estuarine system include fishing for penaeid shrimp, blue crabs, clams, scallops, oysters, and various finfish species. Of these, blue crabs and shrimp are the most predominant. Sustainability of the habitats that support these resources is a management priority for the GTM Research Reserve.

The beaches along the Atlantic Ocean are one of the main reasons that tourists are attracted to the area. CAMA directly manages nearly five miles of virtually undeveloped Atlantic coastal beachfront. The beach dunes are some of the highest in Florida. Combined with the availability of platform overlooks, these beach dunes accommodate tens of thousands of visitors each year with grand vistas of some of Florida's last remaining barrier island scenery. The dune system represents some of the last undisturbed high dune habitat along the Atlantic coast. Additionally, there are numerous historical attractions and cultural resources which must be carefully studied and interpreted, some of which have yet to be discovered. A scientific means to define sustainable carrying capacity is essential to ensure long-term conservation of these habitats. Another identified need is to conduct a scientific evaluation of the economic relevance of coastal resource protection for the region to evaluate the costs and benefits of conservation efforts.

GTM Research Reserve staff recently completed a year-long Visitor Use Survey to document relative frequencies of various types of recreational public use, including the Guana Dam, the trail system, and the Atlantic beaches (Figure 20). The survey was administered to visitors randomly over a variety of time periods from January through December 2006.

The Visitor Survey also provided an opportunity for visitors to provide recommendations for improvements to the visitor experience. Some of these recommendations were readily implemented when determined to be consistent with the GTM Research Reserve's resource protection goals. Such recommendations included additional benches and picnic tables at the dam and on the trail system, and additional interpretive kiosks on the trail system.

The visitors survey identified the need for additional signage for visitors at the four beach dune crossovers, including interpretive signage

Figure 19 | Public access points in the southern component of the GTM Research Reserve.

regarding the North Atlantic right whale, nesting shorebirds, and general public information. Stewardship staff has initiated work to meet these needs and will continue to do so as needed.

The visitor survey also suggests that fishing is the single most frequent public use of the surveyed areas. The Guana Dam is the most popular location for fishing, crabbing and shrimping, and is open to the public from 4:00 AM to 11:00 PM daily. Fishing pressure at the dam can be intense during peak conditions, and may be applying excessive pressure on the natural resources there. As Guana Lake is managed by FWC, discussions with the staff of the Guana River Wildlife Management Area might provide some guidance on gamefish stocks there. Access to the dam and lake shore is managed by GTM Research Reserve, so any changes in management of this public opportunity would need to be resolved cooperatively between the two agencies.

GTM Research Reserve staff has occasionally received requests from the public for overnight access to the dam. These requests are primarily from fishermen and shrimpers, but also include astronomy clubs wishing to take advantage of the dark skies of the GTM Research Reserve. The GTM Research Reserve may wish to explore the need to issue special permits for overnight access to the dam, but any decision regarding that would need to include the elements of public security and resource protection.

GTM Research Reserve staff recently concluded a pilot project for expanded equestrian opportunities. Based on the lack of evidence of bacteriological contamination, horseback riding on the beach will be allowed to continue. Horseback riding on the beach is allowed with the following conditions: horses are allowed only below mean high tide, within 3 hours of daily low tide. These restrictions are necessary for resource protection. The trail system will also remain open for equestrian user groups seven days per week. Additional restrictions may be necessary but only if scientifically-based monitoring results indicate natural resource damage.

GTM Research Reserve staff work cooperatively with several local Boy Scouts of America (BSA) troops and 4-H clubs to provide public use amenities and resource restoration projects. A new interpretive

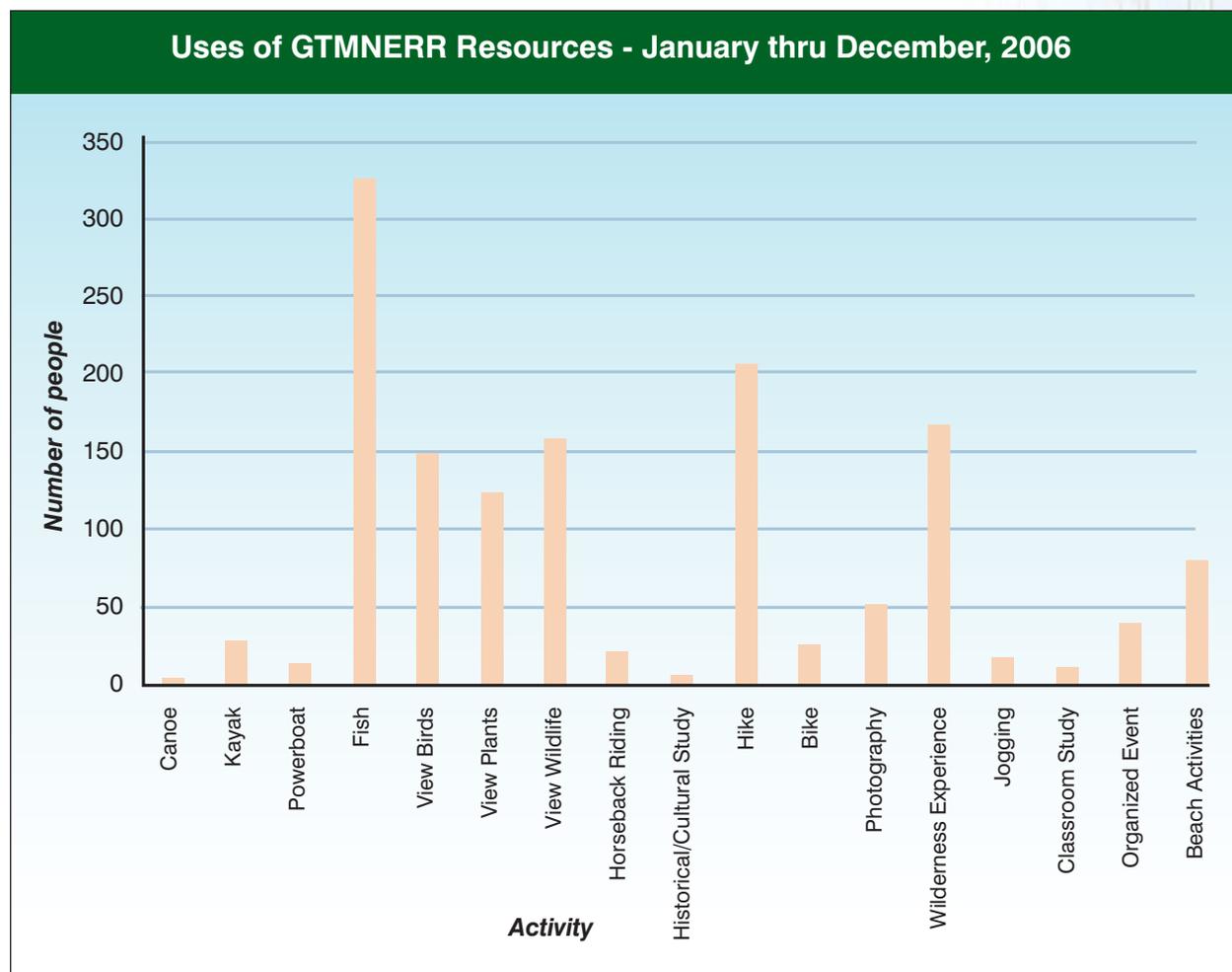


Figure 20 | Relative public use by type based on a one-year survey conducted at the GTM Research Reserve from January through December of 2005.

kiosk was constructed and installed by BSA at Shell Bluff Landing in 2006. This kiosk provides interpretive information on some aspects of the cultural significance of the Guana peninsula. Additional interpretive kiosks on the trail system are needed to provide information on the rich archaeological and cultural history of this site.

Table 2 / Compatible public use within the GTM Research Reserve.

Analysis of Multiple-Use Potential for the GTM Research Reserve			
Activity	Approved	Conditional	Rejected
Protection of endangered and threatened species	X		
Ecosystem maintenance	X		
Soil and water conservation	X		
Hunting			
Fishing	X		
Wildlife observation	X		
Hiking	X		
Bicycling	X		
Horseback riding	X		
Timber harvest		X	
Cattle grazing			X
Camping			X
Apiaries		X	
Linear facilities			
Off road vehicle use			X
Environmental education	X		
Citriculture or other agriculture			X
Preservation of archaeological and historical sites	X		
(Other uses as determined on an individual basis)		X	

Most of the waters of GTM Research Reserve are currently managed for multi-use functions, including research, education, and public recreation. The waters of the GRMAP and the PCAP are classified as Outstanding Florida Waters (OFW). The submerged lands within the northern component of the GTM Research Reserve and along populated shorelines of the Matanzas River are mainly classified as conditionally restricted with regards to shellfish harvesting. Submerged lands within PCAP are unclassified therefore shellfish harvesting is not permitted pending bacteriological and sanitary surveys. The most extensive area of conditional approved shellfish harvesting occurs along the western shore of the Matanzas River just south of the CR206 Bridge. More detailed and up-to-date information concerning shellfish harvesting can be found at www.floridaaquaculture.com/SEAS/SEASmngmt.htm.

Alternative uses of properties within GTM Research Reserve have on several occasions been proposed by sectors of the public. Proposals for alternative use have involved various public infrastructure projects, including a public high school, highway lane expansions, and a cell phone tower. GTM Research Reserve staff refrained from support of these projects as the best available information indicated that these activities were inconsistent with the mission of the NERRS and the conservation/recreation goals of state acquisition.

Fee based public recreation that is consistent with resource protection continues to offer the preferred revenue generation opportunity of the GTM Research Reserve. An automatic pay entry station was installed by GTM Research Reserve staff as part of the parking lot improvement project at the dam in 2005. Entry fees to the Guana Dam and public trails are collected at this station and have significantly enhanced revenue generation versus the former honor system of payment.



Natural dunes protect inland areas from storm damage, serve as wildlife habitats, and support beach processes resulting in outstanding recreational opportunities.

4.4 / Non-CAMA Managed Public Lands within the GTM Research Reserve Boundaries

Northern Component

FWC's Guana River Wildlife Management Area

(myfwc.com/RECREATION/guana_river/default.asp)

The GRWMA is located about 15 miles south of the Jacksonville metropolitan area and 13 miles north of St. Augustine. It is within the northern component of the GTM Research Reserve. The southern boundary is shared with the CAMA managed unit, and the western boundary connects to the Tolomato River. This area consists of central and northern marshes, interior uplands and Lake Ponte Vedra and is composed primarily of coastal maritime ecosystems. It is uniquely situated to afford recreational opportunities to a large segment of Florida's population, as well as to tourists who traditionally visit the area.

Water resources on GRWMA are among the most prominent features in the area, and include estuarine (tidal) waters of the Tolomato River, interior impoundments, marshes, swamps and five artesian wells. These waters are currently designated as OFW under section 17-3.041(c), Florida Administrative Code.

The GRWMA is unique in that it contains a vast diversity of natural, cultural and recreational resources. There is an extensive area of undisturbed scrub vegetation; a large maritime hammock containing an unusual natural association of mature trees; extensive estuarine wetlands; extensive areas of pine flatwoods; bird rookeries, including a sizable population of the endangered wood stork; and extensive aboriginal middens, aboriginal burial mounds and artifacts of aboriginal and Spanish colonial origin.

The diversity of the vegetative communities on GRWMA is one of the GTM Research Reserve's most striking features. These communities, which are highly influenced by coastal maritime conditions, are also characteristic of the Sea Island Coastal Region of southern Georgia. A formal survey of vegetative species composition, density and frequency of occurrence within plant communities was initiated in

the spring of 1989. The purpose was to develop a characterization of vegetative communities within GRWMA. There are approximately 1,918 acres of pine stands of various ages and densities on Guana GRWMA. Approximately 779 acres of the pine area is comprised of commercial plantations, with the remainder comprising natural stands of various densities. Scenic features include upland vegetation characteristic of mature maritime forest hammocks.

Florida Division of Forestry's Deep Creek State Forest

(www.fl-dof.com/state_forests/)

These lands are managed for multiple uses including, but not limited to, timber management and restoration, low impact recreational opportunities, and protection of archaeological and historic sites.

St. Johns River Water Management District's Stokes Landing Conservation Area

(www.sjrwmd.com/recreationguide/n15/l)

This conservation area is located in St. Johns County, approximately 3 miles north of downtown St. Augustine. Stokes Landing Conservation Area is open to the public for recreational activities such as hiking, bicycling, wildlife viewing, and fishing.

The Stokes Landing Conservation Area is composed of approximately 226.78 acres (75%) of uplands and 74.39 acres (25%) of wetlands. The property encompasses five different natural communities: tidal marsh; depression marsh; maritime hammock; flatwoods; and scrubby flatwoods. The property adjoins the tidal marshes of the Tolomato River. Stokes Landing Conservation Area is a key tract in linking several other public lands in Eastern Florida. The conservation area is adjacent to the Northeast Florida Blueway Phase II Florida Forever Project.

Southern Component

National Park Service's Fort Matanzas National Monument

(www.nps.gov/foma/)

Fort Matanzas National Monument is located about 15 miles south of the historic district of St. Augustine, Florida with access via an entrance on SR A1A. Fort Matanzas guarded the southern inlet leading to the first permanent European settlement in the continental United States. As such, Fort Matanzas, built in 1741, represents one of the oldest and most well preserved historical structures within GTM Research Reserve. Fort Matanzas was designated as a National Historic Site in 1924.

The original national monument site consisted of only the fort on Rattlesnake Island. Through the years, however, the National Park Service has been able to acquire additional land both on Rattlesnake and on adjacent Anastasia Island to conserve a portion of an intact barrier island ecosystem. The river and ocean beaches as well as the 0.6 mile nature trail offer visitors the opportunity to view a variety of plants and wildlife native to this ecosystem.

The distinct habitats located within Fort Matanzas National Monument harbor a number of species, several of which are listed as endangered or threatened. From May to August, the ocean beach is the nesting site for sea turtles, including the threatened loggerhead and the green and leatherback, both of which are endangered. The beach is also home to the least tern, and presumably the endangered Anastasia Island beach mouse.

The gopher tortoise, a species of special concern in Florida, is found in the scrub habitat along with the endangered eastern indigo snake and five-lined skink. Herons, egrets, and endangered wood storks feed on the mud flats which are also the home of fiddler and hermit crabs. Ospreys, bald eagles, skimmers, pelicans, terns, and gulls can be seen flying over the Matanzas River, and it is not unusual to sight dolphins or manatees.

Fort Matanzas National Monument is an important historical location in northeast Florida. Initial construction at Fort Matanzas started in 1569 with a wooden watchtower and thatched hut. These structures were later replaced with a coquina fort. The fort was critically important in guarding Matanzas Inlet, which was the key to guarding St. Augustine. Ownership of St. Augustine was constantly contested between the British and Spanish empires, and the fort was a witness to important historical battles. This included the blockade of St. Augustine by James Oglethorpe in 1740. The fort helps to ensure that the history and importance of this area will continue to be known and understood.



Forests are needed for clean air and water, to cycle and move nutrients, maintain biodiversity, and moderate the impact of climate change by storing atmospheric carbon.

Florida Park Service's Florida Division of Recreation and Parks (Washington Oaks Gardens State Park)

(www.floridastateparks.org/washingtonoaks/)

Washington Oaks Gardens State Park is located in Flagler County about 20 miles south of the City of St. Augustine. The park is bordered by the Atlantic Ocean on the east and the AIWW on the west and consists of 423.31 acres. In the management of Washington Oaks Gardens State Park emphasis is placed on the natural and cultural resources and the maintenance and enhancement of the historic gardens. Recreational uses are passive. Activities in the park have been limited to the gardens, picnicking, nature trails and necessary support facilities. Park programs emphasize interpretation of the park's natural and cultural resources.

The park contains nine distinct natural communities in addition to ruderal and developed areas; beach dune; coastal strand; maritime hammock; mesic flatwoods; scrubby flatwoods; shell mound; estuarine tidal marsh; marine consolidated substrate; and marine unconsolidated substrate. The hammock, scrub, and coastal strand communities and the rock outcroppings on the beach provide habitat for a variety of wildlife. A total of 45 listed species have been documented in or over the park. Their occurrences range from full-time residences breeding in the park to casual visitors. Two species of marine turtles have been documented nesting on the park beach, the loggerhead (*Caretta caretta*) and the green turtle (*Chelonia mydas*). Gopher tortoises are found throughout the park and Florida scrub-jays were once residents as well. The park also contains a rare Anastasia Formation outcrop on the beach. This outcrop provides an important source of hard bottom substrate that is colonized by a large number of unique plants and animals. There are many opportunities for visitors to observe a wide variety of plant and animal species in the park.

East central Florida has a rich cultural prehistory and history. The area that today is Washington Oaks Gardens State Park saw occupation and/or utilization by a cultural sequence of Archaic, Mount Taylor, Orange, Transitional, St. Johns, First Spanish Period, British Period, Second Spanish Period, Territorial and Seminole (Milanich 1980).

Washington Oaks contains evidence of prehistoric occupation as well as historic use. Washington Oaks also has a substantial historic component. This includes nineteenth- and early twentieth century sites associated with the Bella Vista Plantation, as well as sites associated with the ornamental gardens dating from the late 1930s - 1950s.

Access to the AIWW bordering the western shoreline of the park is available for fishing and scenery appreciation. The Atlantic beachfront contains unique natural coquina rock outcroppings. This park provides quality visual resources. The ornamental gardens are particularly attractive, as are the hammock, coastal strand, scrub, and beach communities. Scenic vistas are available from both shoreline areas of the park.

Florida Park Service's Faver-Dykes State Park

(www.floridastateparks.org/faver-dykes/)

Faver-Dykes State Park is located in St. Johns County and is bordered east, north and south with conservation lands. Although some of this property was logged prior to state purchase and is being restored, the overall significance of this property remains. At Faver-Dykes State Park, public outdoor recreation and conservation is the designated use of the property. Faver-Dykes State Park contains 6,045.89 acres.

The park contains thirteen natural communities in addition to ruderal and developed areas: coastal berm; mesic flatwoods; sandhill; scrubby flatwoods; upland mixed forest; basin swamp; depression marsh; dome swamp; floodplain swamp; flatwoods lake; blackwater stream; and estuarine tidal marsh. The variety of plant communities accounts for the abundant wildlife present. Pellicer Creek is home to waterfowl, alligators, otters and raccoons. Deer, turkey, hawks, owls, squirrels, bobcats, foxes and opossums range throughout the uplands. Ten listed plant species and 26 listed animal species occur at Faver-Dykes. The park records occasional sightings of Florida black bear (*Ursus americanus floridanus*). Gopher tortoises (*Gopherus polyphemus*), gopher frogs (*Rana capito*), and striped newts (*Notophthalmus perstriatus*) also occur within the unit. There is a bald eagle (*Haliaeetus leucocephalus*) nest within the park and three more within five miles of the park.

Northeast and East Central Florida have a rich cultural prehistory and history. The area around Pellicer Creek was occupied and utilized by Native Americans during the full sequence of Precolumbian cultural periods, beginning with the Paleo Indian, and continuing through the Archaic, Mount Taylor, Orange, Transitional and St. Johns Periods. Technological changes observed in the archaeological record, and evidence of increasing populations, marked each progressive period. The list of Native American cultures also includes the Seminole, although they are descended from Lower Creeks who fled from Georgia and Alabama to north Florida in the 18th century (Milanich and Fairbanks 1980, Milanich 1994, Milanich 1995, Stanton 2001).

The park contains magnificent vistas across expansive salt marsh along both Pellicer Creek and the Matanzas River. The salt marsh is of high quality, reflected in the variety of fish and wildlife resources that occur at this site. Wildlife viewing, especially birds, is particularly good. The expanse of marsh, the quiet waters of Pellicer Creek and the changing banks of the blackwater stream are significant.

St. Johns River Water Management District's Moses Creek Conservation Area

(www.sjrwmd.com/recreationguide/n10/)

Moses Creek Conservation Area is located in St. Johns County south of St. Augustine and is within the Northern Coastal Basin. The property lies in the area of confluence of Moses Creek and the Matanzas River. The property is bounded to the north by a housing development, to the west by schools, and to the south by small neighborhoods and SR 206. The entire eastern boundary of the property is the Matanzas River. Moses Creek Conservation Area comprises approximately 2,173 acres.

Moses Creek contains thirteen natural communities: flatwoods; slope forest; sandhill; scrub; tidal marsh; blackwater stream; freshwater tidal swamp; upland mixed forest; tidal flats; depression marsh; basin swamp; dome swamp; and floodplain swamp.

The diversity of natural communities at Moses is so great that the creek itself runs through three separate communities within the conservation area boundary. Slope forest grades into the creek as it enters the property. The slope forest community then gives way to tidal swamp. Finally the creek winds through tidal marsh for a majority of its route through the conservation area. Other communities represented on the conservation area include flatwoods, sandhill, scrub, depression marsh, upland mixed forest, strand swamp, and tidal flats.



The Anastasia Island beach mouse is one of many rare or endangered resident species that depend on the conservation of natural lands within the GTM Research Reserve.

Moses Creek Conservation Area surrounds one of the last undisturbed tidal marsh creek systems along the east coast of Florida. Additionally, the property has a diverse system of upland and wetland communities.

St. Johns River Water Management District's Pellicer Creek Conservation Area

(www.sjrwmd.com/recreationguide/nc07/)

Pellicer Creek Conservation Area is located in northeastern Flagler County, lies along the southern shoreline of Pellicer Creek and contains approximately 2,997 acres. The site has about 6.3 miles of frontage along Pellicer Creek and is located approximately 1.5 miles west of the Matanzas River, which is part of the Atlantic Intracoastal Waterway.

The District and the FWC have worked together to establish a Fish Management Area within the conservation area.

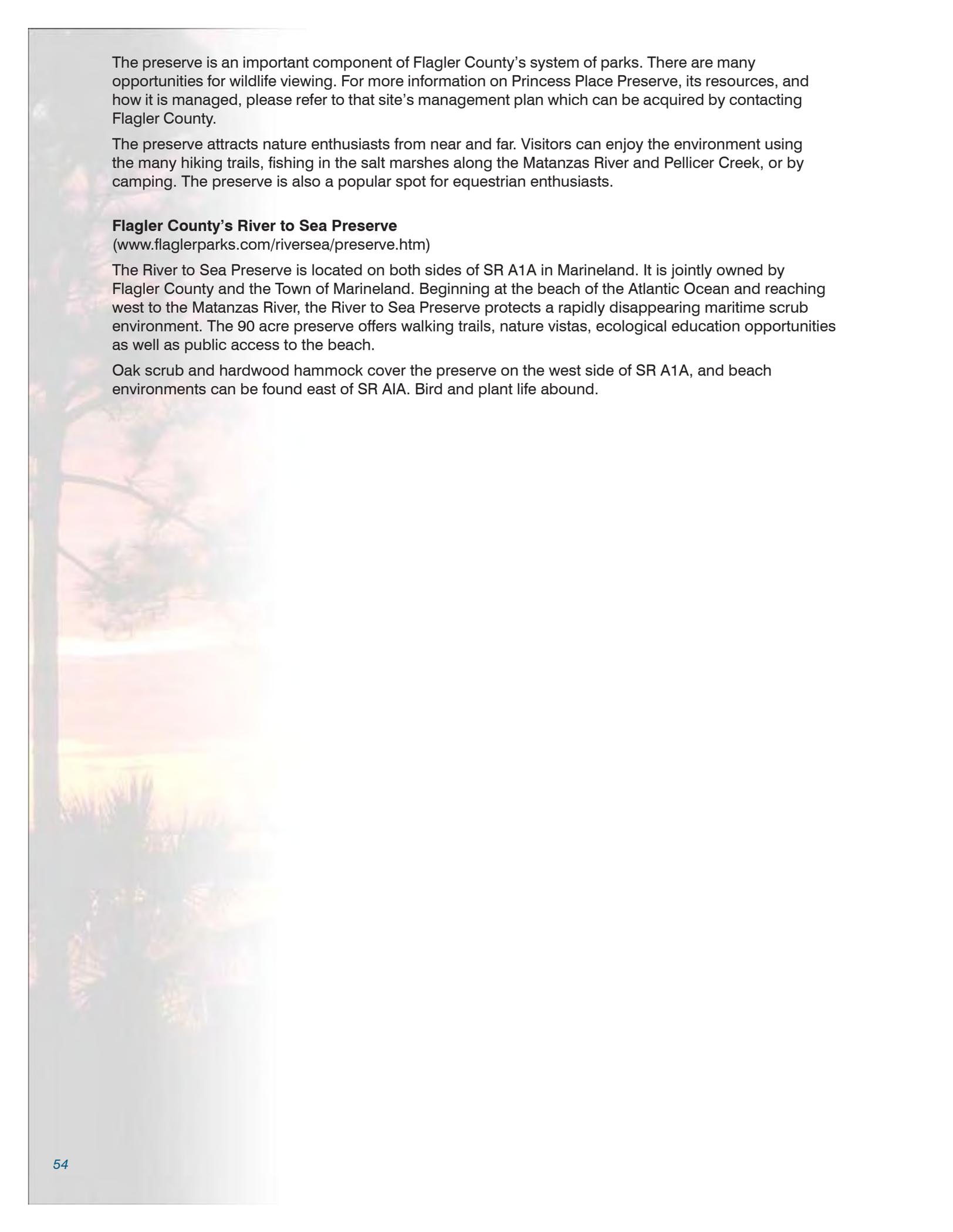
Approximately 34 percent of the Pellicer Creek Conservation Area is wetland and 66 percent is upland. Much of the vegetation present on the property reflects its previous management as a pine plantation. The area contains ten natural communities: tidal marsh; blackwater stream; upland mixed forest; sandhill; pine flatwoods; scrubby flatwoods; floodplain swamp; dome swamp; depression marsh; and scrub.

An extensive network of public land surrounds Pellicer Creek Conservation Area. Collectively, these lands make up the Pellicer Creek Conservation Corridor.

Flagler County's Princess Place Preserve

(www.flaglerparks.com/princess/preserve.htm)

The Princess Place Preserve is located on a knoll overlooking the confluence of Pellicer Creek and the AIWW, the estate was once home to a Russian Princess. It was built as a hunting lodge in 1886 by Henry Cutting and is the oldest standing structure in the county. Princess Place has a rich history and contains 1500 pristine acres.



The preserve is an important component of Flagler County's system of parks. There are many opportunities for wildlife viewing. For more information on Princess Place Preserve, its resources, and how it is managed, please refer to that site's management plan which can be acquired by contacting Flagler County.

The preserve attracts nature enthusiasts from near and far. Visitors can enjoy the environment using the many hiking trails, fishing in the salt marshes along the Matanzas River and Pellicer Creek, or by camping. The preserve is also a popular spot for equestrian enthusiasts.

Flagler County's River to Sea Preserve

(www.flaglerparks.com/riversea/preserve.htm)

The River to Sea Preserve is located on both sides of SR A1A in Marineland. It is jointly owned by Flagler County and the Town of Marineland. Beginning at the beach of the Atlantic Ocean and reaching west to the Matanzas River, the River to Sea Preserve protects a rapidly disappearing maritime scrub environment. The 90 acre preserve offers walking trails, nature vistas, ecological education opportunities as well as public access to the beach.

Oak scrub and hardwood hammock cover the preserve on the west side of SR A1A, and beach environments can be found east of SR A1A. Bird and plant life abound.



The GTM Research Reserve is habitat to migrating species such as loggerhead sea turtles, North Atlantic right whales, and peregrine falcons.

Part Two

Management Programs and Issues

Chapter Five

Program Accomplishments

5.1 / Current Status of the Ecosystem Science Program at the GTM Research Reserve

The role of the GTM Research Reserve Ecosystem Science Program is (in order of a logical progression) to:

1. Provide logistic support for visiting scientists toward expanding our understanding of basic and applied ecological processes related to the reserve and its watershed,
2. Summarize existing scientific information with the purpose of communicating the status and trends in pollutants, habitats, and biological diversity of the reserve's ecosystems and to identify additional research needs to obtain this information,
3. Initiate new research initiatives and monitoring projects to fill gaps in our understanding key ecosystem functions and services pertaining to pollutants, habitats, and biological diversity, and
4. Develop and guide best management practices as solutions to harmful trends in pollutants, habitats, and biological diversity as detected by scientific research. To date, most of the activities of the GTM Research Reserve estuarine research program have focused on logistic support of visiting scientists to understand ecological processes related to the reserve and its watershed. The goals, strategies, and objectives of this management plan (Ecosystem Science Strategies Chapter 6) represent a significant enhancement of the reserve's ability to prioritize research needs and integrate the results into its education and resource management programs.

Development of the facilities and acquisition of equipment needed to support research and monitoring activities has been a major part of implementing the GTM Research Reserve ecosystem science



Research is necessary to follow trends and sustain local recreational and commercial fisheries.

program. Particular effort has been devoted to bringing the various elements of the National Estuarine Research Reserves' System Wide Monitoring Program (SWMP) into operational status in compliance with the national directives. This program now includes four water quality monitoring stations at which YSI 6600 datasondes are deployed and collect a suite of abiotic parameters at 15 minute intervals, a weather station that collects a variety meteorological data at 15 minute intervals and nutrient plus chlorophyll analyses of water samples collected monthly at each of the water quality stations in addition to a diel sampling regime carried out once a month at the Pellicer Creek site. Both the weather station and the water quality station at Pellicer Creek have satellite telemetry which provides near real-time data availability.

Beyond the SWMP initiatives, a range of mapping, research, monitoring and modeling activities prior to and following establishment of the GTM Research Reserve in 1999 have helped provide important information on several aspects of its estuarine systems and associated issues of concern. Much of the work has been pioneering for this relatively unstudied region of northeast Florida, affording important baseline information and understanding for a broad array of the complex natural systems and processes of the GTM estuaries. These studies have ranged from hydrodynamic modeling to fisheries and microbial investigations, performed chiefly by various agencies or students and researchers from academia. A lead role on many of these efforts has been taken by the NCB Program of the SJRWMD, often in partnership with the GTM Research Reserve. It is also noteworthy that several projects have been performed by graduate students supported through the NERR's Graduate Research Fellowship (GRF) Program, an initiative that provides master's degree students and Ph.D. candidates with an opportunity to conduct research of local and national significance that focuses on enhancing coastal zone management. Together, the knowledge gained from these diverse studies has importantly contributed to a foundation upon which future ecosystem science initiatives can build and has served as a vital part of the platform from which informational gaps and issues have been identified in the formulation and focus of this management plan.

A comprehensive summary of all past and ongoing research, monitoring and mapping activities for the GTM Research Reserve is provided in its site profile. This document also reiterates many of the research/monitoring informational gaps and needs that are addressed in the goals, objectives and strategies of this management plan. Selected examples of past and present ecosystem science activities are briefly summarized below to illustrate the range of work that has contributed to our

understanding of different elements of the GTM estuarine system. The reader is referred to the Site Profile for a more detailed discussion and bibliography.

1. A three-year fisheries monitoring project initiated in November of 2001 focusing on surveying the distribution and abundance of fish species as a function of habitat and season within the GTM Research Reserve south to Ponce Inlet. It was funded and managed through the Northern Coastal Basin (NCB) Program of the St. Johns River Water Management District in conjunction with the USGS Biological Resources Division, and involved cooperation with a number of partner agencies in terms of resources and field assistance. This was the first survey of its kind within the GTM Research Reserve's estuaries, and yielded important insights on the seasonal diversity and distribution of fish species.
2. Development of a 2-dimensional hydrodynamic model of the GTM Research Reserve; again, funded through the NCB program. A work in progress, it can be used to predict changes in water level and velocity for specific ocean tides and wind conditions. This effort has contributed to a fundamental understanding of circulation patterns within the GTM system.
3. Delineation of emergent marsh vegetation within the GTM Research Reserve. This recently completed GIS-based project was a partnership study with the SJRWMD funded in part by the GTM Research Reserve. This work was a pilot "bio-monitoring" study to map marsh vegetation as a step towards assessing historical differences and future change.
4. Guana, Tolomato, Matanzas Shellfish Task Force Report. Generated prior to the GTM Research Reserve designation, this report by a multi-agency and university task force was an analysis of fecal coliform levels in shellfish harvesting waters. The task force was assembled to identify potential sources of fecal coliform that led to re-classification of shellfish harvesting waters in St. Johns County.
5. A GRF project to understand the southerly fall migration of bluefish to over wintering grounds. The study examined the abundance and distribution patterns of this species during the fall and winter months in the vicinity of both the St. Augustine and Matanzas Inlets. The project analyzed aspects of distribution, essential habitat, diet and condition. The work yielded detailed information on use patterns of the Matanzas River estuary by bluefish during the winter.
6. Development of molecular tools for measuring levels of *Vibrio vulnificus* (a food borne pathogenic microorganism) in estuarine waters. Infections from this bacterium are most frequently contracted after raw oyster consumption. Real-time PCR assays were developed that are sensitive, specific and quantitative for *V. vulnificus* in water samples and oyster tissue. The assays may therefore be useful tools for rapid detection of the pathogen in shellfish and estuarine waters.
7. A long-term project to understand and document calving behavior and population dynamics of the critically endangered right whale. From December through March researchers fly aerial surveys to locate right whale mothers as they migrate to the waters off Florida and Georgia to have their calves. The ability to identify individual whales through photo identification allows researchers to collect an entire life history of each right whale and to track their movements and associations with other whales.
8. Use of the GTM Research Reserve as a model system for comparing the effects of different nutrient load scenarios in highly flushed estuaries. The objective of this in-progress GRF project is to determine the differences in the response of selected components of the benthic and attached biota to nutrient load profiles.
9. A project to assess the response of the GTM Research Reserve to extreme events (i.e., tropical cyclones, strong coastal upwelling events, northeasters). This ongoing GRF project uses numerical models of estuarine hydrodynamics, calibrated and verified by field measurements, to synthesize data and assess this ecosystem response.
10. Development of a multi-channel handheld analyzer to detect estuarine microbial contaminants based upon Nucleic Acid Sequence Based Amplification. This CICEET funded, technology-development project has the objective of generating a faster, more sensitive method of detecting harmful algal blooms in coastal waters.

The GTM Research Reserve's GIS program has experienced increasing demands to support its research, education, and stewardship programs with mapping products. The GIS lab has been established within the southern wing of the Environmental Education Center. The GTM Research Reserve's Biological Scientist and Information Technology Specialist provide the technical expertise for this program. Additional advanced training has been completed in recent months by staff to remain

abreast of current technology. The GTM Research Reserve has hosted an advanced GIS training class available to cooperating agencies in the area to help improve GIS capabilities for these partners.

As the ecosystem science program has grown, efforts have been made to support science information transfer for use by the GTM Research Reserve education sectors. These have included, for example, assistance in the development of Coastal Training Program (CTP) activities and workshops, guidance of a teacher intern in the development of a curriculum based on the SWMP data, contributing to the seminar programs, and developing informational posters on research activities for the Environmental Education Center (EEC). Similarly, cooperative efforts of research and resource management staff have emerged on various fronts, particularly for sea turtle nest monitoring and invasive species mapping and monitoring.

5.2 / *The Current Status of the Resource Management Program at the GTM Research Reserve*

The Resource Management Program addresses how CAMA manages the GTM Research Reserve and its resources. The GTM Research Reserve accomplishes resource management by physically conducting management activities on the resources for which it has direct management responsibility, and by influencing the activities of others within and adjacent to its managed areas and within its watershed. Watershed and adjacent area management activities, and the resultant changes in environmental conditions, affect the condition and management of the resources within our boundaries. CAMA managed areas are especially sensitive to upstream activities affecting water quality and quantity. CAMA works to ensure that the most effective and efficient techniques used in management activities are utilized consistently within our sites, throughout our program, and when possible, throughout the state. The strongly integrated Ecosystem Science, Education and Outreach, and Public Use Programs, provide guidance and support to the Resource Management Program. These programs work together to provide direction to the various agencies that manage adjacent properties, our partners and our stakeholders. The GTM Research Reserve also collaborates with these groups by reviewing various protected area management plans. The sound science provided by the Ecosystem Science Program is critical in the development of effective management projects and decisions. The nature and condition of natural and cultural resources within GTM Research Reserve are diverse. This section explains the history and current status of our resource management efforts.

Since its designation as a NERR in 1999, resource management has focused on the following areas: listed species monitoring and protection, reintroduction of prescribed fire as a restoration tool to appropriate upland communities within the watershed, control of invasive and nuisance species, protection of non-listed species, habitat restoration, land acquisition within the GTM Research Reserve watershed, cultural resource protection, and shoreline erosion control.

Past and ongoing resource management activities include:

1. GTM Research Reserve stewardship staff has assumed responsibility as primary permit holder for Marine Turtle Permit #140, in cooperation with the Florida Fish and Wildlife Conservation Commission (FWC). Under authority of this permit, the staff has lead responsibility for daily monitoring of 1 state index nesting beach covering 5.2 miles of Atlantic beach. The permit authorizes specific GTM Research Reserve staff and volunteers to conduct daily activities related to nest monitoring, stranding and salvage incidents of sea turtles on these beaches.
2. GTM Research Reserve stewardship staff has reintroduced prescribed fire as a management and public safety tool for appropriate fire dependent natural communities within the CAMA managed uplands of the GTM Research Reserve. GTM Research Reserve Prescribed Plan has been recently updated and revised. Included within the plan are 20 acres of mesic flatwoods, 45 acres of freshwater marsh, 15 acres of oak scrub, 2 acres of sand pine scrub, and 677 acres of coastal strand. Specific details of the GTM Research Reserve Prescribed Fire Plan (Appendix A 9).
3. GTM Research Reserve staff has detected the presence of several invasive exotic species in its waters and on its uplands in recent years. The predicted temperature increase associated with climate change is likely to increase the GTM Research Reserve's susceptibility to invasion by exotic species that have overwhelmed the south Florida landscape. Research indicates that rapid detection and eradication of initial recruits is the most cost-effect method to deal with this problem.
4. GTM Research Reserve staff has confirmed isolated cases of harm or harassment of non-listed plant and wildlife species within GTM Research Reserve boundaries. These cases are most evident on the CAMA managed uplands of The Guana River Marsh Aquatic Preserve. All plants and animals within the CAMA managed uplands are protected and cannot be collected without permission or a



Real-time monitoring of weather conditions contribute to a nationwide network of climate change information being compiled by the National Estuarine Research Reserve Program.

permit. The prevention of illegal removal of the natural resources of GTM Research Reserve requires a cooperative effort involving staff, local law enforcement, and the public.

5. The natural communities of GTM Research Reserve are subject to a variety of pressures, including local development, watershed impacts, climate change, invasive species, and unauthorized recreational use. GTM Research Reserve staff is actively restoring this degraded mesic flatwoods through prescription burning with a goal of increased biodiversity of its uplands and enhance buffering to the watershed of the Guana and Tolomato rivers. GTM Research Reserve staff is coordinating with the Division of Forestry regarding an assessment of an additional 50 acres of slash pine that have invaded a freshwater marsh on the Guana Peninsula. GTM Research Reserve staff has determined that removal of this timber would be consistent with resource management goals including hydrological restoration of this marsh. The DOF assessment will determine if the timber is of commercially viable quantity and quality (Appendix A 8). DOF works exclusively with contractors who are experienced in timber removal on environmentally sensitive lands in order to insure minimal disruption to resources.
6. Recent property acquisitions have added several parcels within the boundaries of GTM Research Reserve. Several parcels were recently acquired either by fee simple purchase on the east shore of the Matanzas River one mile north of Matanzas inlet. A conservation easement was acquired for a seven acre parcel located immediately north of Fort Matanzas National Monument, which the U.S. National Park Service has agreed to manage. Two smaller parcels were purchased immediately to the north, which St. John's County has agreed to manage. All three parcels provide physical buffers to the Matanzas River and its marshes. They also provide added protection to the view shed of Fort Matanzas National Monument.
7. The Northeast Florida Blueways (NEFB) program, a component of the Florida Forever Program, has served as the primary instrument for identifying potential parcels for acquisition within the GTM Research Reserve watershed. The majority of the parcels that were originally identified through NEFB have been developed, removed from consideration by the landowner, or acquired by the State of Florida. Two parcels, the Rogers Parcel and Hat Island remain within the GTM Research Reserve's



Conservation of natural biodiversity depends on science-based management the GTM Research Reserve's natural resources.

boundary. The GTM Research Reserve should also pursue a boundary expansion that reflects the growth of public lands adjacent to its boundary. Specifically, memoranda of understanding with Faver Dykes State Park and the Matanzas State Forest should be updated to reflect recent changes. Future plans for purchase or annexation of lands for inclusion into the GTM Research Reserve will be described in more detail in the GTM Research Reserve Acquisition Plan (Chapter 9).

8. With the rising prices for coastal property, the GTM Research Reserve may now need to focus on conservation easements and less than fee simple options for privately owned parcels as the best option for long-term watershed protection. In addition to the NEFB program, the GTM Research Reserve is obligated to form partnerships to support watershed scale planning beyond its immediate boundaries to ensure flow-ways and appropriate buffers are identified and conserved.
9. Current records indicate at least 25 known archaeological sites at GTM Research Reserve, located primarily on the CAMA managed uplands of the Guana Peninsula. Among the more significant known sites are Sanchez Mound, Wright's Landing and Shell Bluff Landing. Measures have recently been implemented to protect Sanchez Mound, a pre-Columbian burial mound, from feral hog damage by replacing 400 feet of hog fence around the perimeter of the site. Human looting of GTM Research Reserve archaeological sites is not known to be a significant problem currently.
10. Shoreline erosion appears to be a significant issue at several locations, including the western shoreline of Guana Peninsula and on the Atlantic beaches. Erosion on the eastern shore of the Guana River was stabilized in 2006 with the Environmental Education Center Dock and Shoreline Stabilization Project, in which 900 feet of shoreline was stabilized with a demonstration project that included revegetation with native north Florida coastal plant species.
11. Shoreline erosion on the eastern shore of the Tolomato River presents a threat to several cultural sites, including Shell Bluff Landing and Wright's Landing. Shell Bluff Landing is listed on the National Register of Historic Places. It consists of a large pre-Columbian shell midden and a coquina well whose origins have been dated to the early 19th century. Wright's Landing is the site of an historic wharf used during the English occupation (1764-1789) of the region and is also believed to be the site of a 17th century Spanish mission, the Nativity of Our Lady of Tolomato. There is also a prehistoric earthen burial ground located at the Wright's Landing site. The site has been nominated as a National Historic Site. Marsh restoration might be a viable strategy for protecting Wright's Landing from future deterioration.

5.3 / *Current Status of the Education and Outreach Program of the GTM Research Reserve*

The Education and Outreach Program components are essential management tools used to increase public awareness and promote informed stewardship by local communities. Programs include on and off-site education and training activities. These activities include: field studies for students and teachers; the development and distribution of media; the dissemination of information at local events; the recruitment and management of volunteers; and, training workshops for local citizens and decision-makers. The design and implementation of education programs incorporates the strategic targeting of select audiences. These audiences include all ages and walks of life; however, each represents key stakeholders and decision-makers. These efforts by the Education and Outreach Program allow the GTM Research Reserve to build relationships and convey knowledge to the community; invaluable components to successful management. The Education and Outreach Program encompasses the components of the NERR System K-12 Estuarine Education Program and Coastal Training Program.

Education programs are offered at the GTM Research Reserve Marineland office at the River to Sea Preserve and the Environmental Education Center. The opening of the GTM Research Reserve's Environmental Education Center in Ponte Vedra Beach on September 2005 has provided a state of the art facility that lead to a significant expansion of education and interpretive programs in the northern component of the GTM Research Reserve. Demand for programs at all levels continues to increase.

New programs are developed as a result of informal market analysis, needs assessments and public requests for topics and type of programs. During the next phase of the Education Program development, program evaluations will be designed and implemented to determine program impact and discern any tangible results gained by program participants. Programs will then be adjusted to improve desired results.

The GTM Research Reserve Education Team strives to meet the needs of a variety of audiences. There are three major components of the Education Program at the GTM Research Reserve: K-12 and Professional Teacher Development, Adult and Community Education, and the CTP.

Past and ongoing education and outreach activities include:

K -12 and Professional Teacher Development - Students and Teachers Program:

1. Students have the opportunity to visit the Environmental Education Center and the GRMAP as an extension of their classroom learning. The grade specific curriculum teaches the importance and interconnectedness of Florida's coastal resources, identifies the uniqueness of estuaries and provides students with the tools and increased knowledge needed to make difficult decisions about the future of these valuable coastal resources. The curriculum is correlated to the Sunshine State Standards in Science, and when feasible Math, Social Studies, and Language Arts. Pre and post visit lesson plans are available for use by the classroom educators. A High School Water Quality Curriculum has been written that uses GTM SWMP water quality data. This curriculum is available in hardcopy or CD upon request. Currently guided field trip programs have been developed for 4th grade, 7th grade (Living in Florida's Environment or LIFE Program) and high school. Fourth grade focuses on the estuary food web; 7th grade focuses on estuarine interactions and beach connections; and high school students study water quality. All students depart from the GTM Research Reserve knowing that they have a Research Reserve in their area, the importance of habitats, and what an estuary is. Curriculum for other grades may be developed in the future based on need and staffing levels. Additionally programs will also be offered in the southern component of the GTM Research Reserve as staffing and funding allow. The GTM Research Reserve school programs are offered at no charge which helps to keep programs attractive to teachers and students who may have financial constraints. However, diminishing school budgets have the potential to impact school visits. A shift in program focus to Teacher Trainings will allow teachers to take their students to closer field trip locations or conduct virtual field trips while still teaching about estuaries.
2. The LIFE Program establishes a series of field-based, environmental-science, education programs around the state. This program is a partnership between the GTM Research Reserve/DEP and Sebastian Middle School /St. Johns County School District. The goal of the LIFE Program is increased student achievement and teacher professional development in 7th grade science. The LIFE Program is a multi-day, field experience emphasizing current technologies for environmental science. The program emphasizes observation and inference as critical components of the scientific method, and integrates all subject areas by connecting field experiences with pre- and post- classroom lessons.
3. Self guided programs are available for the other grades that wish to visit the EEC. Teacher training workshops are being developed to enhance the self guided programs.

4. Workshops are offered to teachers and other professional educators. These professional teacher development programs promote the use of the GTM Research Reserve as a place for field trip/field study opportunities. These experiences also provide teachers with information and activities that they can use in the classroom or other field locations that may be closer to their school. In the future, these teacher trainings will instruct teachers on how to access SWMP data and use the CDMO website. In addition, the GTM Research Reserve partners with environmental education agencies and organizations throughout Florida to provide educators with a variety of professional development and training opportunities.

Adult and Community Education Program

1. A variety of educational activities are available at the GTM Research Reserve. Activities emphasize knowledge of, appreciation for and interaction with natural resources, such as seining, lectures, nature walks, and marsh ecology, along with nature movies, laboratory and exhibit hall experiences and craft sessions.
2. Outreach presentations are available to the general public and outside organizations. These presentations may include but are not limited to such topics as the GTM Research Reserve itself, volunteer opportunities, environmental and research topics, and coastal issues. A wide variety of groups such as Elderhostel, garden clubs, civic organizations, church groups and others request education programs offered by the GTM Research Reserve. The GTM Research Reserve also participates in many community events such as Earth Day, Estuaries Day, Beach Cleanups, Photo and Nature Festivals.
3. Tours of the GTM Research Reserve property emphasize natural and cultural resources. Self-guided walking tours are available to all during regular public-access hours. Guided walks, bicycle tours and kayak tours are scheduled throughout the year.
4. All programs for the general public are scheduled on a monthly basis and published in the GTM Research Reserve's email newsletter and website. The calendar announcements are also given to the local press for publication. The public programs can also be specially scheduled for large groups upon request and depending upon staff availability.

Partnering to offer education programs and information is a very effective strategy in times of tighter budgets. The GTM Research Reserve has formed extensive partnerships with local, State and Federal agencies and organizations. A few examples of the GTM Research Reserve working with partners at the national level are: Sea Grant to offer an Exploring our Environment class for adults that focuses on coastal conservation issues; the National Marine Fisheries Service on the protection of right whales; and the National Weather Service on lectures about hurricanes and climate change. Many additional partnership opportunities are built into our strategies over the next 5 years.

In addition to the onsite programs (Table 3) the GTM Research Reserve also has a very active outreach program. Outreach activities have focused on increasing public awareness about the GTM Research Reserve and involve the public in stewardship through the volunteer program, Friends of the GTM Research Reserve and community projects such as annual beach cleanups. Since many outreach activities take place at community fairs and festivals, it is difficult to estimate the # of citizens impacted. The GTM Research Reserve is working on a way to determine the impact and benefit of effort put into outreach activities.

Table 3 / Numbers of individuals reached with on-site education programs.

State Fiscal Year (July-June)	K-12 Students	Teachers/ Chaperones	Non-K-12 Program Attendees	Environmental Education Center Visitors
2005-2006	1015	258	888	16,073
2006-2007	2694	568	1200	14,993
2007-2008	2304	360	3360	15,490

One way is to look at the effectiveness of outreach programming is to examine the increase in volunteer numbers (Table 4.). Reserve volunteers are active in every aspect of reserve operations - stewardship, research, education and administration. The 2008 International Coastal Clean-up attracted 75 volunteers collecting close to 600 lbs. of trash from the 5 miles of coastline spanning the Guana and Marineland beaches.

Table 4 / Volunteers.

Year	Active volunteers	Hours served
2005	128	4900
2006	143	10700
2007	141	10454
2008	258	7322 and counting

Coastal Training Program Workshops

1. **Get Ready, Get SET; Your Stormwater Education Toolkit Training:** MRI, Inc. developed a toolkit to assist agencies that fall under the NPDES permit requirements for a stormwater education component. DEP NPDES regulatory office gave a presentation on the National Pollutant Discharge Elimination System (NPDES). Four case studies were conducted by teams in the workshop to discuss who the target audience should be for each case and how the training should be conducted.
2. **River to Sea Preserve at Marineland Coastal Habitat Restoration Public Meeting/Workshop:** General fire ecology and river to sea coastal strand restoration plan and public input taken. Many meetings were held to resolve the issue of restoring coastal scrub habitat, ranging from stakeholder meetings to public meetings to consultations with environmental experts. Restoration options for the coastal scrub portion of the preserve were discussed with Flagler County Parks and Recreation resource managers, and a plan was designed in a February 2005 governmental agency stakeholders planning meeting. This plan was presented to the March 2005 workshop audience.
3. **Energy and Resource Efficient Landscape Design:** The GTM Research Reserve partnered with University of Florida's (UF) St. Johns County IFAS Extension to offer an Energy and Resource Efficient Landscape Design Workshop on May 28, 2005 to improve the watershed and the surrounding Northeast Florida ecosystems by improving water quality. Carol Bennett from St. Johns County IFAS Extension's Horticulture program taught local residents about the importance of conserving energy and water in yards and how to create space for wildlife.
4. **Marine Invasive Species:** Whitman Miller, Assistant Director, Invasion Ecology Research Program Smithsonian Environmental Research Center presented an evening at Whitney sponsored by the GTM Research Reserve. (June 2003)
5. **Florida Fire Ecology/Florida Firewise Program Workshop:** As a follow-up to the March 2005 workshop, a Fire Ecology and Florida Firewise Program Seminar was offered in July 2005 to teach the public, planners, emergency management and elected officials about prescribed burning and the River to Sea Preserve restoration plan. The GTM Research Reserve partnered with the Florida Division of Forestry to offer the Fire Ecology and Florida Firewise Program. This workshop helped to improve ability of coastal decision makers to understand prescribed fire management within the GTM Research Reserve, to value the benefits of prescribed fire, and comprehend Florida fire regulations.
6. **Water Quality and Citizen Involvement Workshop:** In August 2005 The GTM Research Reserve partnered with the St. Johns River Water Management District and the Flagler County Sportsfishing Club to offer the Water Quality and Citizen Involvement Workshop. Citizens and county staff learned about water quality monitoring in Flagler County, about groups that they can join to help improve water issues, and participated in focus group sessions to identify issues that should be addressed in their county.
7. **DEP and Stormwater Academy NPDES Phase II Stormwater Education Workshop:** In September 2005 The GTM Research Reserve hosted the Department of Environmental Protection Stormwater Academy NPDES Phase II Stormwater Education Workshop. The workshop served county officials in the Northeast Florida area, discussed the requirements to obtain permits and provided examples of local storm water education programs.
8. **Stormwater, Erosion and Sedimentation Inspector Training Class:** The GTM Research Reserve hosted a Stormwater, Erosion and Sedimentation Inspector Training class for 36 Environmental Professionals. The goal of the program was to increase the proper design, construction, and maintenance of erosion and sediment controls during construction and to assure the proper long-term operation and maintenance of stormwater systems after construction is completed. The program curriculum was developed to educate the inspector on proper installation, inspection and maintenance of Best Management Practices (BMPs) for use during and after construction to minimize erosion and sedimentation and to properly manage runoff for both stormwater quantity and quality.

9. **Southeast Implementation Team for the North Atlantic Right Whale Meeting:** The Southeast Implementation Team (SEIT) for the Recovery of the North Atlantic Right Whale Conference was held at the GTM Research Reserve as right whale scientists on the Nation's east coast prepare for the year's calving season. SEIT is a multi-agency and citizen advisory group. The team develops management and research recommendations and assists in implementing the recovery plan. This conference is reoccurring once a year since 2005.
10. **DEP Train the Trainer Erosion and Sediment Control:** In November 2005 Train the Trainer workshops were offered by the DEP in order to prepare new instructors for implementation of the inspector's training program. The workshop covered the guidelines that instructors were required to follow in order to teach the class, plus also it allowed instructors the time to work on both their teaching skills and speaking abilities.
11. **Utilizing Science in Estuarine Management:** The GTM Research Reserve hosted University of Florida Estuarine Extension Agent Dr. Charles Jacoby for the Coastal Science Seminar on Thursday, November 17, 2005 "Utilizing Science in Estuarine Management: A Case Study from Australia."
12. **Prescribed Fire Workshop:** Prescribed Fire Workshop was held to share information about upcoming prescribed fire activities at the GTM Research Reserve. GTM staff, Partner Agencies and local citizens were involved in this workshop that explained logistics involved in performing a prescribed burn. (February 2006)
13. **Florida Landscaping Industry BMP:** Landscaping BMP workshop (February 2006) was offered to the landscaping and pest management industries in St Johns County. The primary goals of this workshop were to teach best management practices and increase awareness and compliance with the St Johns County Fertilizer ordinance. Topics included turf management, irrigation, landscape design, and pesticide BMP.
14. **Sea Turtle Patrol Coordination Training:** NE FL Sea Turtle Patrol Coordination meeting: The GTM Research Reserve staff coordinated a gathering of all Duval, St Johns and Flagler County sea turtle patrol organizations. This meeting helped to increase communication amongst patrol organizations, and provide for networking and additional training. (annually since April 2006)
15. **Southeast Regional Fire Learning Network:** The GTM Research Reserve hosted and participated in the First Southeast Regional Fire Learning Network lead by the Nature Conservancy. The vision of this network is to develop partnerships which will work to enhance ecosystem restoration, conservation and risk reduction through the successful application of prescribed fire, foster innovation, and transfer lessons learned to other projects, scientists, and key decision-makers. NGOs, local, state and federal agencies were in attendance at this meeting. (April 2006)
16. **Managing the Impacts of Residential Docks & Piers in Florida**

Day 1: Regulatory staff of DEP NED, CAMA AP Managers and other State agencies.
Day 2: Targeted local planners, regulators, natural resource managers, marine contractors, construction companies, non-profit agencies, and homeowners.

The GTM Research Reserve partnered with NOAA's Coastal Service Center (CSC), Rookery Bay National Estuarine Research Reserve (RBNERR) & Apalachicola National Estuarine Research Reserve (ANERR) to bring the workshop to the state, this workshop provided information on the construction and permitting of private docks and piers as well as, skills and tools to evaluated and manage environmental, visual, navigational and public access aspects.
17. **Green Lodging Workshop 2006:** Through this rapidly growing program DEP encourages the lodging industry to conserve and protect Florida's natural resources. The Florida Green Lodging Program is unique in that it covers an all-inclusive list of environmental initiatives that are specific to protecting and preserving Florida's environment
18. **Law Enforcement Cultural Resource Training:** The Training on Archaeological Resource Protection is a six hour course designed to familiarize state, federal, and county law enforcement agencies with archaeological resources and the laws that protect them. Agenda Highlights: Introduction to Cultural Resource Management, Archaeology and the Law, Responding to Archaeological Resource Crimes and "real-life" Scenario Discussion and Conclusions.
19. **Volunteer Cultural Resource Training:** This training was provided in a cooperative effort with Florida Department of Historical Resources staff. This was a two day training course was designed to train GTM Research Reserve volunteers to assist the stewardship staff meet their legal obligations while performing routine duties on Florida State lands so that the NERR complies with state and federal cultural resource protection laws.



Science-based education and outreach is a fundamental part of the GTM Research Reserve's management strategies.

20. **Geographical Information System (GIS) Training:** This training was a cooperative effort between St. Johns County and the GTM Research Reserve. This was a six day training session. The first two day session (1/9/07 -1/10/07) was a beginners' introduction to ArcGIS. The second two day (1/11/07 -1/12-07) was a second beginners' course. The third two day session (1/16/07 – 1/17/07) was an advanced course in ArcGIS.
21. **Inaugural Northeast Florida Underwater Archaeological Symposium:** The GTM Research Reserve in partnership with the St. Augustine Lighthouse Archaeological Maritime Program, Inc. (LAMP), The National Oceanic and Atmospheric Administration (NOAA), The Florida Public Archaeology Network, Florida Division of Historical Resources, St. Johns County and the St. Augustine Archaeological Association. The symposium covered a host of topics including pre-historic underwater archaeology, the archaeology of several shipwreck sites in Florida, agency jurisdictions of submerged cultural resources, international shipwreck projects and graduate student archaeological research projects
22. **Sustainable Development and Environmental Protection a Multi-Regional Project:** International Visitors Corps of Jacksonville and the State Department requested that we host and put together a one day workshop on Sustainable Development and Environmental Protection. Representatives deemed up and coming decision makers from 20 countries spent the day at the GTM Research Reserve. Topics covered at this workshop were: Coastal Restoration – Taylor Engineering (using case studies), Aquaculture – Florida Department of Agriculture and Consumer Affairs (FDOA&CA), Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET) and Surface Water Improvement Management (SWIM) Program, St. Johns River Water Management District.
23. **Professional Progress - Environmental Ethics:** This course was the last module of a 7 module program called Professional Progress put together in a cooperative effort between First Coast Manufacturer's Association (FCMA) and DEP called Professional Progress. The course included many environmental professionals from many diverse occupations. This full day workshop included the following subjects on the agenda: Environmental Law Enforcement – DEP Law Enforcement Division, Stewardship – The Green Trail Team Project, Environmental Law and Ethics associated with the Timucuan Preserve, the GTM Research Reserve and field components using the trail system.



Sustaining public use requires careful monitoring to ensure the quality of the environment is not degraded.

24. **Green Lodging Workshop 2007: (64+ participants)** Through this rapidly growing program DEP encourages the lodging industry to conserve and protect Florida's natural resources. The Florida Green Lodging Program is unique in that it covers an all-inclusive list of environmental initiatives that are specific to protecting and preserving Florida's environment. This became a high priority item when Florida Governor Crist issued EXECUTIVE ORDER 07-126: "Leadership by Example: Immediate Actions to Reduce Greenhouse Gas Emissions from Florida State Government". Section 4 of Executive Order 07-126 states: "Effective January 1, 2008, state agencies and departments under the direction of the Governor may not contract for meeting and conference space with hotels or conference facilities that have not received the DEP's 'Green Lodging' program designation for best practices in water, energy, and waste efficiency standards, except when certified to the Governor by the responsible agency head that no other viable alternative exists.
25. **The Northeast Florida Coastal Habitat Restoration Workshop: (67 participants)** The GTM Research Reserve in partnership with NOAA, St. Johns River Water Management District, U.S. Fish and Wildlife Service, Florida Inland Navigation District, Florida Fish and Wildlife Conservation Commission and the Nature Conservancy for a one day workshop on Wednesday October 17, 2007. Agencies on the federal, state and local level presented on: available grant funding opportunities, technical resources, and coastal restoration capabilities.
26. **PRIMER-6 Software Package Training:** PRIMER 6 (Plymouth Routines In Multivariate Ecological Research) consists of a wide range of univariate, graphical and multivariate routines for analyzing the species/samples abundance (or biomass) matrices that arise in biological monitoring of environmental impact and more fundamental studies in community ecology, together with associated physicochemical data.
27. **Matanzas Inlet Workshop: (97 participants)** The GTM Research Reserve, in partnership with NOAA, St. Johns River Water Management District, Florida Inland Navigation District, The University of Florida and the South Anastasia Communities Association hosted a one day workshop on Wednesday November 14, 2007. This workshop brought diverse expertise together for a comprehensive discussion of the Matanzas Inlet System (the last natural inlet in northeast Florida) in

terms of the physical and biological state of knowledge (and gaps therein) related to understanding the implications of dredging operations in the vicinity by the Florida Inland Navigation District.

28. **2nd Annual Northeast Florida Symposium on Maritime Archaeology: (Averaged approximately 80 participants per day)** Hosted by the GTM Research Reserve in partnership with the St. Augustine Lighthouse Archaeological Maritime Program, Inc. (LAMP), NOAA, The Florida Public Archaeology Network, Florida Division of Historical Resources, St. Johns County and the St. Augustine Archaeological Association. The symposium covered a host of topics including maritime archaeological sites in the GTM Research Reserve, pre-historic underwater archaeology, the archaeology of several shipwreck sites in Florida, agency jurisdictions of submerged cultural resources, international shipwreck projects and graduate student archaeological research projects.
29. **National Heritage Area Public Workshop and Public Meeting:** This meeting was conducted in coordination of the NHA local partners, the GTM Research Reserve, St. Augustine Lighthouse and Museum, Lighthouse Archaeological and Maritime Program (LAMP) and St. Johns County. A “national heritage area” is a place designated by the United States Congress where natural, cultural, historic and recreational resources combine to form a cohesive, nationally-distinctive landscape arising from patterns of human activity shaped by geography.

The GTM Research Reserve’s Coastal Training Program has had a significant increase in participants since its inception (Table 5.). Future Coastal Training Program development and direction will be based on the program’s strategic documents which include issue/topic based needs assessments, Planning documents and the evaluations of CTP will inform reserve staff of the priority issues, technology needs, and preferred training delivery and logistics of coastal decision makers.

Table 5 / Numbers of participants in coastal training program workshops.

Fiscal year	Participants in CTP
2005 - 2006	342
2006 - 2007	235
2007- 2008	718



The GTM Research Reserve is actively monitoring exotic non-native invasive species and managing through practices of eradication to ensure biological diversity.

Chapter Six

Issues

GTM Research Reserve Mission Statement: To achieve the conservation of natural biodiversity and cultural resources by using the results of research and monitoring to guide science-based stewardship and education strategies.

6.1 / Introduction to Issue-Based Management

The hallmark of the National Estuarine Research Reserve (NERR) program is that each reserve's management efforts are in direct response to, and designed for unique local and regional issues. The issues most relevant to the GTM Research Reserve can be categorized under five topic headings: 1) Public Use, 2) Habitat and Species Management, 3) Watershed Landuse, 4) Cultural Resource Preservation and Interpretation, and 5) Global Processes. These topics were identified based on input from the Reserve's Management Advisory Group, staff, volunteers, the general public, and other stakeholders over the two-year planning process leading to this plan.

To meet the challenges of an identified issue a research reserve integrates ecosystem science, education and outreach, and resource management strategies to achieve measurable objectives (Figure 21). For example, a reserve may address declines in water clarity (issue) by first setting a measurable objective (improve water clarity), then studies are used to identify causes and potential solutions (e.g., ascertain links between stormwater runoff and water clarity; an ecosystem science strategy), planting eroded shorelines with marsh vegetation to create a natural buffer (a resource management strategy), creating a display or program on using native landscaping to encourage reduced fertilize use (an education and outreach strategy). Continued monitoring of water clarity allows the reserve to evaluate progress toward the objective (performance measures) and, if needed, adaptively adjust the strategies to achieve this objective.

Management strategies in this plan have been categorized as either core or secondary. Core strategies are those for which the GTM Research Reserve staff will actively devote existing resources, and pursue additional funding and partnerships to accomplish. Secondary strategies are beyond our current abilities but will be accomplished as partnerships or other opportune funding sources become available.

Introduction to Issue-Based Adaptive Management

Natural resource management efforts are in direct response to, and designed for, unique local and regional issues.

Challenges of an identified issue are met by integrating research, education and stewardship strategies.

Objectives are measurable.

Continued monitoring allows the reserve to evaluate progress and, if needed, adaptively adjust strategies to achieve the desired objective.



Figure 21 | Issue-based adaptive management.

To be successful the objectives identified in this plan will be accomplished in partnership with local citizens, city, county, state, and federal officials, college and university students and faculty, nongovernmental organizations, and the business community. Strategies are linked to these objectives through performance measures. Strategies can be viewed as tools in a toolbox. It is not necessary to fully implement every strategy as long as the performance measures indicate an objective has been accomplished. Implementation of the strategies identified in this management plan is also dependent upon administrative support for reassigning or otherwise acquiring staff, volunteers, contract services, equipment, training, and supplies. (figure 21)

6.2 / Public Use

Goal: Ensure user experiences are sustainable and consistent with natural and cultural resource protection for the benefit of existing and future generations.

Introduction: Encouraging public use that is compatible with natural and cultural resource protection is a priority of the GTM Research Reserve. The natural and cultural resources of the GTM Research Reserve provide a unique user experience unavailable elsewhere. Consistent with public expectations and the GTM Research Reserve's mission, sustainability will be used as a guiding principle for decisions affecting natural and cultural resources.

The changing demographics of coastal Florida threaten the sustainability of natural resources. The GTM Research Reserve must work cooperatively with stakeholders to ensure information regarding the condition of the resources is known and that this information is used proactively to support compatible public use. Public users of the GTM Research Reserve are considered key stakeholders and primary stewards of its resources. Existing levels of use will be maintained unless research clearly identifies resource damage can be avoided. More intensive or novel activities will be limited to those activities that have a carrying capacity established using scientifically valid methods and to those that can be demonstrated not to conflict with existing user experiences.

Issue One: Need to proactively respond to multiple user conflicts associated with the trail system while sustaining habitat quality

Introduction: In order for the quality of the trail experience to be sustained, the GTM Research Reserve must manage public use to address the needs of the existing and growing human population within its watershed. The GTM Research Reserve is also obliged to anticipate and reduce avoidable user group conflicts and resource damage.

Objective One: Improve trail user satisfaction and sustain habitat quality by anticipating and reducing conflicts between trail users and tracking habitat condition.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Summarize carrying capacity research and user survey results for integration into the GTM Research Reserve's education and stewardship programs.
2. Monitor change in habitat condition immediately adjacent to the trails to detect impacts to natural biodiversity.

Resource Management Strategies:

Core Strategies

1. Work cooperatively with specific user groups to develop and implement a comprehensive trail use plan.
2. Encourage and facilitate additional staff and law enforcement presence on the trails.
3. Develop and install signs to direct different user types to the most appropriate trails.

Secondary Strategies

1. Explore and, if feasible, install traffic calming techniques for the dam and trails used by vehicles to enhance public safety.
2. Explore and, if feasible, develop a trail map that links trails between management units within the GTM Research Reserve.

Education and Outreach Strategies:

Core Strategies

1. Provide part-time seasonal staff to guide and welcome users to enhance the appreciation of the resource and promote stewardship.
2. Design all future signs and brochures using universal symbols.
3. Periodically conduct professionally developed trail user satisfaction surveys.

Secondary Strategies

1. Train staff, volunteers and trail users by conducting a workshop focused on "Reducing User Conflicts within Multiuse Public Lands".
2. Develop and install trail etiquette signs.
3. Publish trail educational opportunities in the local media.

Performance Measures:

1. Trends in trail user satisfaction.
2. Trends in law enforcement citations/incidents.
3. Trends in sensitive species or habitats immediately adjacent to the trails as compared to control sites.
4. Trends in user patterns to assess the number of users by trail type and to detect changes to the distribution of user types.

Issue Two: Need to enhance access on the trail system for users with special needs

Introduction: The natural and cultural resources experience of the GTM Research Reserve should be made more available to users with special needs. Following the lead of other managed natural areas the GTM Research Reserve should strive to enhance accessibility.

Objective Two: Improve accessibility to the trail system and improve educational opportunities for user groups with special needs.

Integrated strategies

Ecosystem Science Strategies:

Core Strategies

1. Maintain and summarize database of visitor use surveys for integration into the GTM Research Reserve's stewardship and education program.

Resource Management Strategies:

Core Strategies

1. Evaluate existing boardwalk design and, if feasible, retrofit to improve amenities for users with special needs.

Secondary Strategies

1. Evaluate and, if feasible, allow low impact vehicles, such as off-road segways on designated trails.
2. Evaluate and, if feasible, obtain kiosk designs that accommodate users with special needs.

Education and Outreach Strategies:

Core Strategies

1. Assess methods used by other "park" and wildlife management areas to improve interpretation programming for users with special needs.
2. In partnership with other environmental educational organizations and agencies, increase educational programming for users with special needs.

Performance Measures:

1. Trends in the use of the trails by visitors with special needs.
2. Results of trail user surveys.

Issue Three: Enhancing compatible use at the dam and the surrounding area

Introduction: The GTM Research Reserve is committed to sustaining the quality of the experience presently realized by all users of this resource. One of the most effective methods of discouraging incompatible use is to encourage compatible use. The GTM Research Reserve will implement strategies to encourage compatible use.

Objective Three: Enhance the amenities associated with compatible public use of the dam and surrounding estuaries.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Summarize user survey information on amenities for integration into the stewardship and education program.

Secondary Strategies

1. Establish photo-points to evaluate boat ramp erosion and other infrastructure damage.

Resource Management Strategies:

Core Strategies

1. Design and, if feasible, implement a solution to boat ramp and walkway erosion.
2. Maintain two weekend year-round gate keepers on staff to increase staff member presence at the dam, to directly communicate with recreational users of this portion to the GTM Research Reserve, to

collect use data for performance measures, to ensure access is not dependent on gate function, and to alert users of parking lot capacity.

Secondary Strategies

1. Identify, implement and maintain paddling trails (guided and self-guided).
2. Use the results of the user survey to prioritize stewardship activities associated with adding amenities to users of the dam and surrounding area.
3. Explore and, if feasible, establish primitive camping sites on spoil islands of the GTM Research Reserve associated with the paddling trail experience.

Education and Outreach Strategies:

Core Strategies

1. Provide a weekend part-time naturalist to conduct guided marsh and trail programs during peak tourist season.
2. Design and conduct a user survey to prioritize implementation of resource compatible amenities and gauge satisfaction.

Secondary Strategies

1. In coordination with the Friends of the GTM Research Reserve conduct outreach programs targeting users of the dam area.
2. Offer training workshops for ecotour operators.
3. Continue to support locally sponsored catch and release kayak fishing tournaments within the GTM Research Reserve boundaries.
4. Conduct multicultural and multilingual conservation workshops.
5. In cooperation with FWC, conduct a locally sponsored kid's fishing tournament (to teach conservation).
6. Evaluate and, if feasible, initiate a compatible food/bait concession at the dam.

Performance Measures:

1. Trends in user satisfaction surveys.
2. Trends in attendance at events.
3. Trends in user numbers accessing the dam and trails.

Issue Four: Need to increase public awareness of the GTM Research Reserve

Introduction: In order to be most effective at achieving conservation of coastal resources, the community surrounding the GTM Research Reserve must be aware of and supportive of its mission. Education and outreach strategies must be dynamic and respond correctly to the changing demographics of the surrounding watersheds. Community feedback and support is an essential component of GTM Research Reserve management. Marketing strategies must emphasize the unique resources of the GTM Research Reserve, promoting sustainable use through stewardship.

Objective Four: Increase public awareness of the GTM Research Reserve and support of its mission.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Develop a GTM Research Reserve Site Profile to summarize existing research information and to identify additional research needs for students and visiting investigators.
2. Provide input into the GTM Research Reserve user guide and an annual "State of the GTM Research Reserve" workshop.

Resource Management Strategies:

Core Strategies

1. Provide input into the GTM Research Reserve user guide and an annual "State of the GTM Research Reserve" workshop.

Education and Outreach Strategies:

Core Strategies

1. Develop a GTM Research Reserve user guide highlighting recreational and educational opportunities within the GTM Research Reserve's entire boundary (partnering and coordinating with all agencies managing natural recreational lands within and adjacent to the GTM Research Reserve boundaries).
2. In partnership with all agencies managing land within the GTM Research Reserve's boundary organize and conduct annual "State of the GTM Research Reserve" workshop providing information to newspapers and other media to inform the local citizenry of the status and trends in species biodiversity, public use, pollution, and habitat conservation.
3. Develop and update a formal marketing plan for the GTM Research Reserve
4. Correct all traffic signs and maps locating the GTM Research Reserve and specific resources.
5. Enhance and update all GTM Research Reserve affiliated Websites (local, State and NERR) as needed.
6. Organize and implement events to highlight the GTM Research Reserve's 10 year anniversary in 2009.
7. Continue to host annual National Estuaries Day and Florida's Birding and Foto Fest.
8. Work in cooperation with St. Johns County Government Television to develop programming that highlights the GTM Research Reserve's resources and issues.

Performance Measures:

1. Completed GTM Research Reserve site profile.
2. "State of the GTM Research Reserve" workshops conducted and attendance.
3. Completed GTM Research Reserve user guide.
4. Correct on signs and publications identifying or describing the GTM Research Reserve.
5. Development and implementation of a formal marketing plan.
6. Attendance at the 10 year anniversary events, Estuaries Day and the Birding and Foto Fest.
7. Hours of government television programming developed.

Issue Five: Need for up-to-date issue-based beach information kiosks and signage

Introduction: The majority of the public visiting the GTM Research Reserve are accessing the beaches. The beach parking lots and access points provide a unique and valuable opportunity for public outreach and education. The GTM Research Reserve will develop and implement strategies to make better use of these locations for future educational programming.

Objective Five: Enhance issue based information at the beach parking lots highlighting the GTM Research Reserve's mission, current resource information (e.g., whale sightings, turtle nests etc) and recreational opportunities.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Summarize beach species monitoring data for integration into the parking lot kiosks and beach nature walks.

Resource Management Strategies:

Core Strategies

1. Explore, and if feasible, conduct native plant dune restoration projects in coordination with educational programming.

Education and Outreach Strategies:

Core Strategies

1. Review existing signage and design new signs and kiosks allowing for dynamic resource updates that provide information on Environmental Education Center (EEC) location, resource issues, and current events within the GTM Research Reserve.



Sustaining habitats and natural biodiversity to support recreational fishing is a high priority for the GTM Research Reserve.

2. Design and conduct user surveys incorporating resource specific questions to test user knowledge of beach habitats and the mission of the GTM Research Reserve.

Secondary Strategies

1. Provide seasonal guided nature walks starting at the beach parking lots.

Performance Measures:

1. Increasing trends in user knowledge of beach habitats and the GTM Research Reserve's mission based on user survey responses.
2. Decreasing trends in unauthorized dune crossovers, beach litter, and sea turtle/bird nest disturbance by humans and their pets.

Issue Six: Unauthorized activities (e.g., artifact collection, plant harvesting, poaching, fishing violations) associated with the trail system

Introduction: Being remote, yet easily accessible, the GTM Research Reserve has an elevated potential for unauthorized artifact collection and plant and animal harvesting. In order to sustain a high quality public use experience and protect the GTM Research Reserve's resources unauthorized activities must be curtailed.

Objective Six: Reduce unauthorized activities associated with the trail system.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Monitor and record data regarding the disturbance of sentinel habitats and cultural resource sites.
2. Summarize disturbance monitoring research results for integration into the GTM Research Reserve's education and stewardship programs.

Resource Management Strategies:

Core Strategies

1. Encourage additional law enforcement patrols.
2. Increase staff time in the vicinity of cultural resources and sensitive natural resources at peak visitor use times.
3. Install enforceable signage to educate trail users of the significance of the area's natural and cultural resources and up-to-date regulations.

Secondary Strategies

1. Explore and, if feasible, initiate the use of remote cameras to monitor sensitive habitats or sites that show signs of unauthorized activities.

Education and Outreach Strategies:

Core Strategies

1. Conduct annual Cultural and Natural Resources Law Enforcement workshops targeting the GTM Research Reserve staff, volunteers, law enforcement officials, and trail users.
2. Develop enforceable signage to educate trail users of the significance of the area's natural and cultural resources and up-to-date regulations.
3. When feasible, include a natural and cultural resources section to trail etiquette signs.
4. Submit information to newspaper and other public media on the topic of cultural and natural resource stewardship and the trail experience.

Secondary Strategies

1. Provide natural resource educational experiences and materials designed for the cultural diversity of our user groups.

Performance Measures:

1. Trends in law enforcement activities and citations.
2. Trends in site disturbance.
3. Trends in user behavior patterns within the trail system.

Issue Seven: Littering and unauthorized paths in the marsh adjacent to the dam

Introduction: Litter and unauthorized trails adversely affect aesthetics and damage marsh habitats. Hooks, broken bottles, monofilament fishing line, fish bones and other trash is also dangerous to people, their pets and wildlife. Resiliency studies have shown that foot traffic can cause long-term damage to marsh habitats. Promoting a "leave no trace" ethic will ensure sustainability of the recreational experience of this area.

Objective Seven: Reduce the daily accumulation of litter at the dam to quantities that can be collected by volunteers and staff to improve public and wildlife safety.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Periodically generate and summarize a dataset that identifies the amount and type of litter generated.

Secondary Strategies

1. Maintain a database of wildlife injury/mortality rates associated with monofilament.
2. Establish fixed photo points in locations subject to excessive littering or marsh habitat damage.
3. Summarize ecosystem science strategies results for integration into the GTM Research Reserve's education and stewardship program.

Resource Management Strategies:

Core Strategies

1. Enforcement of anti-litter laws and habitat protection rules.
2. Increase staff member presence at this high use recreational location.
3. Conduct community/volunteer cleanup days.
4. Maintain monofilament recycling stations.
5. Install signage using universal symbols to ensure clear communication with all user groups.
6. Install wildlife proof trash bins to prevent raccoons from pulling trash out of containers at night.
7. Empty trash containers more frequently to prevent containers from filling.

Secondary Strategies

1. Explore and, if feasible, work with Florida Fish and Wildlife Conservation Commission (FWC) to modify the dam spillway to lessen monofilament line snags.
2. Replant and install interpretive signs in marsh habitat damaged by unauthorized access.

Education and Outreach Strategies:

Core Strategies

1. Design signage using universal symbols to ensure clear communication to all user groups.
2. Staff a part-time naturalist specially trained in rules and common violations to be at the dam during peak fishing times.

Secondary Strategies

1. Develop and implement an outreach program targeting the local fishing community emphasizing the need to “leave no trace”.
2. Develop and implement an “Adopt-a-lot” program for the parking area surrounding the dam.
3. Help to promote/increase awareness of the monofilament recycling program.

Performance Measures:

1. Decreasing trend in litter generated at the dam.
2. Increasing trend in the amounts of voluntarily collected monofilament.

Issue Eight: Need for consistent enforcement of fishing regulations at the dam

Introduction: The GTM Research Reserve will continue the existing hours of public entry into the dam fishing area. Law enforcement records and staff observations indicate that fishing violations increase after sunset. In order to protect the GTM Research Reserve’s natural resources additional scrutiny of the nighttime activities at this location is necessary.

Objective Eight: Reduce the number of fishing regulation violations at the dam between sunset and closing.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Obtain law enforcement activity reports and create a database of fishing regulation violations for integration into the GTM Research Reserve’s stewardship and education program.

Resource Management Strategies:

Core Strategies

1. Increased ranger and law enforcement presence between sunset and closing, and document number of patrols in area for performance measuring.
2. Increase ranger interaction with recreational users between sunset and closing to promote compliance of rules.

Education and Outreach Strategies:

Core Strategies

1. In cooperation with FWC, conduct fishing clinics that emphasize conservation messages targeting users between sunset and closing.

Secondary Strategies

1. Provide up-to-date fishing limits on signs and distribute information to users (e.g., Florida Sportsman's LAWSTICK) that reflect current regulations.

Performance Measures:

1. Decreasing trend in the number of law enforcement citations versus patrols conducted between sunset and closing.

Issue Nine: Beach litter

Introduction: Beach litter is more than aesthetically undesirable; it can actually lead to serious injury of wildlife and beach goers. Unfortunately, as the coastal population grows the amount of beach litter is likely to increase. The user groups, issues and solutions associated with beach litter are significantly different than those associated with the trails and therefore require different strategies. The GTM Research Reserve will work cooperatively with its partners and volunteers to proactively address the beach litter issue.

Objective Nine: Reduce the amount of beach litter and identify the source

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. In coordination with community clean-up events and the International Coastal Clean-up conduct an assessment of litter by type and amount.
2. Summarize the results of these ecosystem science strategies for integration into the GTM Research Reserve's education and stewardship program.
3. Maintain and summarize a beach wildlife injury database.

Resource Management Strategies:

Core Strategies

1. Continue to maintain trash containers and monofilament recycling stations in beach parking lots.
2. Provide additional raccoon-proof trash containers on the beach side of boardwalks to increase likelihood of users to dispose of trash properly.
3. Increase weekend ranger and volunteer presence on the beach to improve compliance and cleanup during patrols.
4. Establish volunteer ranger positions to patrol beaches in morning to pick up trash.

Secondary Strategies

1. Support initiatives to require helium filled balloons to be made of biodegradable plastic and to prohibit intentional open-air releases.

Education and Outreach Strategies:

Core Strategies

1. In cooperation with Flagler and St. Johns counties support an "Adopt a Beach" program.
2. Host community beach clean-up events.
3. Highlight the danger of litter to wildlife in education programs with beach kiosks.
4. Update parking lot signage to reflect the "leave no trace" theme.

Performance Measures:

1. Reducing trends in the quantity the most damaging and preventable beach litter.
2. Reducing trends in the number of litter-associated wildlife injuries.

Issue Ten: Unauthorized beach parking beyond hours of operation having negative effects on sensitive wildlife habitats and public safety

Introduction: It is in the best interest of public safety and habitat conservation to discourage public access to the GTM Research Reserve's beaches outside the normal hours of operation. Due to reduced visibility and remoteness, public safety cannot be ensured after closing. In addition, it is also important to reduce nighttime disturbance of nesting sea turtles, birds, and other species that use the GTM Research Reserve's beaches as critical habitats.

Objective Ten: Reduce disturbance of nocturnal species and sensitive habitats and improve public safety by discouraging parking beyond the hours of operation at the beach parking lots.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Maintain a database of parking violations to track repeat offenders, the numbers of vehicles parked beyond hours of operations by parking lot, overnight habitat damage and law enforcement citations.
2. Summarize data from this database for incorporation into the GTM Research Reserve's stewardship program.

Resource Management Strategies:

Core Strategies

1. Issue warning notices for late parkers, issue tickets with fines, and as a last resort tow vehicles of repeat violators.
2. Explore feasibility of installing automatic gates or pass dispensers at the entrances to the beach parking lots.
3. Install signs at beachside that clearly state that the lot closes at sunset and the penalties for violations.

Secondary Strategies

1. Explore, and if feasible, contract with a security agency or install monitored security cameras.

Education and Outreach Strategies:

Core Strategies

1. Clearly inform the public of the hours of operation and consequences of remaining in the lot after hours (e.g., fines).

Performance Measures:

1. Trends in the number of cars parked beyond the hours of operation and repeat offenders.
2. Trends after hours law enforcement citations at the beach and parking lots.
3. Trends in overnight human disturbance of beach habitats and species.

Issue Eleven: Unauthorized docks and structures within the aquatic preserves

Introduction: Aquatic preserves are protected under Florida law by having special public interest criteria that must be considered as a part of the permit process for docks and other structures. In addition, the aquatic preserves within the GTM Research Reserve are designated as Outstanding Florida Waters. This water quality designation discourages human activities that alter ambient conditions. Through education and outreach the GTM Research Reserve will strive to encourage better stewardship of these important resources and compliance with existing regulations.

Objective Eleven: Improve compliance of future docks with Aquatic Preserve rules.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Conduct or facilitate and review scientific literature examining the impact of docks on benthic community structure.

2. Maintain a database of authorized docks and structures in the GTM Research Reserve's Aquatic Preserves' boundaries.
3. Integrate information from literature reviews into the GTM Research Reserve's education and stewardship program.

Resource Management Strategies:

Core Strategies

1. Ensure that Aquatic Preserve boundaries are known by dock permit applicants and reviewers.
2. Proactively identify projects for meeting public interest criteria linked to the Reserves management plan strategies.
3. Wherever practical post the Aquatic Preserve boundary.
4. Use GIS to identify and document existing and new dock locations relative to the GTM Research Reserve's Aquatic Preserves' boundaries.
5. Track authorized dock permits within the aquatic preserves' boundaries.
6. Determine ownership and post CAMA managed spoil islands within the GTM Research Reserve.
7. Promote the use and distribution of the Aquatic Preserve Rule training video.

Education and Outreach Strategies:

Core Strategies

1. Conduct periodic Aquatic Preserve Rule training workshops for regulatory staff as requested.
2. Conduct dock builder workshops.
3. Encourage comprehensive marine, mooring and dock planning that considers long-term cumulative effects.
4. Provide workshops and technical assistance as requested by county and city governments.

Secondary Strategies

1. Develop an Aquatic Preserve Boat Map and User Guide.
2. Conduct a vista ordinance workshop.

Performance Measures:

1. Reducing trends in the number of unauthorized structures or docks within the Aquatic Preserves.
2. Trends in the development and implementation of comprehensive marina, mooring and dock planning by local governments.

Issue Twelve: Domestic animals on the beach can negatively impact protected species

Introduction: Unleashed dogs or cats are not allowed on the beaches within the GTM Research Reserve (18-23, F.A.C.). Despite this rule there have been many documented cases where unleashed animals have been observed harassing wildlife and damaging dune habitats. The GTM Research Reserve will strive to conserve the sustainability of the beach and dune habitat by proactively discouraging unauthorized activities on these beaches.

Objective Twelve: Reduce damage to beach habitats and instances of wildlife harassment by unleashed domestic animals

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Review and summarize the scientific literature to ascertain the critical alarm distance for nesting birds for various domestic animal activities.
2. Summarize research results for integration into the GTM Research Reserve's education and stewardship program.
3. Maintain and summarize a database of wildlife harassment incidents and habitat damage associated with domestic animals.

Resource Management Strategies:

Core Strategies

1. In cooperation with FWC and other wildlife management agencies encourage consistent enforcement of applicable laws, regulations, and ordinances, particularly during least tern and sea turtle nesting season.
2. Clearly post regulations at all legal crossover locations.
3. Create beach patrol volunteer positions and/or staff to regularly patrol and monitor the beach on the weekend to encourage proper beach etiquette.

Education and Outreach:

Core Strategies

1. Provide up-to-date information on the sensitivity of nesting birds to unleashed dogs and cats (beach signage, educational programming and outreach) using alarm distance research.

Performance Measures:

1. Reducing trends in the number of turtle and least tern nests damaged due to domestic animals.
2. Reducing trends in the number of incidents of wildlife harmed or harassed by unleashed domestic animals.

6.3 / *Habitat and Species Management*

Goal: Improve the conservation of natural biodiversity by implementing the principles of adaptive management and ecosystem science.

Introduction: There is an immediate need to evaluate existing ecosystem science information to establish baseline conditions in order to evaluate and prioritize future management activities. With the exception of nutrients and bacteria and one NOAA National Status and Trends Station, long-term systematic monitoring of pollutants, habitats, and estuarine species has not been initiated in the GTM Research Reserve's boundaries. The initial Guana River Marsh Aquatic Preserve (GRMAP) and Pellicer



The condition of high level predators, such as alligators, provide a useful indicator of the health of the surrounding environment.

Creek Aquatic Preserve (PCAP) management plans include habitat and species inventories (1991) that should be updated. Techniques used for these original inventories are not documented. Because of this the GTM Research Reserve's initial evaluation of changes of biodiversity and habitat will be limited to presence and absence data. It is recommended that subsequent species and habitat data be collected and analyzed using standardized methods that are well documented to allow for more rigorous methods of change detection.

Long-term standardized monitoring is necessary to assess trends in the condition of the GTM Research Reserve's water quality and biological resources. The initiation of the NERR System-wide Monitoring Program (SWMP) represents a significant accomplishment toward this goal however trends in important indicators (e.g., duration of hypoxia, salinity change, turbidity) requires data analyses and interpretation on an annual cycle. In order to fully characterize the GTM Research Reserve's natural resources and fulfill its mission additional monitoring and modeling capabilities will be necessary. Existing datasets should be analyzed for trends and used to guide future monitoring locations and protocols.

Ideally, biological monitoring should focus on multiple trophic levels (e.g., phytoplankton, zooplankton, macroinvertebrates, fishes, and marine mammals) and habitats incorporating measures of both species/habitat biodiversity and condition. Predictive models must also be developed that link management activities to outcomes in order to guide future decisions. Equally important is an integrated educational and resource management strategy to interpret the results of research and modeling to coastal decision makers and stakeholders implementing restoration/conservation planning.

Given appropriate resources, the GTM Research Reserve will strive to initiate and implement a science-based adaptive management strategy consistent with the following process: (1) characterization of the problem, (2) diagnosis of causes, (3) identification and implementation of management strategies, (4) assessment of the effectiveness of these strategies, (5) re-evaluation of causes, and (6) continued assurance of effectiveness and, if necessary, the refinement of strategies. To be successful each step of this process must be fully integrated with the GTM Research Reserve's education and stewardship programs. This scheme will create the cycle of management necessary to identify, solve, correct, and follow trends in ecosystem integrity.

Monitoring strategies for listed species will be in accordance with approved recovery plans. Opportunities for partner agencies within the GTM Research Reserve to coordinate efforts to enhance limited resources will be actively encouraged.

Submerged and Tidal Communities

The GTM Research Reserve submerged habitats are not well characterized. Lack of appropriate baseline information regarding habitats and species composition (native and exotic) is an overriding issue which limits the GTM Research Reserve's effectiveness to manage its resources. Therefore the objectives listed below prioritize the establishment of an up-to-date baseline inventory of habitats and species and development of protocols for conducting change analyses and predictive modeling. To complement these efforts, the GTM Research Reserve will also acquire information concerning the status and trends in recreational and commercial fisheries within its boundary.

Issue Thirteen: The absence of baseline maps for submerged and tidal habitats precludes informed decisions concerning resource condition or trends

Introduction: Establishing long-term baseline mapping of the GTM Research Reserve's habitats is necessary to track short-term variability and long-term trends. The ultimate goal of this endeavor is to conduct change analyses. Habitat change monitoring is necessary to set management priorities and to assess the resiliency of the GTM Research Reserve's habitats.

Objective Thirteen: Develop a habitat map for the GTM Research Reserve's tidal and submerged resources to support change analyses.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Conduct or facilitate research to map submerged habitat sediment grain size, bathymetry, hard-bottom resources and tidal marsh to serve as baseline for future change analyses and habitat suitability modeling efforts.

2. Summarize research results for integration into the GTM Research Reserve's education and stewardship program.
3. Continue existing and develop new partnerships with other agencies and universities to accomplish benthic mapping needs of this region.
4. Assist the Friends of the GTM Reserve and other partners in pursuit of grants to help fund and administer positions for conducting research and resource management projects.

Resource Management Strategies:

Core Strategies

1. Provide GIS and GPS support for habitat mapping and ground truthing.
2. Use the results of habitat change analyses to guide and assess the GTM Research Reserve's restoration activities.

Education and Outreach Strategies:

Core Strategies

1. Incorporate habitat change information as it becomes available into educational programming and outreach materials.
2. Conduct workshops on tidal and submerged habitat mapping and change technologies.
3. Incorporate the results of the GTM Research Reserve's habitat change assessment into an annual "State of the GTM Research Reserve" workshop.

Performance Measures:

1. The percent area mapped by coverage type.
2. An accuracy assessment of data generated from mapping effort.
3. Initiation and implementation of mapping projects for trend analysis.

Issue Fourteen: Establishing long-term baseline information regarding estuarine and oceanic species composition

Introduction: Establishing long-term biological monitoring of composition of estuarine and oceanic species will allow the GTM Research Reserve to track short-term variability and long-term trends. As with habitat mapping, the ultimate goal of this endeavor is to conduct change analyses and to use the information to set future management priorities. Initially the scope of this activity will be limited to presence and absence data obtained from existing sources. The GTM Research Reserve will seek opportunities to expand on this dataset through partnerships that support long-term biological monitoring.

Objective Fourteen: Initiate long-term biological monitoring of estuarine species composition (including nonnative species) to support change analyses of the GTM Research Reserve estuarine biodiversity.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Facilitate or conduct projects to initiate long-term biological monitoring at multiple trophic levels within selected habitats.
2. Facilitate or conduct creel census or otherwise obtain data related to the GTM Research Reserve's recreational and commercial fisheries productivity to follow and report on trends in species biodiversity, biomass and abundance.
3. Summarize research results for integration into the GTM Research Reserve's education and stewardship program

Secondary Strategies

1. Scuba or remote-sensing based resource inventory of offshore area of GTM Research Reserve to document natural communities and species composition.

Resource Management Strategies:

Core Strategies

1. Provide GIS and GPS support for habitat biological monitoring.

Education and Outreach Strategies:

Core Strategies

1. Incorporate biodiversity information as it becomes available into educational programming and outreach materials.
2. Conduct workshops on GIS modeling to support conservation of biodiversity.
3. Provide training opportunities to staff and volunteers for recording, managing and analyzing trends in ecological datasets.

Performance Measures:

1. Number of long-term monitoring projects initiated.
2. Number of samples collected or surveys completed.
3. GIS products produced that support habitat change initiatives.

Issue Fifteen: Damage to salt marsh habitats by unauthorized access of vehicles along the Tolomato River

Introduction: Salt marsh habitats are extremely sensitive to off-road vehicle traffic. It takes only one off-road vehicle incident to cause long-term damage to salt-marsh vegetation. The best strategy for conservation is prevention, however, once damage has occurred restoration can be used to accelerate the recovery of affected marshes.

Objective Fifteen: Reduce the frequency of off-road vehicle damage and restore damaged salt marsh habitat along the Tolomato River.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Facilitate or conduct research and summarize published literature on salt marsh resiliency to physical damage.
2. Summarize information from GTM Research Reserve affiliated research projects and literature reviews for integration into its education and stewardship program.
3. Establish a photo-point database of off-road vehicle damage and habitat recovery projects by location.

Resource Management Strategies:

Core Strategies

1. Report any unauthorized vehicle activities harming salt marsh habitat within the GTM Research Reserve to the appropriate regulatory and enforcement agency.
2. When feasible, fence, post, and re-vegetate unauthorized access points.
3. Provide GIS support to track damage by unauthorized vehicles.
4. Conduct regular staff or volunteer patrols, including aerial, water, and terrestrial surveys, to monitor for vehicle and other damage.

Education and Outreach Strategies:

Core Strategies

1. Provide information concerning marsh habitat resiliency through displays, fact-sheets, posters, K-12 programming, and public outreach activities.
2. Produce press releases for newspapers about the issue and its ecological effects.
3. Partner with homeowners associations and ATV distributors to promote awareness of marsh habitats and their sensitivity to vehicle traffic.

Secondary Strategies

1. Develop posters and kiosks for education centers and parks in communities adjacent to marshes explaining damage caused by unauthorized vehicles.

Performance Measures:

1. Trends in patterns or frequency of salt marsh damage attributed to off-road vehicles.
2. Trends in the number of staff/volunteer patrols of salt marsh habitat along the Tolomato River.

Issue Sixteen: Sources, biological significance, and status and trends of pollutants affecting the GTM Research Reserve's habitats and water quality require additional examination

Introduction: Reserves are established to serve as platforms for research and education to understand natural coastal processes and to generate information to enhance our ability to manage natural resources. Pollutants have a direct and deleterious impact on this purpose. A fundamental need is to restore and maintain natural estuarine conditions to the fullest extent possible. The GTM Research Reserve will partner to facilitate and conduct research necessary to understand the status, trends and biological significance of pollutants to develop management priorities.

Objective Sixteen: Identify the current status, biological significance, and source of water column, sediment and oyster tissue contaminants to support the tracking of long-term changes in the biological significance, source, and trends in water column, sediment and oyster tissue contaminants.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. In partnership with State Universities pursue National Science Foundation's Long-Term Ecological Reserve network status for the GTM Research Reserve to focus additional scientific resources on this issue.
2. Facilitate or conduct modeling and long-term monitoring to identify the current status, biological significance, source, and trends in water column nutrient concentrations and sediment and oyster tissue pesticide, PAH, and heavy metal concentrations.
3. Support continuation and full implementation of the NERR System-Wide Monitoring Program (SWMP).
4. Conduct or facilitate monitoring along suspected pollutant gradients affecting the GTM Research Reserve (e.g., Ponte Vedra Lake drainage system, headwaters of Pellicer Creek, Tributaries of the Tolomato and Matanzas Rivers).
5. Use SWMP datasets to examine indicators of estuarine health such as duration of hypoxia, salinity change, turbidity, and nutrient concentrations.
6. Assist the Friends of the Reserve and other partners in pursuit of grants to help fund research and monitoring projects.
7. Summarize research results for integration into the GTM Research Reserve's education and stewardship program.

Resource Management Strategies:

Core Strategies

1. Provide GIS and GPS support for water quality and contaminant monitoring.
2. Develop trained volunteer based monitoring programs.
3. Partner with DEP's TMDL (Total Maximum Daily Load) Program, St. Johns River Water Management District (SJRWMD), Florida Department of Agriculture and Consumer Services (FDACS), and St. Johns County Department of Health (DOH) to obtain current data on water body classification affecting oyster harvesting.

Education and Outreach Strategies:

Core Strategies

1. Incorporate water quality and contaminant information as it becomes available into educational programming and outreach materials.

2. Incorporate information regarding pollutant sources, status and trends and potential solutions into an annual “State of the GTM Research Reserve” workshop.

3. Initiate a volunteer based (e.g., Lakewatch) water quality monitoring program for Pellicer Creek and Guana River.

Performance Measures:

1. Number of monitoring programs initiated by pollutant type.
2. Number of biomonitoring tools tested, developed and implemented.
3. Continued implementation of the NERR SWMP.
4. Pollutant sources, status and trends are identified and prioritized.
5. Trends in the duration of hypoxia, salinity change, turbidity, and nutrient concentrations are analyzed and interpreted.

Issue Seventeen: Excessive by-catch associated with fishing at the dam

Introduction: Reducing bycatch is one of the fundamental principles of sustainable fisheries. Species deemed undesirable by humans are food for other fish and crabs that may be economically important. Excessive by-catch can also accumulate at the Guana River Dam thereby reducing the aesthetics of the experience for other users. The GTM Research Reserve will implement strategies to reduce by-catch to protect the sustainability of the fisheries at this site and to improve the overall user experience.

Objective Seventeen: Reduce mortality of by-catch associated with fishing activities at the Guana River Dam.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Conduct periodic surveys to monitor the amount and type of by-catch
2. Summarize by-catch monitoring results for integration into the GTM Research Reserve’s education and stewardship program.

Resource Management Strategies:

Core Strategies

1. Identify and obtain local sponsorship for circle hook promotions.
2. Estimate and record by-catch disposal at the dam through periodic patrols at the dam and during clean-ups.
3. Increase staff/volunteer presence at the dam to promote compliance and encourage the release of by-catch.
4. Promote catch and release fishing activities.

Secondary Strategies

1. Establish a volunteer ranger program trained in current fishing regulations and catch and release techniques.

Education and Outreach Strategies:

Core Strategies

1. Provide educational material on the ecological importance of by-catch.
2. Promote the use of circle hooks in cooperation with FWC.

Secondary Strategies

1. Partner with local fishing groups/Sea Grant/FWC to conduct catch and release fishing clinics.

Performance Measures:

1. Trends in by-catch at the Guana River Dam based on the clean-up dataset.



Prescribed fire is a tool used by the GTM Research Reserve's Resource Management Team to conserve natural biodiversity and prevent uncontrolled wildfires.

Issue Eighteen: Sustainability of commercial and recreational fisheries resources at the dam

Introduction: The dam across the Guana River has altered this estuarine system. Typically, the upper reaches of an estuary serve as a refuge from predators for juvenile fishes and crabs. Periodic up-river overflow of water at the dam carry juvenile and larval fish, shrimp, and crabs into the impoundment. During this event, adult fish and crabs previously trapped above the impoundment migrate to the dam to feed on the migrating prey items.

Although this event produces a desirable fishing opportunity for local anglers, there is no scientific information regarding the long-term sustainability of this phenomenon. The GTM Research Reserve will strive to facilitate and conduct research to understand this complex interaction and make management recommendations that will ensure sustainability of the fishery while meeting the goals of the FWC managed Wildlife Management Area.

Objective Eighteen: Achieve measurable progress toward resolving issues concerning the sustainability of the commercial and recreational fisheries at the dam to ensure spillway management support the sustainability of the commercial and recreational fisheries at the dam.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Facilitate or conduct long-term monitoring of the Guana Estuary fish and shellfish populations and water quality conditions on either side of the Guana River Dam especially during spillway water releases and up-river overflow events.
2. Summarize monitoring results for integration into the GTM Research Reserve's education and stewardship program.

3. Obtain summary reports, and if feasible raw data, from all past fisheries monitoring efforts at the GTM Research Reserve.

Resource Management Strategies:

Core Strategies

1. Encourage enforcement of up-to-date fishing regulations by increased patrols of ranger and law enforcement staff.
2. Obtain and maintain records of catch statistics of commercial species caught at the dam.

Education and Outreach Strategies:

Core Strategies

1. Conduct a workshop on the status and trends of local recreational and commercially important fisheries.
2. Promote catch and release recreational fishing experiences.

Secondary Strategies

1. Partner with local fishing groups/Sea Grant/FWC to conduct catch and release fishing clinics and to distribute educational information regarding sustainable fisheries.

Performance Measures:

1. Trends in catch rates, size, and biomass by species.
2. Initiation of monitoring programs.
3. Species and water quality below and above the dam are not significantly different or altered by spillway management.

Issue Nineteen: Need for improved public awareness of the GTM Research Reserve and its mission relative to oceanic habitats

Introduction: The GTM Research Reserve has direct management responsibility for twenty-five thousand acres of oceanic habitat as part of the GRMAP. Public awareness and involvement in the long-term management and conservation of this resource is fundamental to its protection.

Objective Nineteen: Increase activities to explain the GTM Research Reserve's mission to the general public and to pursue partnerships with the offshore recreational and commercial fishing community to ensure the GTM Research Reserve's mission is understood and appreciated.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Facilitate research to map seafloor habitats.
2. Facilitate right whale research projects.
3. Facilitate underwater archaeological surveys.
4. Summarize research, surveys, and monitoring results for integration into the GTM Research Reserve's education and stewardship program.

Secondary Strategies

1. Facilitate NOAA monitoring buoy expansion.
2. Staff or volunteers record catch and bycatch as observers aboard recreational or commercial vessels within the GTM Research Reserve's oceanic habitat.

Resource Management Strategies:

Core Strategies

1. Confirm the GTM Research Reserve boundaries are accurately depicted on offshore navigational charts.
2. Increase the GTM Research Reserve's staff presence within its oceanic habitats.

3. Obtain and maintain records of catch statistics of commercial species caught within the Reserves oceanic habitat for use in the GTM Research Reserve's education and research program.
4. Provide GIS support for ocean mapping projects.
5. Work cooperatively with FWC to report encroachment by shrimp boats within legal state limit offshore.

Secondary Strategies

1. Identify potential user issues/conflicts relating to the GTM Research Reserve's ocean habitat.

Education and Outreach Strategies:

Core Strategies

1. Increase the GTM Research Reserve's involvement with the Clean Boater Program and Clean Marina partnership program.
2. Increase the GTM Research Reserve's staff presence at offshore fishing tournaments, boat shows and similar events.
3. Interpret the GTM Research Reserve's oceanic habitat and fisheries resources through displays, fact-sheets, posters, K-12 programming, and public outreach activities.
4. Incorporate Ocean Literacy Standards into education programs.

Secondary Strategies

1. Connect to the fishing community through FWC's circle hook program.
2. Design and implement user surveys targeting boat shows and fishing tournaments.

Performance Measures:

1. The location and boundaries of the GTM Research Reserve are labeled correctly on navigation charts (including GPS charts).
2. Trends in attendance at GTM Research Reserve hosted functions targeting coastal ocean audiences and contact hours for GTM staff and volunteers at boat shows and fishing tournaments.
3. Oceanic resources are quantified and mapped.

Uplands and Freshwater Communities

The uplands and freshwater habitats of the GTM Research Reserve have a long history of manipulation by humans. Despite this disturbance, these habitats are inhabited by a biologically diverse assemblage of flora and fauna. The active management tools available to GTM Research Reserve staff for affecting the biodiversity of these habitats are prescribed fire, mechanical manipulation of vegetation, exotic species control, re-vegetation, and hydrologic restoration.

Details of the goals, strategies and objectives of the GTM Research Reserve's CAMA managed lands prescribed fire program by habitat type and invasive species plan can be found in the appendices. The GTM Research Reserve will actively pursue opportunities to coordinate partnering agencies within the GTM Research Reserve to fulfill the resource conservation objectives identified in these plans.

Issue Twenty: Improved integration of the GTM Research Reserve's stewardship, research, and education teams to support its prescribed fire program

Introduction: Prescribed fire is an important tool that is used by the GTM Research Reserve's resource management team to maintain and restore pyrogenic habitats. Public awareness of the benefits of an active prescribed fire program is essential to ensure public acceptance of the short-term inconveniences such as smoke and road closure. The GTM Research Reserve staff is also committed to applying scientific monitoring to understand the implications of its fire management program on habitats and species composition.

Objective Twenty: Achieve measurable progress towards integrating the GTM Research Reserve's education, research, and stewardship program to more effectively reduce hazards associated with past fire suppression, maintain natural fire ecology of pyrogenic habitats and to use fire as a tool to restore the natural succession of rare habitats or to support listed species recovery efforts.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Conduct systematic monitoring of species composition (plants and animals) within experimental plots with an emphasis on the effects of fire on listed species and overall biodiversity.
2. Conduct and facilitate research to evaluate methods of restoring the natural biodiversity and microclimate of coastal strand habitat.
3. Summarize research results for integration into the GTM Research Reserve's education and stewardship program.
4. Repeat the gopher tortoise burrow census and conduct change analyses to document the distribution and trends in this keystone species.

Resource Management Strategies:

Core Strategies

1. Establish plots within pyrogenic habitats to serve as long-term research sites.
2. Establish mechanical removal versus fire treatment plots within the GTM Research Reserve coastal strand habitat.
3. Conduct other activities as indicated in the GTM Research Reserve's prescribed fire plan.
4. Maintain and procure adequate and reliable equipment and ensure staff is adequately trained to implement the GTM Research Reserve's prescribed fire program.
5. Pursue continuing staff training on current DEP standards for prescribe fire implementation.

Education and Outreach Strategies:

Core Strategies

1. Interpret the GTM Research Reserve's prescribe fire program through displays, fact-sheets, posters, K-12 programming (Fire in Florida's Ecosystem), and public outreach activities.
2. Deliver fire ecology programming to communities in high fire hazard areas adjacent to the GTM Research Reserve.

Performance Measures:

1. Acres of fire hazard reduced.
2. Acres of habitats restored.
3. Acres of habitats sustained in a prescribed successional rotation.
4. Sustained natural biodiversity and enhanced listed species abundance.

Issue Twenty-one: Improved integration of the GTM Research Reserve's stewardship, research, and education components of its invasive species control program

Introduction: Displacement by exotic species is considered to be the second greatest threat to worldwide natural biodiversity. Lessons learned by exotic species research indicate that the most cost-effective strategies for responding to this threat are early detection and prevention. Global warming will likely cause a range expansion of tropical and subtropical species. The GTM Research Reserve's location makes it particularly vulnerable to invasion by species established in south Florida. Several invasive exotic species, such as Brazilian pepper (*Schinus terebinthifolius*) and Australian pine (*Casuarina sp.*), are already found in surrounding landscapes but not yet established in the GTM Research Reserve. Diligence is necessary to ensure that these and other invasive exotic species do not become established in the GTM Research Reserve.

Objective Twenty-One: Achieve integration of the GTM Research Reserve's education, research, and stewardship program to more effectively control and, if possible, to eradicate Exotic Pest Plant Control Council (EPPC) category I and category II invasive exotic species within CAMA managed lands.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Monitor changes in natural biodiversity in sensitive habitats.
2. Monitor for new and established exotic species.

3. Summarize ecosystem science strategy results for integration into the GTM Research Reserve's education and stewardship program.

Resource Management Strategies:

Core Strategies

1. Proactively respond to new exotic species invasions.
2. Control existing invasive species consistent with state and federal protocol to minimize non-target damage.
3. Build and maintain an exotic species GIS database.

Education and Outreach Strategies:

Core Strategies

1. Interpret the GTM Research Reserve's invasive species control program through displays, fact-sheets, posters, K-12 programming, and public outreach activities.
2. Deliver invasive species ecology programming to communities adjacent to the GTM Research Reserve and encourage native landscaping.
3. Facilitate and support Florida Friendly Yards and native plant landscaping programs within the GTM Research Reserve and surrounding watershed communities.

Secondary Strategies

1. Serve as a clearinghouse concerning information relating to estuarine-based exotic species.

Performance Measures:

1. Area or number of non-native species removed.
2. Decreasing trend of ecological impact from non-native species as measured by loss of sentinel native species.
3. The GTM Research Reserve's CAMA managed habitats have fewer invasive species than adjacent unmanaged landscapes.

Issue Twenty-Two: Dune habitat loss due to illegal crossovers

Introduction: Within the GTM Research Reserve, dune habitats are critical for several listed species. Dunes not only benefit wildlife, they are essential barriers to storm surge associated with coastal storms. These habitats are particularly sensitive to foot traffic from humans and pets that access the beach across unauthorized points along the highway. Once established a crossover can be eroded by winds and destabilize adjacent areas. The GTM Research Reserve maintains beach access using several elevated boardwalks that safely allow beachgoers to access the waterfront with minimal disturbance to the dune system.

Objective Twenty-Two: Reduce illegal dune crossovers and substantially restore impacted dune vegetation by limiting beach access to authorized dune crossovers and by restoring dunes damaged by unauthorized access.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Establish photo points to document unauthorized dune crossovers and to assess the success of dune restoration projects.
2. Summarize research results for integration into the GTM Research Reserve's stewardship and education program.

Secondary Strategies

1. Examine trends and patterns in unauthorized dune crossovers.
2. Track restoration progress using photo-points.



The GTM Research Reserve serves as a clearinghouse for science-based information on coastal processes to guide informed decisions by the local community.

Resource Management Strategies:

Core Strategies

1. Increase staff and law enforcement patrols along State Road (SR) A1A.
2. Fence, re-vegetate, and irrigate all unauthorized dune crossovers until restored to a natural or stable condition.
3. Provide GIS support for dune restoration and monitoring projects.

Education and Outreach Strategies:

Core Strategies

1. Interpret the GTM Research Reserve dune habitat restoration program through displays, fact-sheets, posters, K-12 programming, and public outreach activities.
2. Deliver dune ecology programming to communities adjacent to the GTM Research Reserve and users of the beach.

Performance Measures:

1. Reducing trends in unauthorized dune crossovers as measured by systematic photo point monitoring.
2. Numbers of crossovers restored in dune habitats.

Issue Twenty-Three: Fire suppression and hydrologic alterations have reduced natural biodiversity of the GTM Research Reserve's freshwater depression marsh habitat

Introduction: Freshwater depression marshes are a rare habitat in present day Florida. The area that is now the GTM Research Reserve once contained many more acres of this habitat. Mosquito ditching and other hydrological alterations, along with fire suppression, have reduced the extent of freshwater depression marsh habitat. In an effort to conserve natural biodiversity the GTM Research Reserve will restore this habitat and monitor its recovery.

Objective Twenty-Three: Restore natural hydrologic cycle and fire ecology to the GTM Research Reserve's depression marsh habitats within the CAMA managed area.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Monitor and prepare reports concerning the hydrology of the restored freshwater depression marsh habitat.
2. Monitor and prepare reports relating to biodiversity of the restored freshwater depression marsh habitat.
3. Summarize research results for integration into the GTM Research Reserve's education and stewardship program.

Secondary Strategies

1. Facilitate or conduct laboratory studies on the non-target effects of mosquito control on non-target arthropod and amphibian populations within the freshwater depression marsh habitat.

Resource Management Strategies:

Core Strategies

1. Use prescribed fire and vegetation removal to restore depression marsh habitats.
2. In cooperation with FWC, fill ditches and restore hydrologic connectivity of the GTM Research Reserve's freshwater marsh system.
3. In cooperation with the Anastasia Mosquito Control District, ensure wildlife compatible methods of mosquito control are incorporated into the restoration plan.
4. If feasible, reintroduce stripped newts and other compatible species to the restored depression marsh habitat in accordance with approved species recovery plans.

Education and Outreach Strategies:

Core Strategies

1. Interpret the GTM Research Reserve's depression marsh restoration program through displays, fact-sheets, posters, K-12 programming, and public outreach activities to highlight its resource management efforts.
2. Deliver depression marsh ecology and restoration education programs to communities adjacent to the GTM Research Reserve and users of the trail system to promote community restoration and stewardship projects.

Performance Measures:

1. Results of hydrologic and biological monitoring indicate restoration objectives were met.
2. Acres of depression marsh habitat restored.

Issue Twenty-Four: Direct human-related disturbance of sea turtle and least tern nesting habitats within beach and dune habitats

Introduction: Unintentional disturbance of listed species by human activities requires continual evaluation. This issue is focused on direct human interactions with listed species and habitats. The cumulative impact of many brief disturbances can cause nesting birds to abandon their nests. Relocating sea turtle nests associated with beach re-nourishment activities may cause subtle changes in turtle behavior. The GTM Research Reserve will incorporate existing and future research results into its stewardship and educational programs to address this issue.

Objective Twenty-Four: Reduce disturbance of sea turtle and least tern nesting habitats by human activities

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Conduct or facilitate research to establish protocols for evaluating disturbance.
2. Establish baseline conditions for this evaluation protocol.
3. Continued sea turtle and least tern monitoring of CAMA managed beaches.

4. Summarize research results for integration into the GTM Research Reserve's education and stewardship program.

Secondary Strategies

1. Facilitate or conduct research to investigate the impacts of nest relocation on hatchling behavior.

Resource Management Strategies:

Core Strategies

1. Install walkover and parking lot signage at beach access locations.
2. Develop a GIS database that identifies sea turtle and least tern nesting sites.
3. Install updated beach parking lot kiosks that alert beach goers to the current status of nesting turtles and birds.
4. Train volunteers to assist with field monitoring programs and to serve as beach ranger courtesy officers.
5. In cooperation with FWC and other wildlife management agencies encourage consistent enforcement of applicable laws, regulations, and ordinances affecting nesting, resting or foraging shorebirds and nesting sea turtles.
6. In cooperation with FWC and other wildlife management agencies develop a plan to coordinate management of nesting, resting or foraging shorebird habitat.

Education and Outreach Strategies:

Core Strategies

1. Interpret beach ecology through displays, fact-sheets, posters, K-12 programming, and public outreach activities.
2. Initiate beach nature walks on weekends during peak tourist seasons.
3. In cooperation with local property managers and owners, continue to develop and distribute new owner and tenant beach stewardship packets.
4. Design up-to-date seasonal beach and parking lot educational kiosks.
5. Recruit volunteers to assist with field monitoring programs.

Performance Measures:

1. Increasing trends in the success of nesting sea turtle and least tern populations.
2. Decreasing trends in the observations of incidents of nest site disturbance by humans.

Issue Twenty Five: Excessive beach lighting during sea turtle nesting season

Introduction: Disorientation from artificial lighting can lead to the death of sea turtle hatchlings. These hatchlings have an inborn tendency to move in the brightest horizon. On a natural beach, the brightest direction is most often the open view of the night sky over, and reflected by, the ocean. Hatchlings also tend to move away from darkly silhouetted objects associated with the dune profile and vegetation. Because any visible light from an artificial source can cause problems, the most reliable "instruments" to use when making judgments about problem lighting are the eyes of a human observer on the nesting beach. Any light source producing light that is visible from the beach is likely to cause problems for nesting sea turtles and their hatchlings.

Objective Twenty-Five: Reduced wildlife impacts due to artificial lighting to non-detectable levels.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Summarize research information regarding hatchling disorientation and beach lighting for integration into the GTM Research Reserve's stewardship and education program.

Resource Management Strategies:

Core Strategies

1. Support and facilitate local community based beach lighting patrol programs for the beaches directly managed by CAMA.

Education and Outreach Strategies:

Core Strategies

1. Provide USFWS light switch stickers and other information in new home owner/ renter welcome packets.

Secondary Strategies

1. Support the International Dark Skies Initiative (IDSI) (e.g., host Star Parties for the local chapter).
2. Recruit volunteers to support a community based beach lighting patrol program for the beaches directly managed by CAMA and in coordination with St Johns County lighting officer.
3. Offer sample ordinances and workshops for local governments (IDSI).

Performance Measures:

1. Reducing trends in beach lighting violations.
2. Reducing trends in hatchling disorientation due to artificial light.

Issue Twenty-Six: Beach erosion

Introduction: Beach erosion can have a negative effect on beachfront property as well as on wildlife that depend on beach and dune habitats for survival. In order to understand this issue in an ecosystem context it is important to consider large-scale processes and to focus beyond specific stretches of coastlines. Ensuring long-term survival of dune and beach dependent species requires careful management of beach habitats and careful consideration of alternatives for beach habitat management. Past experience has shown that a “quick fix”, such as shoreline stabilization with jetties, can cause greater erosion and loss of adjacent habitats in the long-term.

Objective Twenty-Six: Serve as a clearinghouse of information concerning beach processes to guide decisions affecting local beach renourishment, inlet management, and stabilization projects.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Summarize existing research information regarding coastal processes, inlet management and beach erosion from GTM Research Reserve affiliated workshops for integration into its education and stewardship program.
2. Facilitate research to analyze beach profile data from the DEP Bureau of Beaches and Coastal Systems and the Army Corps of Engineers to determine erosion rates and long-term effects of sea level rise.
3. Facilitate research to conduct finer time-scale profile measurements of the GTM Research Reserve beaches.

Resource Management Strategies:

Core Strategies

1. Report any unauthorized shoreline hardening or construction activities harming dune habitat within the GTM Research Reserve to the appropriate regulatory agency.

Education and Outreach Strategies:

Core Strategies

1. Interpret beach processes through displays, fact-sheets, posters, K-12 programming, and public outreach activities.
2. Deliver a coastal processes and beach erosion workshop to communities adjacent to the GTM Research Reserve.
3. Establish a long-term beach profile database from the existing GTM education activities.
4. Deliver a Matanzas Inlet workshop to highlight the rarity of the existence of a non-modified inlet and the dynamic processes that affect this unique inlet.

Performance Measures:

1. Workshop attendance and CTP attendee survey.
2. Beach erosion response plans are based on the best available scientific information.

6.4 / Watershed Landuse

Goal: Reduce the impact of watershed landuse on coastal resources by identifying priority pollutants and encouraging best management practices.

Introduction: To successfully sustain and improve the condition of the GTM Research Reserve's natural resource management strategies must address watershed-scale issues. The primary objective of these strategies is to reduce or prevent nonpoint source pollution from contaminating the GTM Research Reserve's habitats. Increasing coastal populations will require novel approaches to managing watershed landscapes and reducing pollutant loadings to sustain or improve coastal water quality. The GTM Research Reserve will actively encourage, coordinate or facilitate projects that reduce pesticide and fertilizer use, conserve water, encourage renewable energy technologies, promote native landscaping, and preserve land buffering wetlands, watershed flow-ways and shorelines. The GTM Research Reserve will also strive to serve as a demonstration site and a clearinghouse for innovative science-based technologies and methods that support this objective.

Issue Twenty-Seven: There is a need for an improved and coordinated science-based approach to watershed management

Introduction: Much of the GTM Research Reserve's watershed is likely to be developed over the next few decades. The window of opportunity for wise watershed-scale planning is now. Scientists and engineers have research techniques and modeling approaches that are useful in predicting the necessary buffers for protecting water quality and wildlife corridors. The state, county and local agencies have identified impaired waters, in limited cases have identified probable pollutant sources, and have initiated the development of watershed basin or action plans. Implementation of these plans will involve a consolidated effort of government agencies, scientists, engineers, non-governmental organizations, private developers and citizens. Successful strategies must involve these stakeholders and provide solutions that do not infringe on the rights of private property owners or preclude long-term conservation of public trust resources.

Objective Twenty-Seven: Facilitate the development of watershed management plans for the GTM Research Reserve's watersheds that use conservation strategies focused on sustainable ecosystems.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Facilitate or conduct research that identifies watershed flow-ways and adequate buffers that protect water quality, link wildlife corridors and greenways, and promote sustainable landuse practices.
2. Ensure the GTM Research Reserve's monitoring dataset is used by local, regional and State agencies to identify short-term variability and long-term trends in nutrient concentrations, dissolved oxygen, salinity, turbidity, and as an index of eutrophication.
3. Summarize scientific information from GTM Research Reserve and partner affiliated activities and research projects for integration into its education and stewardship program.

Resource Management Strategies:

Core Strategies

1. Provide GIS support for education and training programming targeting coastal decision makers to encourage best management practices for the GTM Research Reserve's watershed as requested.
2. Serve as a demonstration site and a clearinghouse for new technologies and methods that reduce pesticide and fertilizer use, conserve water, encourage renewable energy technologies, and promote native landscaping.
3. Partner with St. Johns County and Flagler County to place signs along highways to identify the boundary of the GTM Research Reserve watershed and to increase public awareness of the connection between landscape and estuary.
4. Partner with St. Johns County, Flagler County and the SJRWMD to map flow-ways, buffers, and storm water runoff entry points into the estuary.
5. Encourage watershed-scale ecosystem management principles are included in the City and County Comprehensive Planning process.

6. Support and encourage land acquisition and less than fee simple conservation programs to encourage science-based strategies guided by sustainable land use concepts in GTM Research Reserve's watershed.

Education and Outreach Strategies:

Core Strategies

1. Deliver a series of workshops focused on proactive watershed- scale conservation and development planning to integrate planning and research efforts by the SJRWMD, DEP, county planners, city planners, universities, major landowners, and concerned citizens.
2. Incorporate the results of these watershed workshops into the GTM Research Reserve's fact-sheets, posters, K-12 programming, and public outreach activities.
3. Explore, and if feasible, implement Non-point Education for Municipal Officials (NEMO) initiatives for the communities in the GTM Research Reserve's watershed.
4. Deliver periodic workshops on green building techniques, green lodging, green marina, renewable energy technologies and other State sponsored programs supporting sustainable landuse practices.
5. Host workshops to encourage land acquisition programs and to explore alternative opportunities including mitigation banking and conservation easements.

Performance Measures:

1. Positive changes in watershed landuse patterns (i.e., Flow-ways, buffers, and wildlife corridors are identified and conserved).
2. Ecosystem-science-based watershed management is included in City and County Comprehensive Plans.
3. The GTM Research Reserve's monitoring dataset is used by local, regional and State agencies to identify short-term variability and long-term trends in nutrient concentrations, dissolved oxygen, salinity, turbidity, and as an index of eutrophication.

Issue Twenty-Eight: Providing environmental education for the residents of the new town of Nocatee

Introduction: The town of Nocatee will adjoin the GTM Research Reserve's northern components western boundary along the Tolomato River. Nocatee has a 25-year projected build out totaling 30,000 to 35,000 people and 14,200 homes, 5 million square feet of commercial and retail space, 270 acres of neighborhood and community parks and nine school sites.

This community will also have significant conservation lands including the Nocatee Greenway, a 4,700-acre network of upland and wetland habitat that provides and protects important wildlife corridors. The greenway will connect the St. Johns River, Durbin Creek, Twelve Mile Swamp, Tolomato River Basin and the Atlantic Ocean and provide migratory corridors for wildlife. It is also planned that this greenway will provide the public with many recreational opportunities such as bicycling, hiking, bird watching, jogging and horseback riding. In addition, 2,400 acres of waterfront buffer, fronting 3.5 miles of the Tolomato River and immediately adjacent to the GTM Research Reserve will be conserved.

This development will alter the GTM Research Reserve's ecology on a watershed scale. The GTM Research Reserve will partner with the planners, developers, home owner associations, and residents of Nocatee to provide education and outreach opportunities that encourage ecological stewardship.

Objective Twenty-Eight: Proactively improve the environmental awareness and stewardship practices of residents of the Town of Nocatee so it may serve as a model of a sustainable coastal community.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. In cooperation with the Hastings Facility for Sustainability, conduct or facilitate research to examine technologies and landscaping alternatives to reduce nonpoint source pollutant runoff.
2. Summarize scientific information from GTM Research Reserve affiliated workshops and facilitated research projects for integration into its education and stewardship program.

Resource Management Strategies:

Core Strategies

1. Apply and demonstrate environmentally compatible landscaping practices at the EEC and if feasible, within the Town of Nocatee.
2. Provide feedback and recommendations for the management of the Nocatee Preserve.

Education and Outreach Strategies:

Core Strategies

1. Facilitate and integrate Florida Native Plant Society and Florida Yards and Neighborhoods (FYN) concepts into the GTM Research Reserve's EEC and educational programming.
2. Deliver "sustainable living" workshops to Nocatee residents and developers.
3. Develop teaching modules catered to Nocatee residents' issues and needs as a model for other communities in northeast Florida.
4. Export lessons learned in sustainable living to other communities.
5. In partnership with the University of Florida Extension program develop a Green-Household and Landscaper Training Certificate Program.

Secondary Strategies

1. Interpret the effectiveness of green practices implemented at the EEC.

Performance Measures:

1. Trends in the number of FYN certified yards established or Green-Household Certificates awarded in the Town of Nocatee.
2. Trends in research projects conducted or facilitated with a nonpoint source pollutant reduction focus.
3. Trends in water-use, fertilizer applied and electricity use in Nocatee.

Issue Twenty-Nine: [The need to continue to support the communities surrounding the southern component of the GTM Research Reserve as a center for environmental education and research](#)

Introduction: The Town of Marineland and surrounding communities have a long history of supporting environmental stewardship, research and education. Guided by the aspirations of this community, the GTM Research Reserve will seek partnerships to foster ecologically sustainable and economically viable solutions that are compatible with this unique locale.

Objective Twenty-Nine: Increase the GTM Research Reserve education, stewardship and research programming within its southern component.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Explore, and if feasible, coordinate a volunteer water quality monitoring program for Pellicer Creek linked to the GTM Research Reserve's SWMP activities.
2. Summarize information from GTM Research Reserve's southern component affiliated volunteer and SWMP monitoring projects for integration into its education and stewardship program.

Resource Management Strategies:

Core Strategies

1. Increase staff presence and stewardship activities in the GTM Research Reserve's southern component.

Education and Outreach Strategies:

Core Strategies

1. Increase efforts to interpret coastal habitats through displays, fact-sheets, posters, K-12 programming, and public outreach activities in the southern component of the GTM Research Reserve.
2. Plan workshops using facilities located in Marineland.
3. Increase Friends of the Reserve's presence and activities at the south office.

Secondary Strategies

1. Partner with Florida Audubon and Flagler County to increase opportunity for volunteer monitoring of bird populations and related educational opportunities within the conservation lands of the southern component.

Performance Measures:

1. The number of educational programs completed in the southern component of the GTM Research Reserve.
2. The number of workshops delivered at the Marineland facility and surrounding area.
3. The number of research projects initiated in the southern component of the GTM Research Reserve.
4. The number of stewardship activities accomplished in the southern component of the GTM Research Reserve.

6.5 / Cultural Resources

Goal: Enhance understanding, interpretation and preservation of the GTM Research Reserve's cultural resources.

Introduction: The lands and waters that make up the GTM Research Reserve have a rich history of human occupation. In order to adequately assess and interpret the full range of cultural resources the GTM Research Reserve will facilitate and conduct research to serve as a foundation for developing a comprehensive cultural resources management plan. All land management activities involving ground disturbing components will undergo a cultural resources assessment using best management practices as defined by the Florida Department of State Division of Historical Resources.



Local leaders and educators are a primary constituency for environmental workshops and field studies.

Issue Thirty: A cultural resources inventory for CAMA managed uplands at GTM Research Reserve has not been completed

Introduction: CAMA managed lands within the GTM Research Reserve have a rich history of human occupation dating back over 5000 years. In order to better protect these valuable culture resources the GTM Research Reserve needs a detailed assessment of the location and description of these resources.

Objective Thirty: Complete Phase I and Phase II archaeological surveys of CAMA managed lands on the Guana Peninsula.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Summarize research information regarding cultural resources for integration into the GTM Research Reserve's education and stewardship programs.
2. Working with partners, pursue grant funding to refine information on known archaeological sites and identify prehistoric settlement patterns.

Resource Management Strategies:

Core Strategies

1. Complete Florida Master Site File forms for all known but unrecorded sites.
2. Plan and initiate a program of professionally conducted cultural landscape studies throughout CAMA managed uplands incorporating Phase I and if feasible, Phase II archeological surveys.
3. Provide GIS support for archeological surveys.

Education and Outreach Strategies:

Core Strategies

1. Interpret the results of archeological surveys through displays, fact-sheets, posters, K-12 programming, and public outreach activities.

Performance Measures:

1. Number of cultural sites surveyed using Phase I criteria.
2. Number of cultural sites surveyed using Phase II criteria.
3. Initiation of a Cultural Landscape Study for CAMA managed lands on the Guana Peninsula.
4. Number of new sites recorded.
5. Percent of the Guana Peninsula surveyed using Phase I Criteria.

Issue Thirty-One: There is a need for a consolidated list of archeological artifacts collected from CAMA managed lands of the GTM Research Reserve

Introduction: Archaeological artifacts have been collected from the GTM Research Reserve since the late 1800's. Fortunately these collections have been documented and preserved at reputable institutions. Nevertheless a comprehensive description of the entire collection needs to be compiled and made accessible to educators and researchers to interpret and study.

Objective Thirty-One: Develop the first complete scope of collections for all artifacts collected from CAMA managed lands.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Identify the location, condition and obtain a digital photo and description of all artifacts previously collected by archaeologists.

Resource Management Strategies:

Core Strategies

1. Assemble a "scope of collections" statement, including a catalog and inventory of all permanent collections held at the GTM Research Reserve or elsewhere.
2. Provide GIS support for these archaeological inventories.

Education and Outreach Strategies:

Core Strategies

1. Interpret information, photos and collected artifacts through displays, fact-sheets, posters, K-12 programming, and public outreach activities.

Performance Measures:

1. Completion of the “scope of collections”.
2. The number of artifacts cataloged.

Issue Thirty-Two: Lack of public awareness relating to the significance of the cultural resources within CAMA managed lands and waters of the GTM Research Reserve

Introduction: As the GTM Research Reserve’s archaeological surveys and artifact collection inventory are progressing this information will need to be incorporated into its education and outreach programs.

Objective Thirty-Two: Enhance opportunities for the public to experience the significance of the cultural resources on CAMA managed lands within the GTM Research Reserve.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Summarize information regarding cultural resources for integration into the GTM Research Reserve’s education and stewardship programs.

Resource Management Strategies:

Core Strategies

1. Install adaptable-interpretive kiosks and displays to provide up-to-date information on cultural resources for visitors to the GTM Research Reserve.
2. Work cooperatively with the Lighthouse Archaeological Maritime Program (LAMP) and other partners to explore and, if feasible, establish a Florida National Maritime Heritage Designation for the GTM Research Reserve and surrounding area.

Education and Outreach Strategies:

Core Strategies

1. Seek training for staff and volunteers in cultural resource interpretation.
2. Host Archaeology Symposia at the GTM Research Reserve.
3. Develop a program involving docents to provide cultural resource information to trail users and EEC visitors
4. Develop kiosks, displays, fact sheets and brochures to interpret specific cultural artifacts and resource sites such as Shell Bluff, Wright’s Landing, Sanchez Mound and other significant sites or artifacts.
5. Include information on cultural resources and history in the GTM Research Reserve K-12 and adult education programming.

Performance Measures:

1. Trends in user satisfaction survey responses regarding cultural resource interpretation on visitor use surveys.
2. Increased partnerships with cultural resource based organizations, educators and scientists.
3. Trends in educational opportunities involving the GTM Research Reserve’s archaeological resources including media coverage and the number of new kiosks, fact sheets, displays and brochures.

Issue Thirty-Three: Degradation of known cultural sites on the Guana Peninsula

Introduction: Coastal erosion, and to a lesser extent vandalism, threatens the integrity of the GTM Research Reserve’s cultural resources. This issue is principally associated with coastal erosion of Shell Bluff and Wright’s Landing sites along the Tolomato River and vandalism or hog damage occurring at cultural resource sites on the Guana Peninsula. Research indicates that the erosion of the Tolomato

shoreline is a combination of wave and current energy associated with boat wakes, tides, storms, and wind. Sea level rise may also be adversely influencing coastal erosion. The GTM Research Reserve will partner with other governmental agencies, universities, private groups and citizens to seek solutions to preserving the cultural heritage of the Guana Peninsula.

Objective Thirty-Three: Develop an effective approach to maintain and conserve known archaeological sites and their associated artifact assemblage from vandalism, erosion and other forms of degradation.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Monitor the condition of sites through the use of photo points.
2. Summarize information from surveys and photo points for integration into the GTM Research Reserve's education and stewardship programs.

Resource Management Strategies:

Core Strategies

1. Regularly assess the condition of recorded and unrecorded cultural resources.
2. Document vandalism and hog disturbance.
3. Discourage vandalism and hog disturbance through fencing and other means as deemed necessary.
4. Seek professional archaeological assessments to document and determine feasibility of relocation, re-creation and repair of historic structures.
5. Work cooperatively with the FIND and other partners to explore, and if feasible, preserve and interpret historical maritime settlements threatened by coastal erosion.

Education and Outreach Strategies:

Core Strategies

1. Develop kiosks, fact sheets and brochures to interpret repair, relocation, re-creation and rehabilitation of historic structures of cultural sites threatened by coastal erosion.

Performance Measures:

1. Trends in visible damage through time as documented by photo points.
2. Historic structures and artifacts are preserved, relocated, re-created or repaired.

6.6 / Global Processes

Goal: Serve as a clearinghouse of information concerning global and meteorological processes and a demonstration site for green building technologies and practices.

Issue Thirty-Four: The GTM Research Reserve's EEC should serve as a model for the green building technologies for the community

Introduction: On July 13, 2007, Florida Governor Crist signed three climate change related executive orders. These orders set greenhouse gas (GHG) emission reduction targets for state agencies and departments of 10 percent below current levels by 2012, 25 percent below by 2017, and 40 percent below by 2025. The order also adopts the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) standards for all new state government facilities and all existing buildings owned by the Department of Management Services. Furthermore they require state-owned vehicles to be more fuel efficient and to use ethanol and biodiesel fuels when available. In addition, these orders set statewide GHG emission reduction targets to the year 2000 level by 2017, the level during 1990 by 2025, and 80% below 1990 levels by 2050. The order directs the Florida Secretary of Environmental Protection to immediately develop rules to adopt the California motor vehicle GHG emission standards. The Florida Energy Code for Building Construction will also be revised to increase the energy performance of new construction by at least 15% from the 2007 Building Energy Code Standards. The Florida Public

Service Commission has been requested to initiate rulemaking to require that utilities produce at least 20% of their electricity from renewable sources. The Governor also created an Action Team on Energy and Climate Change to develop an Energy and Climate Change Action Plan to recommend ways to meet the new GHG reduction targets. The GTM Research Reserve's EEC is uniquely suited to serve as a meeting place and a clearinghouse for information as well as a demonstration site for green building technologies.

Objective Thirty-Four: Retrofit the GTM Research Reserve's EEC to serve as a demonstration site for green technologies and to reduce its reliance on nonrenewable energy.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Collect and summarize data regarding energy and cost savings associated with various retrofits and integrate this information into the education and stewardship program.

Resource Management Strategies:

Core Strategies

1. Develop an Environmental Systems Management Plan for the GTM Research Reserve's facilities and vehicles.
2. Maintain on-site demonstration displays for FYN landscapes and renewable energy technologies, such as reducing the use of maintenance intensive sod for landscaping and replacing the areas of sod with native ground cover.

Education and Outreach Strategies:

Core Strategies

1. Develop fact sheets and brochures to interpret EEC improvements (water conservation, energy demand and recycling).
2. Conduct a workshop addressing green building retrofitting technologies.
3. Develop on-site demonstration displays for FYN landscapes, green technologies, sustainable living, and best management practices (BMP's).
4. Develop a volunteer based committee to take ownership of landscaping and building technologies to implement portions of the Environmental Management System plan for the EEC (i.e., reduce areas to be mowed, decrease impervious surfaces, better manage landscape vegetation, research and recommend alternative energy sources, reduce energy consumption, and increase recycling).

Secondary Strategies

1. Coordinate with DEP's Energy Office to provide information regarding grants and opportunities to the communities surrounding the GTM Research Reserve.

Performance Measures:

1. Trends in the GTM Research Reserve's water and fuel consumption, electricity used, and recycling program.
2. Trends in public requests for green building and renewable energy information.

Issue Thirty-Five: The need to disseminate the latest information on global climate change and sea level rise

Introduction: Sea level rise and global warming will eventually influence all coastal communities and habitats throughout the world. NOAA and DEP are the federal and state agencies charged with taking the lead on global climate issues. Due to its affiliation with these agencies, the GTM Research Reserve is uniquely positioned to be a source of information regarding this important topic and to serve as a clearinghouse for the latest scientific information.

Objective Thirty-Five: Disseminate up-to-date scientific information regarding climate change and sea level rise.

Integrated Strategies

Ecosystem Science Strategies:

Core Strategies

1. Partner with United States Geological Survey researchers to establish Sediment Elevation Table monitoring within the GTM Research Reserve.
2. Facilitate or conduct species range expansion monitoring including invasive species.
3. Partner with NOAA on sea level rise projects for access to the most current data sets and projections.
4. Summarize information from the GTM Research Reserve's workshops and monitoring programs for integration into its education and stewardship programs.
5. Facilitate or conduct monitoring of long-term sentinel emergent marsh habitats associated with the GTM Research Reserve's SWMP activities.

Resource Management Strategies:

Core Strategies

1. Based on the current state of knowledge of sea level rise, assess potential natural and cultural resource losses and begin a long-term planning process.
2. Provide GIS support to educational and research climate change and sea level rise initiatives.
3. Work cooperatively with local and regional partners to develop and implement restoration or acquisition plans to respond to marsh habitat migration scenarios associated with predicted sea level rise.

Education and Outreach Strategies:

Core Strategies

1. Develop fact sheets and brochures to interpret the fate of specific cultural and natural resources based on the best available information on global climate change and sea level rise.
2. Include research results for the GTM Research Reserve's sediment elevation tables into its educational programming.
3. Conduct workshops addressing climate change and sea level rise for the local community and northeast Florida region.

Performance Measures:

1. Trends in requests for the GTM Research Reserve to provide information regarding sea level rise and climate change.
2. Trends in sea level rise and climate change research projects initiated.
3. Trends in long-term planning for habitat migration and cultural resources preservation.



Public access must be accompanied by assessments of habitat condition to ensure sustainable high quality user experiences.

Part Three

Additional Plans

Chapter Seven

Administrative Plan

Background

Administration of a National Estuarine Research Reserve (NERR) is accomplished through federal, state and local partnerships. At the national level, the National Oceanic and Atmospheric Administration (NOAA) is responsible for the administration of the NERR System. NOAA's Estuarine Reserves Division (ERD) works with state agencies in developing a national network of estuarine research reserves. NOAA provides funding to eligible state agencies for the establishment and continued operation of reserves, as well as funding for construction and land acquisition activities; provides program guidance and oversight including review and approval of management plans; and conducts periodic evaluations to validate that operations are consistent with NERR goals and objectives.

The DEP is responsible for local administration and management of Florida's research reserves. CAMA, within DEP's Division of Land and Recreation, administers on-site operations, hires GTM Research Reserve staff and reviews program content for each NERR in the state. CAMA also manages the state's 41 aquatic preserves and partners with NOAA in the management of the Florida Keys National Marine Sanctuary. It uses information developed within the NERR program to improve management in its other marine and estuarine program areas of responsibility.

Current Staff

The GTM Research Reserve staff assignments are organized to facilitate the implementation of this management plan and to accommodate the transition of the program's roles and responsibilities in response to increased workloads associated with new facilities, public use, and performance based management since NERR designation in 1999.

GTM Research Reserve has established on-site management staff since designation to reach the current point of staffing. Current staff consists of an on-site manager; program coordinators for ecosystem science, education and outreach, the coastal training program, administrative services and resource management (public use, stewardship and facilities) and support staff. DEP will seek additional program development and staffing as appropriate for implementing the GTM Research Reserve management plan.

As of September 30, 2008, the GTM Research reserve had fourteen State of Florida Career Service positions, one contracted employee, and seventeen non-career service positions for a total of thirty-two on-site staff. The following describes the GTM Research Reserve's organization chart, and each program team's staffing and primary responsibilities:

Reserve Manager /Florida East Coast Aquatic Preserve Regional Administrator

Primary Responsibilities: Directs and supervises education, coastal training, research, resource management, administration and facilities staff of the GTM Research Reserve in the implementation of policies and programs; acts as liaison for state, federal and local agencies in cooperative resource protection/management and overall operation of the GTM Research Reserve. As the CAMA East Coast Regional Administrator, this position also has oversight responsibilities for eleven aquatic preserves encompassing 261,500 acres of coastal resources with substantial influence on the coastal zone management policies within the region and the state. The CAMA East Coast region of Florida includes the Northeast Florida Aquatic Preserve, Wekiva River Aquatic Preserve, East Central Florida Aquatic Preserve and Southeast Florida Aquatic Preserve field offices. The Regional Administrator directly supervises a total of seven GTM Research Reserve Program Coordinators and four Aquatic Preserve Managers. Fifty-two employees are presently assigned to the CAMA east coast region.

Ecosystem Science Team - Two Coordinators, Four Support Staff

Primary Responsibilities: This team is responsible for overseeing the GTM Research Reserve's research and monitoring, and database management program as required to implement the



Science-based teacher training is a primary function of the GTM Research Reserve's education program.

management plan. In addition this team provides logistic support for visiting investigators and ensures that NOAA SWMP protocols and research performance measures are maintained. This team also takes a lead role in maintaining and improving the GTM Research Reserve's Geographic Information Systems (GIS) program.

Resource Management Team (Stewardship, Public Use and Facilities) - Two Coordinators, Ten Support Staff
Stewardship

Primary Responsibilities: This team serves as the GTM Research Reserves primary habitat restoration, exotic and invasive species control, and watershed-scale land acquisition and conservation planning branch. It also is responsible for law enforcement coordination and implementing the GTM Research Reserve's prescribed fire management objectives.

Public Use and Facilities

Primary Responsibilities: This team is responsible for public use and facilities management need of the GTM Research Reserve. The team ensures that the GTM Research Reserve lands are safe and available to the public through trails and signage. They also oversee contracted services for maintenance and operation of all facility needs for the GTM Research Reserve. This includes the 21,282 square foot Environmental Education Center at Guana River and the 2,500 square foot GTM Research Reserve office at Marineland. Services include: aquariums, salt-water supply and filtration systems, auditorium, audio-visual theater, exhibit area, gift-shop, dock, vehicles, boats and all air-conditioning, plumbing, security system, janitorial/cleaning services, waste management, pest control, landscaping, or other infrastructure related needs. In addition, this team is responsible assisting the CAMA central office staff to ensure all GTM Research Reserve construction projects are completed to the best possible specifications and within a reasonable timeframe.

Administration/Operations Team - One Coordinator, Four Support Staff

Primary Responsibilities: This team performs duties to include accounts payable/receivable, monitoring all expenditures, reconciles expenditures and receipts with Florida Accounting Information Resource (FLAIR) reports. Identifies errors in FLAIR report expenditures and prepares correction memo if necessary. The team is also responsible for guiding other staff in basic purchasing and contract processes and serves as the primary phone and front desk support staff. GTM Research Reserve revenue, grant and State funds are tracked and projected by this team to ensure proficiency in all fiscal matters. Another important role provided by this team is to serve as the Secretary for the GTM Research Reserve's Management Advisory Group (MAG) and to function as the executive secretary to CAMA's regional administrator and Reserve Manager.

Education & Outreach Team - One Coordinator, Five Support Staff

Primary Responsibilities: This team is responsible for the development and implementation of GTM Research Reserve's public education and outreach programs. They recruit voluntary participation in GTM Research Reserve teaching and outreach programs, organize K-12 teacher, intern and volunteer training curricula, oversee the GTM Research Reserve Living in Florida's Environment (LIFE) Program and develop community based outreach materials and programming to expand the GTM Research Reserve's ability to implement its management plan. This program team serves as the GTM Research Reserve's primary liaison with volunteers and its Citizens Support Group (Friends of the GTM Reserve). This team also tracks and reports NOAA education activity related performance criteria as required.

Coastal Training Program Team - One Coordinator, One Support Staff

Primary Responsibilities: This team is focused on the needs of government, academic, non-profit organizations, agriculture, developers, real estate, marine trades, homeowners associations, landscapers and other coastal decision makers for up-to-date information. This program team addresses these educational needs by cooperating with regional partners to deliver professional training programs and workshops based upon the best available scientific knowledge and expertise. This team also tracks and reports NOAA CTP-related performance criteria as required.

Anticipated Staffing Needs

Change in Funding Source:

To successfully achieve the GTM Research Reserve's long-term management goals and objectives, and to comply with NOAA expectations for Research Reserve core positions (Manager, Education Coordinator and Research Coordinator) to be supported by partnering agencies two federally funded positions must be moved to State funding (**GTM Research Reserve Manager and Research Coordinator**).

Position Conversions (Other Personnel Service to Career Service)

In order to reduce staff turnover and improve long-term job satisfaction it is the goal of the GTM Research Reserve to seek opportunities to provide health and retirement benefits for all full-time employees. Positions described below do not represent an all inclusive list but merely an attempt to prioritize realistic staffing objectives for OPS to Career Service conversions over the next five years. When feasible, the GTM Research Reserve Administrative Team will also seek opportunities to contract with partnering agencies and organizations to provide benefits for these and other employees.

Administration

Administrative Assistant I/Executive Secretary (Additional Recurring Cost: \$5,185)

This position serves an essential role as the Environmental Administrator's assistant, including scheduling meetings, travel and other organizational duties as assigned. This position also serves as the GTM Research Reserve's Management Advisory Group's Secretary. The stability provided by converting this position will directly benefit the GTM Research Reserve through continuity of administrative functions.

Research

Water Quality Monitoring Program Coordinator/Environmental Specialist II (Additional Recurring Cost: \$7,421)

The Research Assistant assists the Research Coordinator is an essential position of the GTM Research Reserve research program implementing all its research initiatives. This position serves as the GTM Research Reserve's Water Quality Program Coordinator and is responsible for deployment, maintenance and data management of the meteorological and water quality monitoring instrumentation, providing logistical support to research project leaders in developing and implementing laboratory and field research studies; assisting in research data management/analysis and the preparation of reports; providing general care and maintenance for the GTM Research Reserve laboratory and field equipment.

Biological Scientist II (Additional Recurring Cost: \$6,306)

This position is the GTM Research Reserve's primary field biologist. Duties include addressing the biological science needs of the GTM Research Reserve. Areas covered include marine biology, wildlife biology, botany, taxonomy, coastal ecology, ecosystem management and habitat restoration science. Tasks involve issues of natural resource inventory and assessment; endangered species monitoring and protection; Planning, permitting and conducting of: prescribed fire management; restoration (habitat and hydrologic); and exotic-invasive plant and animal control.

Education

Volunteer Coordinator (Environmental Specialist II) (Additional Recurring Cost: \$7,421)

This position assists the Education Coordinator in the development and implementation of the GTM Research Reserve volunteer programs. Duties include recruiting and organizing the GTM Research Reserve volunteer workforce. These volunteers assist with all aspects of the GTM Research Reserve program including resource management, ecosystem science, education and outreach, and administrative activities.

Events Planner/Public Information Specialist (Environmental Specialist II) (Additional Recurring Cost: \$7,421)

Duties include scheduling all GTM Research Reserve programs such as K-12 school programs, Brown bag lunch series, adult evening lecture series, nature walks, partner agency meetings, agency



Education strategies include the development and implementation of teacher training modules aligned to Florida standards.

conferences, educational festivals such as Earth Day, etc. Manages events and serves as primary staff person on site to supervise all aspects of particular meetings or events. This position coordinates with staff/volunteers with regard to GTM Research Reserve events. This position also assists with various public relation operations to include the writing of monthly newsletter, calendar of events, and articles for newspapers or magazines.

Resource Management

Park Service Specialist (Additional Recurring Cost: \$5,683)

Duties include insuring GTM Research Reserve rules are enforced pertaining to all natural, historical and archeological resources and associated public use facilities. This position assists with visitor education at GTM Research Reserve recreational areas regarding rules and regulations governing recreational fishing, boating, biking, hiking, kayaking, horseback riding and other activities. This position also assists with land management/stewardship programs as needed including prescribed fire and exotic species control. In addition, this position assists with protection of natural communities and maintains optimum species control via mechanical, natural and chemical means. The incumbent aids in training and oversight of volunteers involved with various GTM Research Reserve programs. The position is also responsible for opening up all GTM Research Reserve's Guana River facilities, gates, doors, etc. on assigned days and maintaining the cleanliness of public use areas.

New Positions

Administration

Assistant Manager (Additional Recurring Cost: \$59,368)

The current management organization structure of the GTM Research Reserve provides a supervisor to employee ratio of 1:11 for the Regional Administrator. Although this ratio might be considered optimum

for a single site, the range of duties and responsibilities currently assigned to the Environmental Administrator along with oversight responsibilities for five satellite offices (Marineland Office and four Aquatic Preserve Offices) requires an assistant manager position to improve regional communications and to delegate GTM Research Reserve responsibilities in a more efficient and effective manner.

Operations and Management Consultant II (Additional Recurring Cost: \$49,485)

Growth of the GTM Research Reserve Staff, increasing requirements to administer multiple grants and contracts, and regional duties have grown significantly since the original designation of the GTM Research Reserve. In order to reduce turnover in the lead grants and contracts administration position a competitive salary must be offered that matches job responsibilities.

Operations and Management Consultant II (Additional Recurring Cost: \$49,485)

The position is needed to oversee the operations and maintenance of existing GTM Research Reserve facilities and support staff. This position directly supervises six positions including park rangers, visitor service specialists and maintenance staff. The incumbent will also oversee implementation of the environmental systems plan and all improvements/maintenance of the GTM Research Reserve's facilities, vehicles and vessels.

Administrative Assistant II (Additional Recurring Cost: \$31,589)

This administrative Assistant II position would provide administrative support to the East Coast Regional Manager by specializing in support for grants and contractual services. The CAMA East Coast Region consists of four Aquatic Preserve field offices and two GTM Research Reserve offices. Duties of this proposed position would also include assisting with training, budget coordination, human resources, as well as follow-up on terminations per DEP and CAMA directives. This position would also provide back-up to regional administrative staff during vacancies to support continued purchasing, p-card review and reconciling and QuickBooks management and would serve as a regional trainer for all aspects of administrative tasks.

Research

Assistant SWMP Technician (Additional Recurring Cost: \$31,589)

Since the initiation of the NERR System-wide Monitoring Program additional components have been added that significantly increases the technical proficiency of the personnel responsible for this essential grant funded program. An assistant SWMP technician position is needed to ensure long-term quality and reduced down time in the GTM Research Reserve's contribution to the SWMP program in the event there is turnover in the primary coordinator position.

Research Assistants (Additional Recurring Cost: \$31,589)

These part-time or temporary positions would be filled as needed to respond to changes in needs associated with research and monitoring activities such as sea turtle season, to assist visiting investigators, initiate pilot projects and other temporary needs. The ability to provide these positions to assist partner agencies and organizations will greatly enhance the GTM Research Reserve's ability to leverage grant funds and forge new partnerships.

Education

Teaching Assistants (Additional Recurring Cost: \$31,589)

These positions would be filled as needed to respond to changes in needs associated with education and outreach activities such as school programs, teacher training, events, and summer camps. Given the GTM Research Reserve's proximity to several quality educational institutions and active participation in the Florida Marine Science Educators Association these positions may be filled by off duty teachers or interns.

Resource Management

Watershed Coordinator (Additional Recurring Cost: \$39,257)

This position is needed to coordinate and implement the GTM Reserve's Resource Management strategies associated with "Watershed Landuse" in coordination with the GTM research Reserve's Education and Outreach, Resource and Ecosystem Science Program Team. Duties will include review and comments to County and City Comprehensive Plan Process, coordinate with major private and public landowners to encourage best management practices that emphasize and promote sustainable community concepts and long-term coastal water quality protection.

Seasonal Rangers (Additional Recurring Cost: \$25,279)

In response to seasonal shifts in workload it would be beneficial for the GTM Research Reserve to hire temporary ranger positions to augment core staff during hunting and peak tourist season. These seasonal positions would be filled to assist with public use and maintenance activities as needed. This is a similar to the process implemented at state and federal parks in response to temporary summer staffing needs.



Weekend and special event programming allow parents and children to learn about the GTM Research Reserve.

Chapter Eight

Facilities Plan

The Facilities Team at the GTM Research Reserve provides facilities and infrastructure for staff, visiting scientists and the public to effectively implement its Ecosystem Science, Resource Management, and Education and Outreach strategies. The GTM Research Reserve would like to be recognized as a regional center of excellence for innovative expertise in coastal natural resource management and conservation, research, monitoring and education and advocacy of coastal stewardship through ecologically sensitive planning and construction of new or remodeled facilities. GTM Research Reserve, with funding assistance from the National Oceanic and Atmospheric Administration (NOAA), completed a Master Facilities Plan in 1999. This plan is updated every 10 years.

Emergency Action Plan

An Emergency Action Plan including hazards communication protocols will be formulated and shall be updated as needed.

Environmental Management Systems Plan

At GTM Research Reserve, we are committed to providing a safe and healthy working environment for all staff; protecting the general public and the environment from unacceptable environmental, safety and health risks; and operating in a manner that protects and restores the environment. An integral part of the GTM Research Reserve's management plan will be the development of an Environmental Management System Plan for the facilities directly managed by its staff. This plan will include three sections: 1. Water Conservation, 2. Energy Efficiency and 3. Pollution Prevention, Lessons learned and, when practical, demonstration displays will be incorporated into its education programs.

National and regional energy and water treatment costs are rising significantly. GTM Research Reserve will make energy efficiency and water conservation key elements of its facility planning effort. As part of the Environmental Management System Plan, the GTM Research Reserve staff will identify potential

facility improvements to reduce the reliance on nonrenewable energy sources and promote energy and water conservation and ensure a safe and healthy work environment for employees.

GTM Research Reserve staff is dedicated to helping prevent or minimize all pollutants (non-hazardous, hazardous etc.) to all media (air emissions, liquid effluents and solid waste). The Environmental Systems Plan will include opportunities for pollution reduction, resource conservation, recycling, energy efficiency, water conservation and purchasing environmentally preferable products and services.

Existing Facilities

GTM Research Reserve Northern Component Facilities

The existing facilities include a 21,282 square foot Environmental Education Center (EEC) located off State Road A1A in South Ponte Vedra Beach (Figure 22). This structure is designed to facilitate the education, research and stewardship components of the GTM Research Reserve. Following an extensive site review

process involving the cooperation of federal, state, local and regulatory officials, the previously disturbed Guana Dam site was altered to provide facilities and access to the 2600 upland acres under the direct management of the GTM Research Reserve staff. This location affords balance of resource protection and public use. There are two buildings for storage and maintenance, two restrooms, a picnic pavilion, parking area and boat ramps. There are also three beach access parking lots to the north of the Guana Dam site providing recreational opportunities along the Northern Component's 4.7 miles of undeveloped Atlantic Ocean beachfront.

The EEC provides a one-of-a-kind opportunity to offer hands-on environmental education and natural resource interpretation for northeast Florida. Open to the public seven days a week, the EEC is a superb visitors' center and starting point for experiencing the natural wonders that the GTM Research Reserve has to offer. The EEC parking lot has seventy-one parking spaces, including four Americans with Disabilities Act (ADA) compliant spaces, interspersed among islands of rare coastal scrub habitat. Upon exiting their vehicles, guests are surrounded by the native flora and fauna found within the boundaries of the GTM Research Reserve and northeast Florida. Live fish aquariums, environmental sculptures and dioramas, displays and films are just a part of what will make any trip to the EEC an exciting and informative experience for visitors of all ages. There are multiple labs and classrooms for educational and research purposes. There are offices, meeting rooms, a reference library, a two hundred seat auditorium with full audio visual equipment, and an aquarium livestock room.

The EEC houses the administrative, education, stewardship and research offices. The Education and Outreach staff is able to accommodate people in the local area with outstanding labs and classrooms designed specifically for environmental education. The building also enables the full implementation of the Coastal Training Program (CTP) and other educational

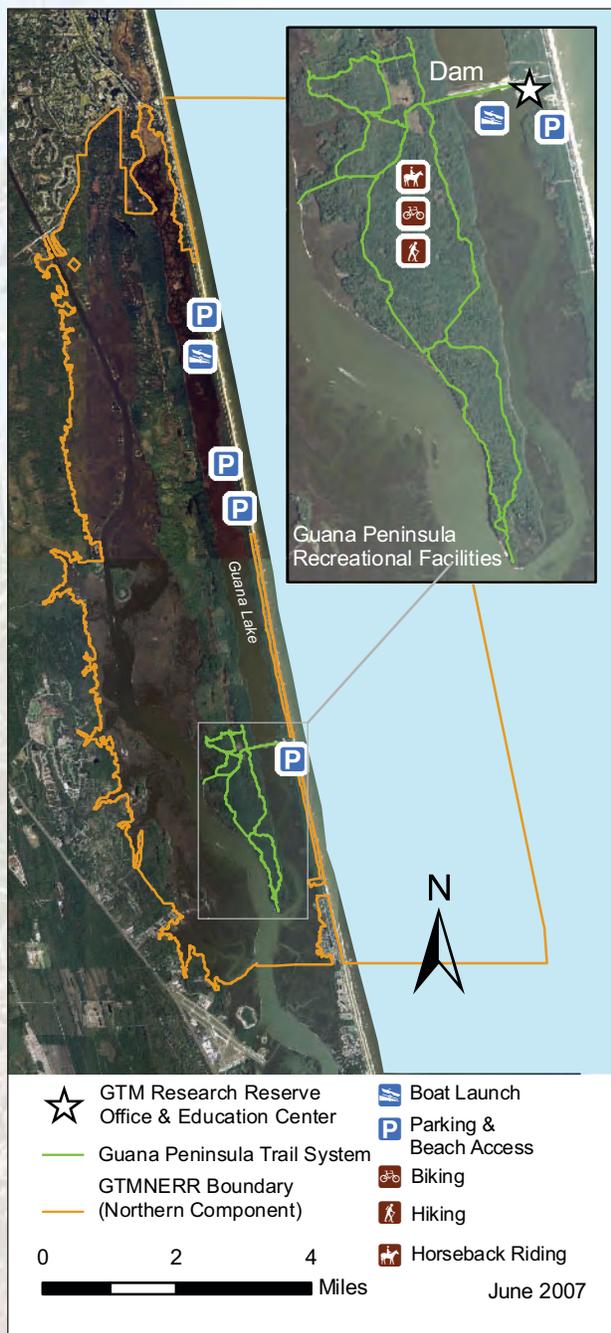


Figure 22 | Facilities and improvements within the CAMA managed area of the GTM Research Reserve.



The GTM Research Reserve in partnership with the town of Marineland encourages expansion of its role in local environmental research, education, and stewardship.

programs targeting public officials, school children, local citizens and visitors. The EEC facilitates research by providing facilities for staff, Graduate Research Fellows, partner organizations and guest scientists, to conduct research throughout the GTM Research Reserve. The EEC also provides for more collaborative efforts between the stewardship staff and the researchers. Volunteers are a large, powerful addition to the GTM Research Reserve Team that allows us to achieve much more than we would otherwise be able to. One such effort is the gift shop operated by volunteers and located in the EEC.

Adjoining the EEC property are the public recreation facilities at Guana Dam. These facilities include an automated entry pay station and guard house, paved road, paved boat ramps to both Ponte Vedra Lake and the Guana River, paved and marked trailer parking, paved parking for trail users, a trailhead picnic pavilion and restrooms and a restroom facility which includes a covered porch area adjacent to the fishing area. The guard house and pay station are linked to the EEC's network via an underground conduit, which continues on to the shop compound for future connection. The improved parking areas include eighty-seven automobile spaces (including five ADA compliant spaces) and ten designated trailer/boat spaces. All of these facilities have been added, or improved upon over the last five years in an effort to provide the needed amenities for visitors to ensure they do not adversely impact the environment. These improvements occurred at previously disturbed sites and were necessary to accommodate the increased public usage. Storm water runoff is captured and retained in swales for water quality improvement. The boat ramps were designed to arrest erosion, as were the new fences barring visitors from trampling previously damaged salt marsh areas. The sum of these many improvements is a more user-friendly recreational access area that strives by design to protect the GTM Research Reserve from ecological degradation.

The approximately seven thousand foot long feral hog fence between the CAMA managed lands and the Florida Fish and Wildlife Conservation Commission's (FWC) Guana River Wildlife Management Area to the immediate north has recently been replaced. An archaeological monitor was present during all digging phases in order to sift disturbed soils for archeological artifacts per the requirements of the Division of Historical Resources Compliance Review Matrix. The new fence was installed in an effort to keep destructive, non-native animals like wild hogs and armadillos in the Guana River Wildlife

Management Area away from GTM Research Reserve's significant archaeological and ecological resources. With annual inspections and repairs made to any damaged areas due to storms, these improvements should last for twenty-five years or more.

Three beach access parking lots are currently managed by GTM Research Reserve. The north lot provides sixty-five total parking spaces, three of which are ADA compliant. The middle lot provides eighty parking spaces, five of which are ADA compliant. The south lot has one-hundred parking spaces, six of which are ADA compliant. All three lots combined provide 240 total spaces, fourteen which are ADA compliant.

GTM Research Reserve Southern Component Facilities

The original GTM Research Reserve administrative building is located in the Town of Marineland in Flagler County. The proximity to the Marineland Oceanarium, River to Sea Preserve and the University of Florida's (UF) Whitney Laboratory for Marine Bioscience make this location ideal for continued use with a new emphasis on ecosystem science in Flagler County. The Southern Component also boasts several miles of Atlantic Ocean beachfront providing numerous recreational opportunities for a wide range of activities.

The Marineland facility will continue to serve the dual purposes of environmental education and public outreach for Flagler County while enabling a greater capacity for research in the GTM Research Reserve Southern Component.

Identified Future Facility Needs

Aquarium Support System (Estimated Cost: \$250,000)

The GTM Research Reserve is planning to design and build an aquarium support system. The aquarium support system is needed to properly care for and to showcase live specimens of northeast Florida native organisms and enhance the educational experience of all visitors. Appropriate choices in the completion of the aquaria system will minimize operation and maintenance time and costs, while maximizing visitors' educational experience and enjoyment along with the resident organisms' health.



The GTM Research Reserve Environmental Education Center provides quality educational experiences that provide science-based information fostering informed decisions by coastal communities.



Public access boardwalks and associated parking lots provide opportunities to inform visitors about coastal issues.

Equipment Storage Compound (Northern Component Facility) (Estimated Cost: \$170,000)

The existing shop immediately north of the EEC will be improved to provide vehicle, boat, and equipment storage. The current structure will have to be repaired and enhanced. An enlarged building or a new building will need to be added. The fleet to be stored in the shop area includes the off-road vehicles, tractors, trailers, trucks and boats to use as transportation and tools within the GTM Research Reserve. The storage areas will also house any other equipment necessary to achieve the goals and needs of the GTM Research Reserve.

Vehicle and Boat Storage (Southern Component Facility) (Estimated Cost: \$100,000)

There is a need to build a structure that can serve to both provide for a convenient way to rinse vehicles and equipment with freshwater and store them out of the elements. This will significantly reduce the need for maintenance and increase the useful years of service of these vehicles.

Interpretive Kiosks (Estimated Cost: \$40,000)

In the uplands habitat accessible from the Guana Dam and the beach access parking lots new interpretive kiosks need to be erected. These efforts will provide for both resource protection and recreational use of the uplands and beaches contained within the borders of the GTM Research Reserve's Northern Component.

Shell Bluff Erosion (Estimated Cost: \$100,000-1,400,000)

Shoreline change threatens to erode a Minorcan Well and other archaeological resources into the Tolomato River. The situation is critical as there is currently only approximately five feet of uplands between the Minorcan Well and the river at the top of an existing revetment. The Shell Bluff site is on the National Register of Historic Places. Options under consideration include, repair or replacement of an existing revetment or the relocation and interpretation of significant artifacts to a safer more sustainable location. In either case, signs, fencing and a kiosk will be built for cultural site protection and interpretation.



Access points, such as the Six-mile Landing boat launch provide for unique recreational opportunities.

Wright's Landing Erosion (Estimated Cost: \$200,000)

Wright's Landing, another historical landmark, is also experiencing severe erosion. The gradual sloping topography of this site is more amenable to shoreline stabilization through marsh habitat restoration than the Shell Bluff site.

Beach Access Parking Improvements (Estimated Cost: \$100,000)

These improvements are necessary for the safety and security of public users and staff alike. Options include, but are not limited to, more signage, lights, security personnel, automatic pay stations, and a dedicated and secure wireless network providing real time monitoring via webcam and emergency telephone. All existing boardwalks will be maintained and improved as needed while always balancing the need for such improvements against any potential environmental impacts.

Sand Fences within Dune Fields (Estimated Cost: \$5,000)

Sand fences may be necessary within GTM Research Reserve's beach dune habitat to prevent illegal access and to repair damage. The sand fences will be utilized at existing illegal access points caused by human foot traffic to prevent further degradation of the environment and rebuild the sand dunes.

Dormitories and Laboratory Facilities (Southern Component Facilities) (Estimated Cost: \$500,000)

Improvements to the Marineland laboratory will be implemented as funding allows. Coordination will continue with the UF Whitney Laboratory and the Dolphin Conservation Center in Marineland for dormitory and research facilities (e.g., mesocosms) as needed to accommodate increasing needs for researcher and educator dormitory and support facilities.



Guided by public recommendations the GTM Research Reserve's recreational experiences emphasize quality over quantity.

Chapter Nine

GTM Research Reserve Boundary Expansion and Land Acquisition Plan

9.1 / Scope and Purpose

“Core” and “Buffer” Areas: NERRS Regulations

NERRS Regulations, 15 C.F.R. Sec. 921.13, outlines requirements for “identifying the ecologically key land and water areas of the Reserve, ranking those areas according to their relative importance, and including a strategy for establishing adequate long-term state control over those areas sufficient to provide protection for Reserve resources to ensure a stable environment for research...”

The ecological characteristics of a Reserve, including its “biological productivity, diversity of flora and fauna, and capacity to attract a broad range of research and educational interests,” must necessarily be defined to establish requirements for managing in the most effective way possible the entire Reserve, but particularly its most sensitive, or “core” areas. Assurance that the boundaries of the GTM Research Reserve “encompass an adequate portion of the key land and water areas of the natural system [is defined] to ensure effective conservation...Reserve boundaries must encompass the area within which adequate control...will be established by the managing entity over human activities within the Reserve. Generally, Reserve boundaries will encompass two areas: Key land and water areas (or ‘core’ area) and a buffer zone. Key land and water areas will likely require significantly different levels of control...” (15 C.F.R. 921.11).

Key land and water areas are identified as that core area within the Reserve that is so vital to the proper functioning of the estuarine ecosystem that it must be under a level of control sufficient to ensure the long-term viability of the Reserve for research on natural processes. Key land and water areas are those ecological units that preserve for research a range of physical, chemical and biological factors

contributing to the diversity of natural processes occurring within the estuary. The establishment of which specific areas are to be identified as “core” within the Reserve is determined by scientific knowledge of that area and the degree of scientific research occurring within that area.

Buffer areas of the Reserve are identified as those areas that are adjacent to, or surround, the key land and water (core) areas and are essential to maintaining their integrity. Buffer zones protect the core area and provide additional protection for estuarine-dependent species.



GTM Research Reserve Core and Buffer Areas: Designation and Rationale

Core Area of the GTM Research Reserve

The core areas of the Reserve are the estuarine waters and associated marshes within the designated boundary for the Reserve associated with the Tolomato, Guana, and Matanzas Rivers and their tributaries (Figure 1). These core components ensure adequate, and direct, applications of state and federal control and management (Section 4.4), providing sufficient protection to ensure the integrity of a stable platform for the continuation of ongoing scientific investigation.

Buffer Area of the GTM Research Reserve

The immediate watershed of this core area defines the buffer area of the GTM Research Reserve. The marshes and uplands within the Northern Component of the Reserve along the Tolomato and Guana River include the CAMA Managed Lands of the former Guana River State Park, the Guana River Wildlife Management Area, Stokes Landing Conservation Area and Deep Creek State Forest (Figure 6). The southern component of the GTM Research Reserve’s core estuarine waters along the Matanzas River and Pellicer Creek are buffered by Favre-Dykes State Park, Washington Oaks Gardens State Park, Moses Creek Conservation Area, Pellicer Creek Conservation Area, Fort Matanzas National Monument, Princess Place Preserve and The River to Sea Preserve (Figure 7). These areas included within the GTM Research Reserve boundary contribute over 23,000 acres of buffer and provide outstanding protection to estuarine water quality.

Plan Lead(s): Mike Shirley, Environmental Administrator, GTM Research Reserve

Role of the Reserve: Stewardship, education, and research involving coastal ecosystems

Geographic Scope: The GTM Research Reserve boundary currently encompasses 64,487 acres of submerged lands and leased uplands in St. Johns and Flagler counties, Florida (Figure 1). After the proposed annexations (8,865.12 acres) and acquisitions (61.41 acres) the GTM Research Reserve will be approximately 73,413.53 acres.

Figure 23 / Proposed public lands identified for annexation into the GTM Research Reserve boundary.

Purpose: The proposed annexation of public lands will serve to streamline coordination of agencies within the GTM Research Reserve’s boundaries and strengthen partnerships. Direct management of these lands will remain with the existing designated entities.

Acquisition of Hat Island, the Rogers parcel (Figure 24) and the Marineland Hardwood Hammock and Coastal Trail System (Figure 25) will provide 61.41 acres of watershed protection to the submerged lands of the GTM Research Reserve and enhance protection of its upland natural and cultural resources.

9.2 / Key Plan Elements

9.2.1 / Annexation of existing public lands with no change in management designation (immediate boundary expansion, Figure 23)

Faver Dykes State Park (4,166.12 acres proposed to be included in the GTM Research reserve’s Boundary): On April 4, 2003, the State of Florida acquired 4,166.12-acre additional property to be managed as part of Faver-Dykes State Park. The GTM Research Reserve is requesting that the federally designated boundary be expanded to include that addition. This annexation is consistent with the Park’s management plan and the exiting Park-Reserve MOU. Direct management responsibilities will not be affected by this boundary expansion. The mutual benefits to the GTM Research Reserve and Faver-Dykes State Park are the extension of the existing partnership to include the new park lands and resources.

Matanzas State Forest (4,699 acres proposed to be included in the GTM Research reserve’s Boundary): Matanzas State Forest was established in 2003 with a 4,699 acres state acquisition. This property is immediately adjacent to the GTM Research Reserve’s southern component boundary. Matanzas State Forest was created from the Matanzas Marsh Northeast Florida Blueway Florida Forever Project. One of the primary reasons for this acquisition was to protect the last remaining undisturbed salt marsh within the GTM Research Reserve and is part of a 16,000 acre continuous conservation corridor beginning with Moses Creek managed by the St. John’s River Water Management District, and continuing south through the forest into Faver-Dykes State Park managed by the Florida Department of Environmental Protection, Pellicer Creek Conservation Area and Flagler County’s Princess Place Preserve.

Matanzas Marsh was deemed an important birding area by the Audubon Society. In addition to many song birds and wading marsh birds, bald eagles nest and hunt in the forest. Deer, otter, turkey, hogs, and gopher tortoises also inhabit the forest.

About 75% of the forest is upland and made up of pine plantations. The remaining 25% of the forest is wetlands including bay and cypress swamps. Slash and longleaf pines dominate the upland forest. The majority of the pine stands range in age from newly planted (2003) to thirty year old plantations.



Figure 24 | Proposed land acquisition parcels within the GTM Research Reserve’s northern component.

There is an archaeological record of possible Native American settlements in the area. Historic features include remains from turpentine camps. More recently, timber companies and hunt clubs shared the land that is now the forest.

This proposed annexation is compatible with existing MOU between the GTM Research Reserve and The Florida Division of Forestry and the management plan of the Matanzas State Forest. The mutual benefits to the GTM Research Reserve Matanzas State Forest are the extension of the existing partnership to include the new lands and resources. There will be no change in direct management responsibilities from this boundary expansion.

9.2.2 / Fee Simple Acquisitions

There are three parcels identified as high priority for acquisition with the Northeast Florida Blueways Program that remain to be acquired. The Northeast Florida Blueways (NEFB) program, a component of the Florida Forever Program, has served as the primary instrument for identifying potential parcels for

acquisition within the GTM Research Reserve watershed. The majority of the parcels that were originally identified through NEFB have been developed, removed from consideration by the landowner, or acquired by the State of Florida. Two of the highest priority parcels remaining within the NEFB program are described below. Beyond these 2 parcels, the reserve may now need to consider the encouragement of conservation easements within privately owned parcels as the best option for watershed protection.

With the acquisition of Hat Island, the Rogers Parcels and the Marineland Hardwood Hammock Habitat, the GTM Research Reserve would expand its existing cultural resource interpretation and protection, education and outreach programs, research program, prescribed fire, and exotic species control activities to include these management units. In addition, the waters of the Guana River Marsh Aquatic Preserve and estuaries nearby to Marineland (PCAP) are classified as Outstanding Florida Waters and are afforded the highest level of statutory protection. These proposed acquisitions will further enhance the protection of the region's rare and endangered species and habitats.

The Patricia A. Rogers Parcel (Figure 24): St. Johns County parcel # 142050 0000. This is an 18.63 acre in-parcel of uplands located on the Guana Peninsula that bisects the GTM Research Reserve's upland recreational trails. It consists primarily of maritime oak hammock with the Tolomato River on its western shore and the Guana River on the eastern shore and is ¼ mile north of the confluence of these 2 rivers. It contains a portion of Wright's Landing, an archaeological site designated by Site File 8SJ3. Wright's Landing contains artifacts dating to the First Spanish Period of colonization. It also contains an extensive shell midden with Pre-Columbian artifacts. Acquisition would protect natural and cultural resources within and adjacent to the site and insure that the reserve's recreation trails are not disrupted by activities related to private ownership or development.

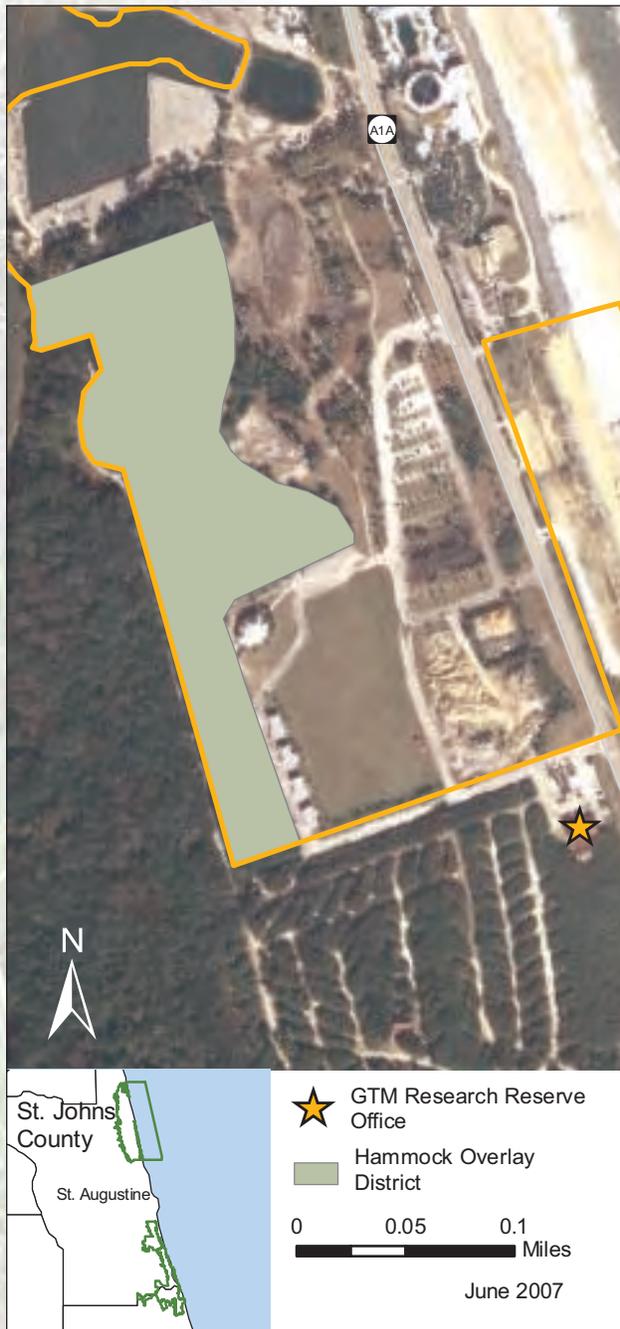
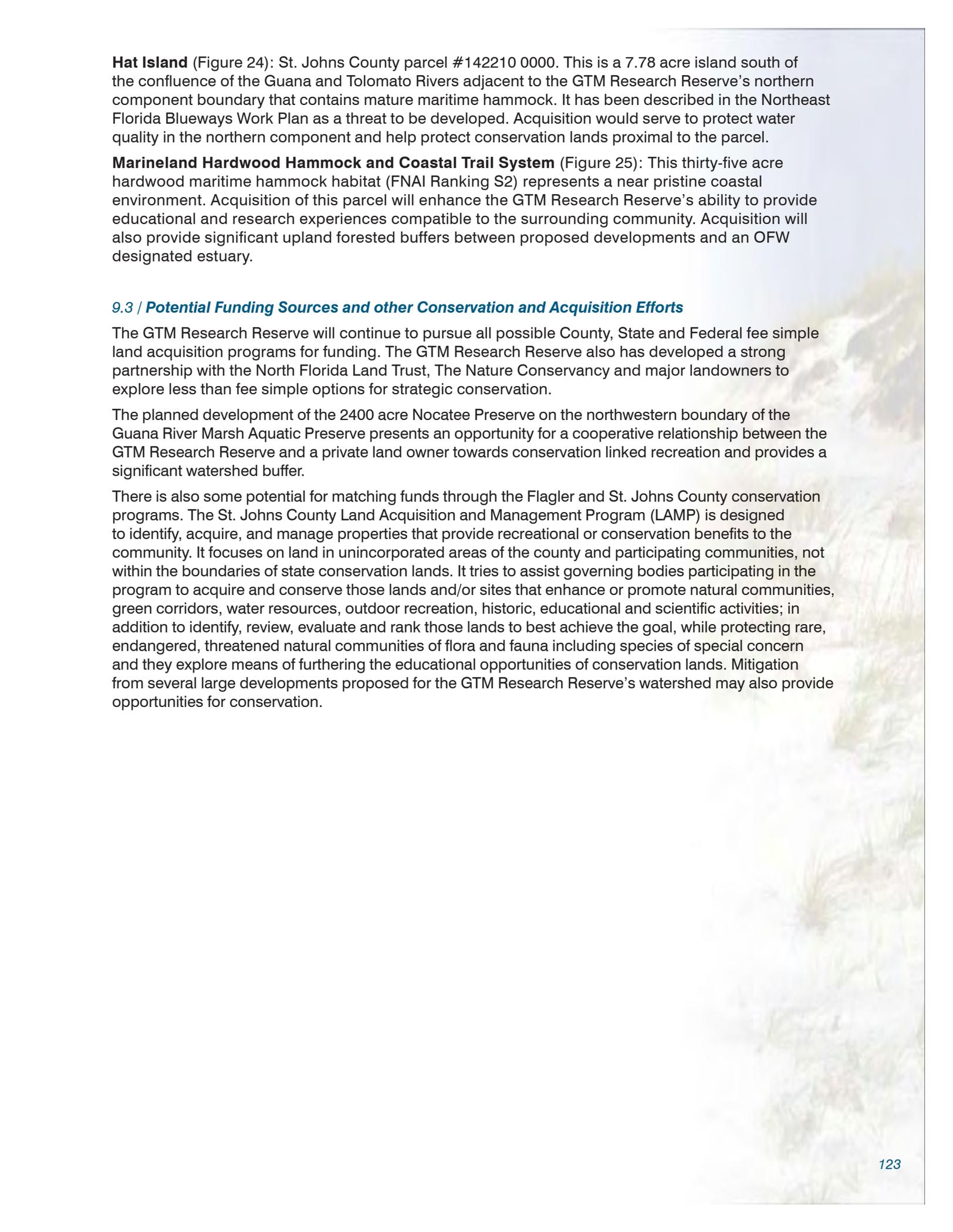


Figure 25 / Proposed land acquisition parcels in the GTM Research Reserve's southern component.



Hat Island (Figure 24): St. Johns County parcel #142210 0000. This is a 7.78 acre island south of the confluence of the Guana and Tolomato Rivers adjacent to the GTM Research Reserve's northern component boundary that contains mature maritime hammock. It has been described in the Northeast Florida Blueways Work Plan as a threat to be developed. Acquisition would serve to protect water quality in the northern component and help protect conservation lands proximal to the parcel.

Marineland Hardwood Hammock and Coastal Trail System (Figure 25): This thirty-five acre hardwood maritime hammock habitat (FNAI Ranking S2) represents a near pristine coastal environment. Acquisition of this parcel will enhance the GTM Research Reserve's ability to provide educational and research experiences compatible to the surrounding community. Acquisition will also provide significant upland forested buffers between proposed developments and an OFW designated estuary.

9.3 / Potential Funding Sources and other Conservation and Acquisition Efforts

The GTM Research Reserve will continue to pursue all possible County, State and Federal fee simple land acquisition programs for funding. The GTM Research Reserve also has developed a strong partnership with the North Florida Land Trust, The Nature Conservancy and major landowners to explore less than fee simple options for strategic conservation.

The planned development of the 2400 acre Nocatee Preserve on the northwestern boundary of the Guana River Marsh Aquatic Preserve presents an opportunity for a cooperative relationship between the GTM Research Reserve and a private land owner towards conservation linked recreation and provides a significant watershed buffer.

There is also some potential for matching funds through the Flagler and St. Johns County conservation programs. The St. Johns County Land Acquisition and Management Program (LAMP) is designed to identify, acquire, and manage properties that provide recreational or conservation benefits to the community. It focuses on land in unincorporated areas of the county and participating communities, not within the boundaries of state conservation lands. It tries to assist governing bodies participating in the program to acquire and conserve those lands and/or sites that enhance or promote natural communities, green corridors, water resources, outdoor recreation, historic, educational and scientific activities; in addition to identify, review, evaluate and rank those lands to best achieve the goal, while protecting rare, endangered, threatened natural communities of flora and fauna including species of special concern and they explore means of furthering the educational opportunities of conservation lands. Mitigation from several large developments proposed for the GTM Research Reserve's watershed may also provide opportunities for conservation.

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Additional Acquisition & Restoration Council Requirements

A.1 / Executive Summary (table format)

Guana Tolomato Matanzas National Estuarine Research Reserve Management Plan					
Lead Agency	Florida Department of Environmental Protection's Office of Coastal & Aquatic Managed Areas				
Common Name of Propert:	Guana Tolomato Matanzas National Estuarine Research Reserve				
Location:	St. Johns and Flagler counties, Florida				
Research Reserve Acreage Total	64,487				
Acreage Directly Managed	45,177				
Acreage Under BTIITF Lease	2489				
<i>FNAI Community Type</i>	<i>Total CAMA Managed Acres</i>	<i>% of Area</i>	<i>Acres Under BTIITF Lease</i>	<i>% of Area</i>	
Beach Dune	124	0.27	124	6	
Coastal Strand	483	1.07	483	22	
Mesic Flatwoods	17	0.04	17	1	
Scrub	15	0.03	15	1	
Shell Mound	76	0.17	76	3	
Xeric Hammock	668	1.47	668	31	
Depression Marsh	56	0.12	56	3	
Coastal Interdunal Swale	27	0.06	27	1	
Maritime Hammock	370	0.82	370	17	
Tidal Marsh	8053	17.83	307		
Tidal Swamp	346	0.77	346	16	
Unconsolidated Substrate	2496	5.52			
Ruderal	45	0.10			
Open Water	31692	70.15			
Not Mapped	709	1.57			
Total Acreage	45177		2489		
Lease/Management Agreement Numbers: #3462 between the Board of Trustees of the Internal Improvement Trust Fund and the Office of Coastal and Aquatic Managed Areas					
Designated Use	Single use for Conservation and Preservation				
Management Responsibilities	Agency - Florida Department of Environmental Protection's Office of Coastal and Aquatic Managed Areas lead manager				
Designation	National Estuarine Research Reserve				
Sublease(s)	Ponte Vedra Beach Civic Association				
Encumbrances	None				
Type Acquisition	Florida Forever, Conservation and Recreation Lands (CARL), Save Our Coast (SOC)				
Unique Features	Provides critical habitat for calving North Atlantic right whales; is a feeding and resting location for migrating shorebirds along the North American Atlantic Flyway; has 4.2 miles of pristine beach dune habitat; is located within a region with the oldest record of European occupation in North America; has an outstanding volunteer program donating over 10,000 hours per year; is supported by the community and has an active Management Advisory Group; contains extensive public use amenities including an extensive trail system, beaches with parking access and dune boardwalks, the Guana Lake Dam, and an Environmental Education Center that welcomes approximately 20,000 visitors per year including 2,500 students and teachers. Public use of the beaches and trail system is estimated to accommodate an additional 170,000 visitors per year.				
Archaeological/Historical	There are currently 61 recorded archaeological sites within the boundaries of the area directly managed by the Reserve. Known sites include a burial mound, numerous shell middens, a Spanish mission (probably La Natividad de Nuestra Senora de Tolomato), and homestead sites from the British, Second Spanish and Territorial Periods.				
Acquisition Needs/Acreage	61.41 Acres of Fee Simple Acquisition and 8,865.12 Acres of Annexation without re-designation of management authority.				
Surplus Lands/Acreage	None				
Public Involvement	Four Public Meetings and two Management Advisory Committee Meetings were conducted in preparing this management plan.				

Management Plan Compliance Checklist - Natural Resource Lands	
Requirements	Page
18-2.021 Acquisitions and Restoration Council.	
1. Executive Summary	Exec Sum & pg 126 (A.1)
2. The common name of the property.	Exec Sum & pg 126 (A.1)
3. A map showing the location and boundaries of the property plus any structures or improvements to the property.	Pgs 2 & 114 (Figs 1 & 22)
4. The legal description and acreage of the property.	Pgs 23 & 126 (Sec 4.2.3 & A.1)
5. The degree of title interest held by the Board, including reservations and encumbrances such as leases.	Pgs 21 & 126 (Sec 4.1 & A.1)
6. The land acquisition program, if any, under which the property was acquired.	Pgs 21 & 126 (Sec 4.1 & A.1)
7. The designated single use or multiple use management for the property, including other managing agencies.	Pg 126 (Sec A.1)
8. Proximity of property to other significant State/local/federal land or water resources.	Pgs 23, 24 & 49-54 (Fig 6 & 7 & Sec 4.4)
9. A statement as to whether the property is within an Aquatic Preserve or a designated Area of Critical State Concern or an area under study for such designation. If yes, make sure appropriate managing agencies are notified of the plan.	Pgs 1-3 (Sec 1.1)
10. The location and description of known and reasonably identifiable renewable and non-renewable resources of the property including, but not limited to, the following:	
A. Brief description of soil types, using U. S. D. A. maps when available;	Pgs 27-29 (Sec 4.2.7)
B. Archaeological and historical resources*;	Pgs 42-45 (Sec 4.2.15)
C. Water resources including the water quality classification for each water body and the identification of any such water body that is designated as an Outstanding Florida Waters;	Pgs 29-31 (Sec 4.2.8)
D. Fish and wildlife and their habitat;	Pgs 32-41 & 127-158 (Sec 4.2.10, 4.2.11, A.2-A.6)
E. State and federally listed endangered or threatened species and their habitat;	Pgs 41, 130-158 (Sec 4.2.11, A.5, A.6)
F. Beaches and dunes;	Pgs 32-41, 126 (Sec 4.2.10, Tbl 1, A.1)
G. Swamps, marshes and other wetlands;	Pgs 32-41 (Sec 4.2.10, Fig 15)
H. Mineral resources, such as oil, gas and phosphate;	Pgs 27-29 (Sec 4.2.7)
I. Unique natural features, such as coral reefs, natural springs, caverns, large sinkholes, virgin timber stands, scenic vistas, and natural rivers and streams; and	Exec Summary
J. Outstanding native landscapes containing relatively unaltered flora, fauna, and geological conditions.	Pgs 22-23 (Sec 4.2.2 & 4.2.3)
11. A description of actions the agency plans, to locate and identify unknown resources such as surveys of unknown archaeological and historical resources.	Pg 99 (Sec 6.5, Obj 30)
12. The identification of resources on the property that are listed in the Florida Natural Areas Inventory. <i>Include letter from FNAI or consultant, where appropriate.</i> [GTM NERR has staff qualified to identify resources on the property consistent with FNAI specifications therefore does not require a consultant for this purpose.]	Pgs 129-158 (Sec A.3, A.4, A.5, A.6)
13. A description of past uses, including any unauthorized uses of the property.	Pg 165 (Sec A.9 - GTM Site History)
14. A detailed description of existing and planned use(s) of the property.	Pgs 45-48 (Sec 4.3)
15. A description of alternative or multiple uses of the property considered by the managing agency and an explanation of why such uses were not adopted.	Pgs 45-48 (Sec 4.3)
16. A detailed assessment of the impact of planned uses on the renewable and non-renewable resources of the property and a detailed description of the specific actions that will be taken to protect, enhance and conserve these resources and to mitigate damage caused by such uses.	Pgs 69-104 (Ch 6)
17. A description of management needs and problems for the property.	Pgs 69-104 (Ch 6)
18. Identification of adjacent land uses that conflict with the planned use of the property, if any.	Pg 26 (Sec 4.2.5)
19. A description of legislative or executive directives that constrain the use of such property.	Pgs 16-19 (Sec 3.2, 3.3, 3.4)
20. A finding regarding whether each planned use complies with the State Lands Management Plan adopted by the Trustees on March 17, 1981, and incorporated herein by reference, particularly whether such uses represent "balanced public utilization", specific agency statutory authority, and other legislative or executive constraints.	Pgs 16, 18-19, 228, 257 (Sec 3.2, 3.4, B.2, B.8)

Management Plan Compliance Checklist - Natural Resource Lands

Requirements	Page
21. An assessment as to whether the property, or any portion, should be declared surplus.	Pg 172 (Sec A.10)
22. Identification of other parcels of land within or immediately adjacent to the property that should be purchased because they are essential to management of the property.	Pgs 119-123 (Ch 9)
23. A description of the management responsibilities of each agency and how such responsibilities will be coordinated, including a provision that requires that the managing agency consult with the Division of Archives, History and Records Management before taking actions that may adversely affect archaeological or historic resources.	Pgs 42, 99-102, 163-172, 230-253 (Sec 4.2.13, 6.5, A.9, B.6)
24. A statement concerning the extent of public involvement and local government participation in the development of the plan, if any, including a summary of comments and concerns expressed.	Pgs 263-303 (App D)
25. Letter of Compliance of the management plan with the Local Government Comprehensive Plan. Letter from local government saying that the plan is in compliance with local government's comprehensive plan.	Pg 257 (Sec B.8)
Additional Requirements - Per Trustees	
253.034 State-Owned Lands; Uses. - Each entity managing conservation lands shall submit to the Division of State Lands a land management plan at least every 10 years in a form and manner prescribed by rule by the Board.	
26. All management plans, whether for single-use or multiple-use properties, shall specifically describe how the managing entity plans to identify, locate, protect and preserve, or otherwise use fragile nonrenewable resources, such as archaeological and historic sites, as well as other fragile resources, including endangered plant and animal species.	Pgs 41, 99-102, 163-172, 168 (Sec 4.2.11, 6.5-obj. 30, A.9-beach mouse trapping)
27. The management plan shall provide for the conservation of soil and water resources and for the control and prevention of soil erosion.	Pgs 27-31 (Sec 4.2.7, 4.2.8)
28. Land management plans submitted by an entity shall include reference to appropriate statutory authority for such use or uses and shall conform to the appropriate polices and guidelines of the state land management plan.	Pgs 17-19 (Sec 3.3, 3.4)
29. All land management plans for parcels larger than 1,000 acres shall contain an analysis of the multiple-use potential of the parcel, which analysis shall include the potential of the parcel to generate revenues to enhance the management of the parcel.	Pgs 42, 45-48, 163 (Sec 4.2.14, 4.3, A.8)
30. Additionally, the land management plan shall contain an analysis of the potential use of private managers to facilitate the restoration or management of these lands.	Pg 194 (Sec A.12)
253.036 Forest Management.	
31. For all land management plans for parcels larger than 1,000 acres, the lead agency shall prepare the analysis, which shall contain a component or section prepared by a qualified professional forester which assesses the feasibility of managing timber resources on the parcel for resource conservation and revenue generation purposes through a stewardship ethic that embraces sustainable forest management practices if the lead management agency determines that the timber resource management is not in conflict with the primary management objectives of the parcel.	Pgs 42, 163 (Sec 4.2.14, A.8)
259.032 Conservation And Recreation Lands Trust Fund; Purpose.	
(10)(a) State, regional or local governmental agencies or private entities designated to manage lands under this section shall develop and adopt, with the approval of the Board of Trustees, an individual management plan for each project designed to conserve and protect such lands and their associated natural resources. Private sector involvement in management plan development may be used to expedite the planning process.	
32. Individual management plans required by s. 253.034(5), for parcels over 160 acres, shall be developed with input from an advisory group - Management plan should list advisory group members and affiliations.	Pgs 5, 263-267, 300-302 (Sec 1.3, D.2, D.3.1, D.3.3)
33. The advisory group shall conduct at least one public hearing within the county in which the parcel or project is located. Managing agency should provide DSL/OES with documentation showing date and location of public hearing.	Pgs 267-299 (Sec D.3.2)
34. Notice of such public hearing shall be posted on the parcel or project designated for management, advertised in a paper of general circulation, and announced at a scheduled meeting of the local governing body before the actual public hearing. Managing agency should provide DSL/OES with copy of notice.	Pg 5 (Sec 1.3)
35. The management prospectus required pursuant to 259.032 (9)(d) shall be available to the public for a period of 30 days prior to the public hearing. [Note: Property was purchased prior to mgmt prospectus requirement.]	[See note to the left.]
36. Summary of Advisory Group Meeting should be provided to DSL/OES.	Pgs 263-303 (Sec D)
37. Individual management plans shall conform to the appropriate policies and guidelines of the state land management plan and shall include, but not be limited to:	
A. A statement of the purpose for which the lands were acquired, the projected use or uses as defined in s. 253.034, and the statutory authority for such use or uses.	Pgs 1-3 (Sec 1.1)

Management Plan Compliance Checklist - Natural Resource Lands

Requirements	Page
B. Key management activities necessary to preserve and protect natural resources and restore habitat, and for controlling the spread of nonnative plants and animals, and for prescribed fire and other appropriate resource management activities.	Pgs 158-193 (Sec A.7, A.8, A.9 & Tbl 10)
C. A specific description of how the managing agency plans to identify, locate, protect, and preserve, or otherwise use fragile, nonrenewable natural and cultural resources.	Pgs 41, 99-102, 163-172, 168 (Sec 4.2.11, 6.5-obj. 30, A.9-beach mouse trapping)
D. A priority schedule for conducting management activities, based on the purposes for which the lands were acquired.	Pgs 173-193 (Tbl 10)
E. A cost estimate for conducting priority management activities, to include recommendations for cost-effective methods of accomplishing those activities. <i>Using categories as adopted pursuant to 259.037, F.S. is suggested. These are: (1) Resource Management; (2) Administration; (3) Support; (4) Capital Improvements; (5) Visitor Services/Recreation; and (6) Law Enforcement.</i>	Pgs 105-118, 172-193 (Chs 7 & 8, A.11, Tbl 10)
F. A cost estimate for conducting other management activities which would enhance the natural resource value or public recreation value for which the lands were acquired. The cost estimate shall include recommendations for cost-effective methods of accomplishing those activities. <i>Using categories as adopted pursuant to 259.037, F.S. is suggested. These are: (1) Resource Management; (2) Administration; (3) Support; (4) Capital Improvements; (5) Visitor Services/Recreation; and (6) Law Enforcement.</i>	Pgs 172-193 (Sec A.11, Tbl 10)
38. A determination of the public uses and public access that would be consistent with the purposes for which the lands were acquired.	Pgs 45-54 (Sec 4.3, 4.4, Tbl 2)
259.036 Management Review Teams.	
39. The managing agency shall consider the findings and recommendations of the land management review team in finalizing the required 10-year update of its management plan.	Pgs 194-202 (Sec A.13)
Other Requirements	
40. This checklist table (pursuant to request of ARC and consensus agreement of managing agencies.)	Pgs 127-129 (Sec A.2)
41. Accomplishments (implementation) from last plan (format variable by agency).	Pgs 55-67 (Ch 5)
42. FNAI-based natural community maps (may differ from FNAI in some cases).	Pg 33 (Fig 15)
43. Fire management plans (either by inclusion or reference) (259.032)	Pgs 163-172 (Sec A.9)
44. A <i>statement</i> regarding incompatible uses [ref. Ch. 253.034 (9)]	Pgs 45-48 (Sec 4.3 & Tbl 2)
45. Cultural resources, including maps of all sites <i>except Native American sites.</i>	Pgs 42-45 (Sec 4.2.15, Figs 16 & 17)

A.3 / FNAI Natural Communities (Rank and Status)

FNAI Community Type	Global Rank	State Rank	Federal Status	State Status	Location*
Basin swamp	G4	S3	N	N	GTM
Baygall	G4	S4	N	N	GTM
Beach dune	G3	S2	N	N	CAMA
Coastal grassland	G3	S2	N	N	CAMA
Coastal interdunal swale	G3	S2	N	N	CAMA
Coastal strand	G3	S2	N	N	CAMA
Depression marsh	G4	S4	N	N	CAMA
Dome swamp	G4	S4	N	N	GTM
Estuarine tidal marsh	G5	S4	N	N	CAMA
Floodplain swamp	G4	S4	N	N	CAMA
Hydric hammock	G4	S4	N	N	GTM
Maritime hammock	G3	S2	N	N	CAMA
Mesic flatwoods	G4	S4	N	N	CAMA
Sandhill	G3	S2	N	N	GTM
Scrub	G2	S2	N	N	CAMA
Scrubby flatwoods	G3	S3	N	N	GTM
Xeric hammock	G3	S3	N	N	CAMA

*CAMA: Found within the CAMA managed area; GTM: Found outside the CAMA managed area but within the GTM Research Reserve Boundary.

A.4 / FNAI Natural Communities Acreage

FNAI Community Type	CAMA Managed Acres	% of Area	Acres Under BTITF Lease	% of Area
Beach Dune	124	0.27	124	4.98
Coastal Strand	483	1.07	483	19.41
Mesic Flatwoods	17	0.04	17	0.68
Scrub	15	0.03	15	0.60
Shell Mound	76	0.17	76	3.05
Xeric Hammock	668	1.47	668	26.84
Depression Marsh	56	0.12	56	2.25
Coastal Interdunal Swale	27	0.06	27	1.08
Maritime Hammock	370	0.82	370	14.87
Tidal Marsh	8053	17.83	306.98	12.33
Tidal Swamp	346	0.77	346	13.90
Unconsolidated Substrate	2496	5.52		0.00
Ruderal	45	0.1		0.00
Open Water	31692	70.15		0.00
Not Mapped	709	1.57		0.00
Total Acreage	44468		2488.98	

A.5 / Species List

Common Name	Genus/Species
Kingdom Plantae	
Phylum Pterophyta (ferns)	
Carolina mosquito fern	<i>Azolla caroliniana</i>
Cinnamon fern	<i>Osmunda cinnamomea</i>
Royal fern	<i>Osmunda regalis</i>
Golden polypody	<i>Phlebodium aureum</i>
Resurrection fern	<i>Pleopeltis polypodioides</i> var. <i>michauxiana</i>
Lacy bracken	<i>Pteridium aquilinum</i> var. <i>caudatum</i>
Water fern	<i>Salvinia auriculata</i>
Southern shield fern	<i>Thelypteris kunthii</i>
Shoestring fern	<i>Vittaria lineata</i>
Netted chain fern	<i>Woodwardia areolata</i>
Virginia chain fern	<i>Woodwardia virginica</i>
Phylum Pinophyta (cone-bearing plants)	
Red cedar	<i>Juniperus virginiana</i>
Sand pine	<i>Pinus clausa</i>
Slash pine	<i>Pinus elliotii</i>
Longleaf pine	<i>Pinus palustris</i>
Pond pine	<i>Pinus serotina</i>
Loblolly pine	<i>Pinus taeda</i>
Pond cypress	<i>Taxodium ascendens</i>
Phylum Magnoliophyta (flowering plants)	
Class Liliopsida (grass-like flowering plants)	
Blue maidencane	<i>Amphicarpum muhlenbergianum</i>
Florida bluestem	<i>Andropogon floridanus</i>
Purple bluestem	<i>Andropogon glomeratus</i> var. <i>glaucopsis</i>
Bushy bluestem	<i>Andropogon glomeratus</i> var. <i>pumilus</i>
Broomsedge	<i>Andropogon longiberbis</i>
Splitbeard bluestem	<i>Andropogon ternarius</i>
Broomsedge bluestem	<i>Andropogon virginicus</i> var. <i>virginicus</i>
Green dragon	<i>Arisaema dracontium</i>
Wiregrass	<i>Aristida beyrichiana</i>
Woollysheath three-awn	<i>Aristida lanosa</i>
Bottlebrush three-awn	<i>Aristida spiciformis</i>
Switchcane	<i>Arundinaria gigantea</i>

Common Name	Genus/Species
Switch cane	<i>Arundinaria tecta</i>
Common oat	<i>Avena fatua</i>
Bamboo	<i>Bambusa spp.</i>
Capillary hairsedge	<i>Bulbostylis ciliatifolia</i>
Sandyfield hairsedge	<i>Bulbostylis stenophylla</i>
Greenwhite sedge	<i>Carex albolutescens</i>
Sandywoods sedge	<i>Carex dasycarpa</i>
Hammock sedge	<i>Carex fissa var. aristata</i>
Long's sedge	<i>Carex longii</i>
Blackedge sedge	<i>Carex nigromarginata</i>
Southern sandspur	<i>Cenchrus echinatus</i>
Coastal sandspur	<i>Cenchrus incertus</i>
Sanddune sandspur	<i>Cenchrus tribuloides</i>
Slender woodoats	<i>Chasmanthium laxum var. laxum</i>
Spanglegrass	<i>Chasmanthium laxum var. sessiliflorum</i>
Sawgrass	<i>Cladium jamaicense</i>
Whitemouth dayflower	<i>Commelina erecta</i>
Spring coralroot	<i>Corallorhiza wisteriana</i>
Bermudagrass	<i>Cynodon dactylon</i>
	<i>Cyperus brevifolius</i>
Baldwin's flatsedge	<i>Cyperus croceus</i>
Swamp flatsedge	<i>Cyperus distinctus</i>
Yellow nutgrass	<i>Cyperus esculentus</i>
Umbrella sedge	<i>Cyperus filicinus</i>
Globe sedge	<i>Cyperus globulosus</i>
Haspan flatsedge	<i>Cyperus haspan</i>
Fragrant flatsedge	<i>Cyperus odoratus</i>
Manyspike flatsedge	<i>Cyperus polystachyos</i>
Pinebarren flatsedge	<i>Cyperus retrorsus</i>
Nutgrass	<i>Cyperus rotundus</i>
Strawcolored flatsedge	<i>Cyperus strigosus</i>
Tropical flatsedge	<i>Cyperus surinamensis</i>
Fourangle flatsedge	<i>Cyperus tetragonus</i>
Crowfootgrass	<i>Dactyloctenium aegyptium</i>
Panicum	<i>Dicanthelium erectifolium</i>
Variable witchgrass	<i>Dichantheium commutatum</i>
Forked witchgrass	<i>Dichantheium dichotomum</i>
Hemlock witchgrass	<i>Dichantheium portoricense</i>
	<i>Dichantheium sabulorum</i>
Southern crabgrass	<i>Digitaria ciliaris</i>
Slender crabgrass	<i>Digitaria filiformis var. filiformis</i>
Shaggy crabgrass	<i>Digitaria villosa</i>
Saltgrass	<i>Distichlis spicata</i>
Coast cockspur	<i>Echinochloa walteri</i>
Baldwin's spikerush	<i>Eleocharis baldwinii</i>
Yellow spikerush	<i>Eleocharis flavescens</i>
Sand spikerush	<i>Eleocharis montevidensis</i>
Viviparous spikerush	<i>Eleocharis vivipara</i>
Indian goosegrass	<i>Eleusine indica</i>
Green-fly orchid	<i>Epidendrum magnoliae var. magnoliae</i>
Purple lovegrass	<i>Eragrostis spectabilis</i>
Coastal lovegrass	<i>Eragrostis virginica</i>
Centipedegrass	<i>Eremochloa ophiuroides</i>
Pinewoods fingergrass	<i>Eustachys petraea</i>
Slender fimbry	<i>Fimbristylis autumnalis</i>
Carolina fimbry	<i>Fimbristylis caroliniana</i>
Chesnut sedge	<i>Fimbristylis castanea</i>
Marsh fimbry	<i>Fimbristylis spadicea</i>
Fringe rush	<i>Fimbristylis vahlii</i>

Common Name	Genus/Species
Dwarf umbrellasedge	<i>Fuirena pumila</i>
Southern umbrellasedge	<i>Fuirena scirpoidea</i>
Waterspider orchid	<i>Habenaria repens</i>
Watergrass	<i>Hydrochloa carliniensis</i>
Fringed yellow stargrass	<i>Hypoxis juncea</i>
Blue flag	<i>Iris virginica</i>
Tapertip rush	<i>Juncus acuminatus</i>
Leathery rush	<i>Juncus coriaceus</i>
Forked rush	<i>Juncus dichotomus</i>
Soft rush	<i>Juncus effusus</i>
Bog rush	<i>Juncus elliotii</i>
Shore rush	<i>Juncus marginatus</i>
Bighead rush	<i>Juncus megacephalus</i>
Manyhead rush	<i>Juncus polycephalus</i>
Creeping rush	<i>Juncus repens</i>
Black needle rush	<i>Juncus roemerianus</i>
Shortleaf spikesedge	<i>Kyllinga brevifolia</i>
Carolina redroot	<i>Lachnanthes caroliniana</i>
Bogbuttons	<i>Lachnocaulon spp.</i>
Southern cutgrass	<i>Leersia hexandra</i>
Duckweed	<i>Lemna valdiviana</i>
Bearded spangletop	<i>Leptochloa fascicularis</i>
Frog's-bit; American spongeplant	<i>Limnobium spongia</i>
Italian ryegrass	<i>Lolium perenne</i>
Southern watergrass	<i>Luziola fluitans</i>
Big moss	<i>Mayaca fluviatilis</i>
Gulf hairawn muhly	<i>Muhlenbergia capillaris var. filipes</i>
Marine naiad	<i>Najas marina</i>
Southern naiad	<i>Najas quadalupenis</i>
Woodsgrass	<i>Oplismenus hirtellus</i>
Bitter panicgrass	<i>Panicum amarum</i>
Beaked panicum	<i>Panicum anceps</i>
Fall panicgrass	<i>Panicum dichotomiflorum</i>
Maidencane	<i>Panicum hemitomom</i>
Guineagrass	<i>Panicum maximum</i>
Torpedograss	<i>Panicum repens</i>
Redtop panicum	<i>Panicum rigidulum</i>
Bluejoint panicum	<i>Panicum tenerum</i>
Warty panicgrass	<i>Panicum verrucosum</i>
Switchgrass	<i>Panicum virgatum</i>
Bull paspalum	<i>Paspalum boscianum</i>
Bahiagrass	<i>Paspalum notatum var. sauriae</i>
Thin paspalum	<i>Paspalum setaceum</i>
Vaseygrass	<i>Paspalum urvillei</i>
Pearl millet	<i>Pennisetum americanum</i>
Blackseed needlegrass	<i>Piptochaetium avenaceum</i>
Annual bluegrass	<i>Poa annua</i>
Rabbitsfootgrass	<i>Polypogon monspeliensis</i>
Pickerelweed	<i>Pontederia cordata</i>
Sago pondweed	<i>Potamogeton pectinatus</i>
Giant orchid	<i>Pteroglossapsis ecristata</i>
Rose natalgrass	<i>Rhynchelytrum repens</i>
Anglestem beaksedge	<i>Rhynchospora caduca</i>
Starrush whitetop	<i>Rhynchospora colorata</i>
Shortbristle horned beaksedge	<i>Rhynchospora corniculata</i>
Fascicled beaksedge	<i>Rhynchospora fascicularis</i>
Threadleaf beaksedge	<i>Rhynchospora filifolia</i>
Sandyfield beaksedge	<i>Rhynchospora megalocarpa</i>
Southern beaksedge	<i>Rhynchospora microcarpa</i>

Common Name	Genus/Species
Bunched beaksedge	<i>Rhynchospora microcephala</i>
Bald rush	<i>Rhynchospora nitens</i>
Widgeon grass	<i>Ruppia maritima</i>
Cabbage palm; Sabal palm	<i>Sabal palmetto</i>
Sugarcane plumegrass	<i>Saccharum giganteum</i>
American cupscale	<i>Sacciolepis striata</i>
Floating leaf sagittaria	<i>Sagittaria filiformis</i>
Grassy arrowhead	<i>Sagittaria graminea</i> var. <i>graminea</i>
Little bluestem	<i>Schizachyrium scoparium</i> var. <i>scoparium</i>
Saltmarsh bulrush	<i>Schoenoplectus robustus</i>
Soft stem bulrush	<i>Schoenoplectus tabernaemontani</i>
Woolgrass	<i>Scirpus cyperinus</i>
Netted nutrush	<i>Scleria reticularis</i>
Tall nutgrass	<i>Scleria triglomerata</i>
Saw palmetto	<i>Serenoa repens</i>
Giant foxtail; Giant bristlegrass	<i>Setaria magna</i>
Knotroot foxtail	<i>Setaria parviflora</i>
Pointed blue-eyed grass	<i>Sisyrinchium angustifolium</i>
Annual blue-eyed grass	<i>Sisyrinchium rosulatum</i>
Earleaf greenbrier	<i>Smilax auriculata</i>
Saw greenbrier	<i>Smilax bona-nox</i>
Cat greenbrier; Wild sarsaparilla	<i>Smilax glauca</i>
Sarsaparilla vine	<i>Smilax pumila</i>
Hog brier; Bristly greenbrier	<i>Smilax tamnoides</i>
Lopsided Indiangrass	<i>Sorghastrum secundum</i>
Smooth cordgrass	<i>Spartina alterniflora</i>
Smooth cordgrass; Saltmarsh cordgrass	<i>Spartina alterniflora</i> var. <i>glabra</i>
Sand cordgrass	<i>Spartina bakeri</i>
Marshhay cordgrass; Saltmeadow cordgrass	<i>Spartina patens</i>
Prairie wedgescale	<i>Sphenopholis obtusata</i>
Ladies'-tresses	<i>Spiranthes praecox</i>
Woodland ladies'-tresses	<i>Spiranthes sylvatica</i>
Spring ladies'-tresses	<i>Spiranthes vernalis</i>
Duckmeat; Dotted duckweed	<i>Spirodela punctata</i>
Smutgrass	<i>Sporobolus indicus</i> var. <i>indicus</i>
Seashore dropseed	<i>Sporobolus virginicus</i>
St. Augustine grass	<i>Stenotaphrum secundatum</i>
Yellow hatpins	<i>Syngonanthus flavidulus</i>
Bartram's airplant	<i>Tillandsia bartramii</i>
Ballmoss	<i>Tillandsia recurvata</i>
Southern needleleaf	<i>Tillandsia setacea</i>
Spanish moss	<i>Tillandsia usneoides</i>
Bluejacket; Ohio spiderwort	<i>Tradescantia ohiensis</i>
Purpletop; Tall redtop	<i>Tridens flavus</i> var. <i>flavus</i>
Arrowgrass	<i>Triglochin striata</i>
Purple sandgrass	<i>Triplasis purpurea</i>
Narrow-leaved cattail	<i>Typha angustifolia</i>
Tropical cattail	<i>Typha domingensis</i>
Broadleaf cattail	<i>Typha latifolia</i>
Sea oat	<i>Uniola paniculata</i>
Sixweeks fescue	<i>Vulpia octoflora</i>
Bog mat	<i>Wolffiella gladiata</i>
Shortleaf yelloweyed grass	<i>Xyris brevifolia</i>
Richard's yelloweyed grass	<i>Xyris jupicai</i>
Spanish bayonet	<i>Yucca aloifolia</i>
Lawn orchid	<i>Zeuxine strateumatica</i>
Class Magnoliopsida (woody flowering plants)	
Slender threeseed mercury	<i>Acalypha gracilens</i>
Red maple	<i>Acer rubrum</i>

Common Name	Genus/Species
Shyleaf; Joint-vetch	<i>Aeschynomene americana</i>
	<i>Agalinis fasciculata</i>
Hammock snakeroot	<i>Ageratina jucunda</i>
Alligatorweed	<i>Alternanthera philoxeroides</i>
Southern amaranth	<i>Amaranthus australis</i>
Pigweed	<i>Amaranthus spp.</i>
Common ragweed	<i>Ambrosia artemisiifolia</i>
Fly poison	<i>Amianthium muscaetoxicum</i>
Toothcup	<i>Ammannia latifolia</i>
False indigo	<i>Amorpha fruticosa</i>
Peppervine	<i>Ampelopsis arborea</i>
Devil's walkingstick	<i>Aralia spinosa</i>
Mexican pricklypoppy	<i>Argemone mexicana</i>
Savannah milkweed	<i>Asclepias pedicellata</i>
Velvetleaf milkweed	<i>Asclepias tomentosa</i>
Smallflower pawpaw	<i>Asimina parviflora</i>
Climbing aster	<i>Aster carolinianus</i>
Rice button aster	<i>Aster dumosus</i>
Swamp aster; Elliott's aster	<i>Aster elliotii</i>
Annual saltmarsh aster	<i>Aster subulatus</i>
Perennial saltmarsh aster	<i>Aster tenuifolius</i>
Whitewort aster; Dixie aster	<i>Aster tortifolius</i>
Walter's aster	<i>Aster walteri</i>
Sea beach atriplex	<i>Atriplex arenaria</i>
Crested saltbush; Seabeach orach	<i>Atriplex pentandra</i>
Black mangrove	<i>Avicennia germinans</i>
Saltwater falsewillow	<i>Baccharis angustifolia</i>
Silverling	<i>Baccharis glomeruliflora</i>
Salt bush; Groundsel tree; Sea myrtle	<i>Baccharis halimifolia</i>
Blue waterhyssop	<i>Bacopa caroliniana</i>
Smooth waterhyssop; Herb of grace	<i>Bacopa monnieri</i>
Saltwort; Turtleweed	<i>Batis maritima</i>
Tarflower	<i>Bejaria racemosa</i>
Rattan vine	<i>Berchemia scandens</i>
Beggarticks	<i>Bidens alba</i>
Spanish needle	<i>Bidens bipinnata</i>
Burrmarigold	<i>Bidens laevis</i>
Crossvine	<i>Bignonia capreolata</i>
False nettle; Bog hemp	<i>Boehmeria cylindrica</i>
Red spiderling; Wineflower	<i>Boerhavia diffusa</i>
Bushy seaside oxeye	<i>Borrchia frutescens</i>
American bluehearts	<i>Buchnera americana</i>
Tough bumelia	<i>Bumelia tenax</i>
American searocket	<i>Cakile edentula subsp. harperi</i>
American beautyberry; French mulberry	<i>Callicarpa americana</i>
Matted waterstarwort	<i>Callitriche peploides</i>
Trumpet creeper	<i>Campsis radicans</i>
Bittercress	<i>Cardamine hirsuta</i>
Pennsylvania bittercress	<i>Cardamine pennsylvanica</i>
Thistle	<i>Carduus spp.</i>
Vanillaleaf	<i>Carphephorus odoratissimus</i>
Pignut hickory	<i>Carya glabra</i>
Wild sensitive plant	<i>Cassia nictitans</i>
Sicklepod	<i>Cassia obtusifolia</i>
Sugarberry; Hackberry	<i>Celtis laevigata</i>
Spadeleaf; Coinwort	<i>Centella asiatica</i>
Spurred Butterfly pea	<i>Centrosema virginianum</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Florida rosemary; Sand heath	<i>Ceratiola ericoides</i>

Common Name	Genus/Species
Coontail	<i>Ceratophyllum</i> spp.
Partridge pea	<i>Chamaecrista fasciculata</i>
Sensitive pea	<i>Chamaecrista nictitans</i> var. <i>aspera</i>
Dixie sandmat	<i>Chamaesyce bombensis</i>
Eyebane; Hyssopleaf sandmat	<i>Chamaesyce hyssopifolia</i>
Spotted sandmat	<i>Chamaesyce maculata</i>
Lamb's-quarters	<i>Chenopodium album</i>
Mexican tea; Pigweed	<i>Chenopodium ambrosioides</i>
Bull thistle; Yellow thistle	<i>Cirsium horridulum</i>
Nuttall's thistle	<i>Cirsium nuttallii</i>
Sour orange	<i>Citrus aurantium</i>
Butterfly pea; Atlantic pigeonwings	<i>Clitoria mariana</i>
Stinging nettle; Tread-softly; Finger-rot	<i>Cnidoscolus stimulosus</i>
Dwarf Canadian horseweed	<i>Conyza canadensis</i> var. <i>pusilla</i>
Golden tickseed	<i>Coreopsis tinctoria</i>
Swamp dogwood	<i>Cornus stricta</i>
Pursh's rattlebox	<i>Crotalaria purshii</i>
Rabbitbells	<i>Crotalaria rotundifolia</i>
Showy rattlebox	<i>Crotalaria spectabilis</i>
Hogwort; Woolly croton	<i>Croton capitatus</i>
Vente conmigo	<i>Croton glandulosus</i>
Beach tea; Gulf croton	<i>Croton punctatus</i>
Colombian waxweed	<i>Cuphea carthagenensis</i>
Compact dodder	<i>Cuscuta compacta</i>
Bigseed alfalfa dodder	<i>Cuscuta indecora</i>
Gulfcoast swallowwort	<i>Cynanchum angustifolium</i>
Western tansymustard	<i>Descurainia pinnata</i>
Hoary ticktrefoil; Beggarweed	<i>Desmodium incanum</i>
Panicledleaf ticktrefoil	<i>Desmodium paniculatum</i>
Dixie ticktrefoil	<i>Desmodium tortuosum</i>
Threeflower ticktrefoil	<i>Desmodium triflorum</i>
Carolina ponysfoot	<i>Dichondra caroliniensis</i>
Poor Joe	<i>Diodia teres</i>
Virginia buttonweed	<i>Diodia virginiana</i>
Common persimmon	<i>Diospyros virginiana</i>
Wedgeleaf whitlowgrass	<i>Draba cuneifolia</i>
Dwarf sundew	<i>Drosera brevifolia</i>
Pink sundew	<i>Drosera capillaris</i>
Oblong twinflower	<i>Dyschrste oblongifolia</i>
False daisy	<i>Eclipta prostrata</i>
Tall elephantsfoot	<i>Elephantopus elatus</i>
Fireweed	<i>Erechtites hieracifolia</i>
Oakleaf fleabane	<i>Erigeron quercifolius</i>
Baldwin's eryngo	<i>Eryngium baldwinii</i>
Coralbean; Cherokee bean	<i>Erythrina herbacea</i>
Coastal white snakeroot	<i>Eupatorium aromaticum</i>
Dog fennel	<i>Eupatorium capillifolium</i>
Yankeeweed	<i>Eupatorium compositifolium</i>
Falsefennel	<i>Eupatorium leptophyllum</i>
Mohr's thoroughwort	<i>Eupatorium mohrii</i>
Roundleaf thoroughwort	<i>Eupatorium rotundifolium</i>
Lateflowering thoroughwort	<i>Eupatorium serotinum</i>
Slender goldenrod	<i>Euthamia caroliniana</i>
Flat-topped goldenrod	<i>Euthamia minor</i>
Florida swampprivet	<i>Forestiera segregata</i>
Firewheel; Blanketflower	<i>Gaillardia pulchella</i>
Elliott's milkpea	<i>Galactia elliotii</i>
Eastern milkpea	<i>Galactia regularis</i>
Downy milkpea	<i>Galactia volubilis</i>

Common Name	Genus/Species
Coastal bedstraw	<i>Galium hispidulum</i>
Stiff marsh bedstraw	<i>Galium tinctorium</i>
Southern beeblossom	<i>Gaura angustifolia</i>
Dwarf huckleberry	<i>Gaylussacia dumosa</i>
Blue huckleberry	<i>Gaylussacia frondosa</i> var. <i>tomentosa</i>
Dangleberry	<i>Gaylussacia nana</i>
Yellow jessamine	<i>Gelsemium sempervirens</i>
Carolina cranesbill	<i>Geranium carolinianum</i>
Narrowleaf purple everlasting	<i>Gnaphalium falcatum</i>
Rabbit tobacco; Sweeteverlasting	<i>Gnaphalium obtusifolium</i>
Pennsylvania everlasting	<i>Gnaphalium pennsylvanicum</i>
Loblolly bay	<i>Gordonia lasianthus</i>
Rough hedgehyssop	<i>Gratiola hispida</i>
Hedge hyssop	<i>Gratiola ramosa</i>
Innocence; Fairy footprints	<i>Hedyotis procumbens</i>
Clustered mille grains	<i>Hedyotis uniflora</i>
Pinebarren frostweed; Rock-rose	<i>Helianthemum corymbosum</i>
East coast dune sunflower	<i>Helianthus debilis</i> subsp. <i>Debilis</i>
Camphorweed	<i>Heterotheca subaxillaris</i>
Swamp rosemallow	<i>Hibiscus grandiflorus</i>
Queendevil	<i>Hieracium gronovii</i>
Largeleaf marshpennywort	<i>Hydrocotyle bonariensis</i>
Manyflower marshpennywort	<i>Hydrocotyle umbellata</i>
Whorled marshpennywort	<i>Hydrocotyle verticillata</i> var. <i>verticillata</i>
Bedstraw St. John's-wort	<i>Hypericum galioides</i>
Roundpod St. John's-wort	<i>Hypericum cistifolium</i>
Pinweeds; Orangegrass	<i>Hypericum gentianoides</i>
St. Andrew's-cross	<i>Hypericum hypericoides</i>
Dwarf St. John's-wort	<i>Hypericum mutilum</i>
Myrtleleaf St. John's-wort	<i>Hypericum myrtifolium</i>
Naked St. John's-wort	<i>Hypericum nudiflorum</i>
Atlantic St. John's-wort	<i>Hypericum reductum</i>
St. Peter's-wort	<i>Hypericum stans</i>
Fourpetal St. John's-wort	<i>Hypericum tetrapetalum</i>
Carolina holly; Sand holly	<i>Ilex ambigua</i> var. <i>ambigua</i>
Dahoon	<i>Ilex cassine</i> var. <i>cassine</i>
Large gallberry	<i>Ilex coriacea</i>
Inkberry; Gallberry	<i>Ilex glabra</i>
American holly	<i>Ilex opaca</i> var. <i>opaca</i>
Yaupon	<i>Ilex vomitoria</i>
Hairy indigo	<i>Indigofera hirsuta</i>
Trailing indigo	<i>Indigofera spicata</i>
Woody indigo	<i>Indigofera suffruticosa</i>
Tievine	<i>Ipomoea cordatotriloba</i>
Beach morning glory	<i>Ipomoea imperati</i>
Man-of-the-Earth; Wild potato vine	<i>Ipomoea pandurata</i>
Railroad vine; Bayhops	<i>Ipomoea pes-caprae</i> var. <i>brasiliensis</i>
Saltmarsh morning glory	<i>Ipomoea sagittata</i>
Beach morning glory	<i>Ipomoea stolonifera</i>
Littlebell	<i>Ipomoea triloba</i>
Standing cypress; Spanish larkspur	<i>Ipomopsis rubra</i>
Juba's bush; Bloodleaf	<i>Iresine diffusa</i>
Marsh elder	<i>Iva frutescens</i>
Seacoast marsh elder	<i>Iva imbricata</i>
Piedmont marsh elder	<i>Iva microcephala</i>
Virginia saltmarsh mallow	<i>Kosteletzkya virginica</i>
Virginia dwarf dandelion	<i>Krigia virginica</i>
Woodland lettuce	<i>Lactuca floridana</i>
Grassleaf lettuce	<i>Lactuca graminifolia</i>

Common Name	Genus/Species
Lantana; Shrub verbena	<i>Lantana camara</i>
Hairy pinweed	<i>Lechea mucronata</i>
Pin weed	<i>Lechea racemulosa</i>
Virginia pepperweed	<i>Lepidium virginicum</i>
Hairy bush clover	<i>Lespedeza hirta</i>
Slender gayfeather	<i>Liatris gracilis</i>
Gopher apple	<i>Licania michauxii</i>
Japanese privet	<i>Ligustrum japonicum</i>
Carolina sea lavender	<i>Limonium carolinianum</i>
Canada toadflax	<i>Linaria canadensis</i>
Florida toadflax	<i>Linaria floridana</i>
Yellowseed false pimpernel	<i>Lindernia dubia</i> var. <i>anagallidea</i>
Moistbank false pimpernel	<i>Lindernia dubia</i> var. <i>dubia</i>
Carpetweed	<i>Lippia nodiflora</i>
Sweetgum	<i>Liquidambar styraciflua</i>
Lobelia	<i>Lobelia nuttallii</i>
Curtiss' primrosewillow	<i>Ludwigia curtissii</i>
Seaside primrosewillow	<i>Ludwigia maritima</i>
Mexican primrosewillow	<i>Ludwigia octovalvis</i>
Creeping primrosewillow	<i>Ludwigia repens</i>
Shrubby primrosewillow	<i>Ludwigia suffruticosa</i>
Christmasberry	<i>Lycium carolinianum</i>
Rusty lyonia; Crooked wood; Rusty staggerbush	<i>Lyonia ferruginea</i>
Coastalplain staggerbush	<i>Lyonia fruticosa</i>
Fetterbush; Shiny lyonia	<i>Lyonia lucida</i>
Wild bushbean	<i>Macroptilium lathyroides</i>
Southern magnolia	<i>Magnolia grandiflora</i>
Sweetbay	<i>Magnolia virginiana</i>
Angularfruit milkvine	<i>Matelea gonocarpa</i>
Black medick	<i>Medicago lupulina</i>
Burclover	<i>Medicago polymorpha</i>
Chinaberry	<i>Melia azedarach</i>
White sweetclover	<i>Melilotus albus</i>
Indian sweetclover	<i>Melilotus indicus</i>
Creeping cucumber	<i>Melothria pendula</i>
Alamo vine; Noyau vine	<i>Merremia dissecta</i>
Shade mudflower; Globifera	<i>Micranthemum umbrosum</i>
Florida Keys hempvine	<i>Mikania cordifolia</i>
Climbing hempvine	<i>Mikania scandens</i>
Sensitive brier	<i>Mimosa quadrivalvis</i>
Spotted beebalm; Spotted horsemint	<i>Monarda punctata</i>
Indianpipe	<i>Monotropa uniflora</i>
Pigmypipes	<i>Monotropis reynoldsiae</i>
Red mulberry	<i>Morus rubra</i>
Wax myrtle; Southern bayberry	<i>Myrica cerifera</i>
Cutleaf watermilfoil; Green parrot's-feather	<i>Myriophyllum pinnatum</i>
American white waterlily	<i>Nymphaea odorata</i>
Swamp tupelo	<i>Nyssa sylvatica</i> var. <i>biflora</i>
Seabeach evening primrose	<i>Oenothera humifusa</i>
Cutleaf evening primrose	<i>Oenothera laciniata</i>
Devil joint; Cockspur pricklypear	<i>Opuntia pusilla</i>
Erect pricklypear	<i>Opuntia stricta</i>
Wild olive; Devilwood	<i>Osmanthus americanus</i>
Yellow woodsorrel	<i>Oxalis corniculata</i>
Violet wood sorrel	<i>Oxalis corymbosa</i>
Wood sorrell	<i>Oxalis florida</i>
Yellow wood sorrel	<i>Oxalis stricta</i>
Florida pellitory	<i>Parietaria floridana</i>
Baldwin's nailwort	<i>Paronychia baldwinii</i>

Common Name	Genus/Species
Virginia creeper; Woodbine	<i>Parthenocissus quinquefolia</i>
Purple passionflower	<i>Passiflora incarnata</i>
Corkystem passionflower	<i>Passiflora suberosa</i>
Red bay	<i>Persea borbonia</i> var. <i>borbonia</i>
Swamp bay	<i>Persea palustris</i>
Oak mistletoe	<i>Phoradendron leucarpum</i>
Mistletoe	<i>Phoradendron serotinum</i>
Capeweed; Turkeytangle fogfruit	<i>Phyla nodiflora</i>
Drummond's leafflower	<i>Phyllanthus abnormis</i>
Chamber bitter	<i>Phyllanthus urinaria</i>
Walter's groundcherry	<i>Physalis walteri</i>
American pokeweed	<i>Phytolacca americana</i>
Pokeweed	<i>Phytolacca rigida</i>
Violet butterwort	<i>Pinguicula vulgaris</i>
Grassleaf goldenaster	<i>Pityopsis graminifolia</i>
English plantain	<i>Plantago lanceolata</i>
Virginia plantain	<i>Plantago virginica</i>
Camphorweed	<i>Pluchea camphorata</i>
Stinking camphorweed	<i>Pluchea foetida</i>
Saltmarsh fleabane	<i>Pluchea purpuracens</i>
Rosy camphorweed	<i>Pluchea rosea</i>
Painted-leaf; Fire-on-the-mountain	<i>Poinsettia cyathophora</i>
Polygala	<i>Polygala cymosa</i>
Procession flower	<i>Polygala incarnata</i>
Yellow milkwort	<i>Polygala lutea</i>
Orange milkwort	<i>Polygala nana</i>
Racemed milkwort	<i>Polygala polygama</i>
Hairy smartweed	<i>Polygonum hirsutum</i>
Mild waterpepper	<i>Polygonum hydropiperoides</i>
Dotted smartweed	<i>Polygonum punctatum</i>
Hairy leafcup	<i>Polymnia uvedalia</i>
Rustweed; Juniperleaf	<i>Polypremum procumbens</i>
Little hogweed	<i>Portulaca oleracea</i>
Pink purslane	<i>Portulaca pilosa</i>
Pink purslane; Kiss-me-quick	<i>Portulaca pilosa</i>
Combleaf mermaidweed	<i>Proserpinaca pectinata</i>
Carolina laurelcherry	<i>Prunus caroliniana</i>
Black cherry	<i>Prunus serotina</i> var. <i>serotina</i>
Flatwoods plum	<i>Prunus umbellata</i>
Common hoptree; Wafer ash	<i>Ptelea trifoliata</i>
Blackroot	<i>Pterocaulon pycnostachyum</i>
Mock bishopsweed	<i>Ptilimnium capillaceum</i>
Carolina desertchicory; False dandelion	<i>Pyrrhopappus carolinianus</i>
Chapman's oak	<i>Quercus chapmanii</i>
Sand live oak	<i>Quercus geminata</i>
Laurel oak; Diamond oak	<i>Quercus laurifolia</i>
Myrtle oak	<i>Quercus myrtifolia</i>
Water oak	<i>Quercus nigra</i>
Live oak	<i>Quercus virginiana</i>
Low spearwort	<i>Ranunculus pusillus</i>
Wild radish	<i>Raphanus raphanistrum</i>
Maryland meadowbeauty	<i>Rhexia mariana</i>
Winged sumac	<i>Rhus copallinum</i>
Climbing dollar-weed; Least snoutbean	<i>Rhynchosia minima</i>
Tropical Mexican clover	<i>Richardia brasiliensis</i>
Rough Mexican clover	<i>Richardia scabra</i>
Sawtooth blackberry	<i>Rubus argutus</i>
Sand blackberry	<i>Rubus cuneifolius</i>
Southern dewberry	<i>Rubus trivialis</i>

Common Name	Genus/Species
Carolina wild petunia	<i>Ruellia caroliniensis</i>
Hastateleaf dock	<i>Rumex hastatulus</i>
Swamp dock	<i>Rumex verticillatus</i>
Marsh pink	<i>Sabatia bartramii</i>
Shortleaf rosegentian	<i>Sabatia brevifolia</i>
Smallflower mock buckthorn	<i>Sageretia minutiflora</i>
Annual glasswort	<i>Salicornia bigelovii</i>
Perennial glasswort; Virginia glasswort	<i>Salicornia perennis</i>
Perennial glasswort	<i>Salicornia virginica</i>
Carolina willow	<i>Salix caroliniana</i>
Prickly Russian thistle	<i>Salsola kali subsp. pontica</i>
Tropical sage	<i>Salvia coccinea</i>
Lyreleaf sage	<i>Salvia lyrata</i>
American elder; Elderberry	<i>Sambucus canadensis</i>
Pineland pimpernel	<i>Samolus valerandi subsp. parviflorus</i>
Blacksnakeroot	<i>Sanicula canadensis</i>
Southern soapberry	<i>Sapindus saponaria</i>
Soapberry	<i>Sapindus saponaria</i>
Lizard's tail	<i>Saururus cernuus</i>
Sweetbroom	<i>Scoparia dulcis</i>
Sicklepod; coffeeweed	<i>Senna obtusifolia</i>
Bequilla	<i>Sesbania emerus</i>
Danglepod	<i>Sesbania herbacea</i>
Bladderpod; Bagpod	<i>Sesbania vesicaria</i>
Seapurslane	<i>Sesuvium portulacastrum</i>
Common wireweed; Common fanpetals	<i>Sida acuta</i>
Cuban jute; Indian hemp; Teaweed	<i>Sida rhombifolia</i>
Tough buckthorn	<i>Sideroxylon tenax</i>
Sleepy catchfly	<i>Silene antirrhina</i>
Horsenettle	<i>Solanum carolinense var. carolinense</i>
Black nightshade	<i>Solanum chenopodioides</i>
Tropical soda apple	<i>Solanum viarum</i>
Canada goldenrod	<i>Solidago canadensis var. scabra</i>
Pinebarren goldenrod	<i>Solidago fistulosa</i>
Chapman's goldenrod	<i>Solidago odora var. chapmanii</i>
Seaside goldenrod	<i>Solidago sempervirens</i>
Spiny sowthistle	<i>Sonchus asper</i>
Common sowthistle	<i>Sonchus oleraceus</i>
Shrubby false buttonweed	<i>Spermacoce verticillata</i>
Roughfruit scaleseed	<i>Spermolepis divaricata</i>
Florida betony; Florida hedgenettle	<i>Stachys floridana</i>
Trailing fuzzybean	<i>Strophostyles helvula</i>
Sea blite; Annual seepweed	<i>Suaeda linearis</i>
Wood sage; Canadian germander	<i>Teucrium canadense</i>
Eastern poison ivy	<i>Toxicodendron radicans</i>
Puncturevine	<i>Tribulus terrestris</i>
Forked bluecurls	<i>Trichostema dichotomum</i>
Hop clover	<i>Trifolium dubium</i>
White clover	<i>Trifolium repens</i>
Clasping Venus' looking-glass	<i>Triodanis perfoliata</i>
Humped bladderwort	<i>Utricularia gibba</i>
Floating bladderwort	<i>Utricularia inflata</i>
Eastern purple bladderwort	<i>Utricularia purpurea</i>
Little floating bladderwort	<i>Utricularia radiata</i>
Zigzag bladderwort	<i>Utricularia subulata</i>
Sparkleberry; Farkleberry	<i>Vaccinium arboreum</i>
Highbush blueberry	<i>Vaccinium corymbosum</i>
Shiny blueberry	<i>Vaccinium myrsinites</i>
Deerberry	<i>Vaccinium stamineum</i>

Common Name	Genus/Species
Woolly mullein	<i>Verbascum thapsus</i>
Wand mullein	<i>Verbascum virgatum</i>
Purpletop vervain	<i>Verbena bonariensis</i>
Brazilian vervain	<i>Verbena brasiliensis</i>
Texas vervain	<i>Verbena officinalis</i> var. <i>halei</i>
Harsh vervain	<i>Verbena scabra</i>
Frostweed; White crownbeard	<i>Verbesina virginica</i>
Giant ironweed	<i>Vernonia gigantea</i>
Fourleaf vetch	<i>Vicia acutifolia</i>
Hairy-pod cowpea	<i>Vigna luteola</i>
White violet	<i>Viola affinis</i>
Bog white violet	<i>Viola lanceolata</i>
Early blue violet	<i>Viola palmata</i>
Common blue violet	<i>Viola sororia</i>
Summer grape	<i>Vitis aestivalis</i>
Muscadine	<i>Vitis rotundifolia</i>
Southern rockbell	<i>Wahlenbergia marginata</i>
Hercules'-club	<i>Zanthoxylum clava-herculis</i>
Kingdom Animalia	
Phylum Porifera (sea sponges)	
Boring sponge	<i>Cliona</i> sp.
Purple sponge	<i>Haliclona permollis</i>
Sun sponge	<i>Hymeniacidon heliophila</i>
Red beard sponge	<i>Microciona prolifera</i>
Phylum Cnidaria (jellyfishes and anemones)	
Class Anthozoa (anemones and corals)	
Brown anemone	<i>Aiptasia pallida</i>
	<i>Anthopleura varioarmata</i>
Northern stony coral	<i>Astrangia danae</i>
Tricolor anemone	<i>Calliactis tricolor</i>
Sea tube anemone	<i>Ceriantheopsis americanus</i>
Sea whip	<i>Leptogorgia virgulata</i>
Sea pansy	<i>Renilla reniformis</i>
Class Hydrozoa (hydras)	
	<i>Ectopleura crocea</i>
Portugese man-of-war	<i>Physalia physalia</i>
	<i>Tubularia crocea</i>
Class Scyphozoa (jellyfishes)	
Moon jelly	<i>Aurelia aurita</i>
Sea nettle	<i>Chrysaora quinquecirrha</i>
Lions' mane medusa	<i>Cyanea capillata</i>
Cannonball jellyfish	<i>Stomolophus meleagris</i>
Phylum Ctenophora (comb jellies)	
	<i>Beroe</i> sp.
Sea walnut	<i>Mnemiopsis leidyi</i>
Sea gooseberry	<i>Pleurobrachia pileus</i>
Phylum Platyhelminthes (flatworms)	
Horseshoe crab worm	<i>Bdelloura candida</i>
Phylum Annelida (segmented worms)	
Parchment worm	<i>Chaetopterus variopedatus</i>
Tube worm	<i>Diopatra cuprea</i>
Blood worm	<i>Glycera americana</i>
Phylum Arthropoda (spiders, insects, crustaceans)	
Class Arachnida (spiders, scorpions, mites)	
Grass spider	<i>Agelenopsis</i>
Lone star tick	<i>Amblyomma americanum</i>
Black & yellow argiope	<i>Argiope aurantia</i>
Centruroides scorpion	<i>Centruroides</i> spp.
Florida striped bark scorpion	<i>Centruroides Hentzi</i>

Common Name	Genus/Species
Wood tick	<i>Dermacentor spp.</i>
Chigger; Redbug	<i>Eutrombicula spp.</i>
Crablike spiny orb weaver	<i>Gasteracantha spp.</i>
Brown widow spider	<i>Latrodectus geometricus</i>
Southern black widow spider	<i>Latrodectus mactans</i>
Giant vinegarone	<i>Mastigoproctus giganteus</i>
Golden silk spider	<i>Nephila clavipes</i>
Green lynx spider	<i>Peucetia viridans</i>
Brown daddy long legs	<i>Phalangium opilio</i>
Daring jumping spider	<i>Phidippus audax</i>
Sub-phylum Crustacea (shrimp, crabs, lobsters)	
Aviu shrimp	<i>Acetes americanus carolinae</i>
Snapping shrimp	<i>Alpheus heterochaelis</i>
Speckled swimming crab	<i>Arenaeus cribrarius</i>
Pillbug	<i>Armadillium spp.</i>
Square backed marsh crab	<i>Armases cinereum</i>
Acorn barnacle	<i>Semibalanus balanoides</i>
Common barnacle	<i>Balanus balanoides</i>
Ivory barnacle	<i>Balanus eburneus</i>
Barnacles	<i>Balanus spp.</i>
Flame box crab	<i>Calappa flammea</i>
Carolina ghost shrimp	<i>Callichirus major</i>
Red blue crab	<i>Callinectes bocourti</i>
Ornate blue crab	<i>Callinectes ornatus</i>
Blue crab	<i>Callinectes sapidus</i>
Lesser blue crab	<i>Callinectes similis</i>
Indo-Pacific swimming crab	<i>Charybdis hellerii</i>
Gray barnacle	<i>Chthamalus fragilis</i>
Striped hermit crab	<i>Clibanarius vittatus</i>
Say mud crab	<i>Dyspanopeus sayi</i>
Atlantic sand crab	<i>Emerita talpoida</i>
Flat mud crab	<i>Eurypanopeus depressus</i>
Broadback mud crab	<i>Eurytium limosum</i>
Brown shrimp	<i>Farfantepenaeus aztecus</i>
Pink shrimp	<i>Farfantepenaeus duorarum</i>
Scuds	<i>Gammarus spp.</i>
Calico crab	<i>Hepatus epheliticus</i>
Smooth mud crab	<i>Hexapanopeus augustifrons</i>
Veined shrimp	<i>Hippolysmata wurdemanni</i>
Duck barnacle	<i>Lepas anatifera</i>
Portly spider crab	<i>Libinia emarginata</i>
Wharf roach	<i>Ligia exotica</i>
White shrimp	<i>Litopenaeus setiferus</i>
	<i>Lucifer faxoni</i>
Cinnamon river shrimp	<i>Macrobrachium acanthurus</i>
Stone crab	<i>Menippe spp.</i>
Florida stone crab	<i>Menippe mercenaria</i>
Gulf stone crab	<i>Menippe adina</i>
Gulf grassflat crab	<i>Neopanope texana sayi</i>
Atlantic ghost crab	<i>Ocypode quadrata</i>
Mottled shore crab	<i>Pachygrapsus transversus</i>
Banded hermit crab	<i>Pagurus annulipes</i>
Long clawed hermit crab	<i>Pagurus longicarpus</i>
Flat-clawed hermit crab	<i>Pagurus pollicaris</i>
Hermit crab	<i>Pagurus spp.</i>
Daggerblade grass shrimp	<i>Palaemonetes pugio</i>
Panaeid shrimp	<i>Panaeus spp.</i>
Common mud crab	<i>Panopeus herbstii</i>
Furrowed mud crab	<i>Panopeus occidentalis</i>

Common Name	Genus/Species
Green porcelain crab	<i>Petrolisthes armatus</i>
Sea spider	<i>Phoxichilidium femoratum</i>
Tube pea crab	<i>Pinnixa chaetoptera</i>
	<i>Pinnixa retinens</i>
Mussel crab	<i>Pinnotheres maculatus</i>
Oyster crab	<i>Pinnotheres ostreum</i>
Tidal spray crab	<i>Plagusia depressa</i>
Eastern tube crab	<i>Polyonyx gibbesi</i>
Iridescent swimming crab	<i>Portunus gibbesii</i>
Sargassum crab	<i>Portunus sayi</i>
Blotched swimming crab	<i>Portunus spinimanus</i>
Crayish	<i>Procambarus spp.</i>
Estuarine mud crab	<i>Rhithropanopeus harrisii</i>
Wharf crab	<i>Sesarma cinereum</i>
Purple marsh crab	<i>Sesarma reticulatum</i>
Beach fleas	<i>Talorchestia spp.</i>
Arrow shrimp	<i>Tozeuma carolinense</i>
Mussel pea crab	<i>Tumidotheres maculatus</i>
Red-jointed fiddler	<i>Uca minax</i>
Sand fiddler crab	<i>Uca pugilator</i>
Atlantic marsh fiddler	<i>Uca pugnax</i>
Coastal mud shrimp	<i>Upogebia affinis</i>
Oyster pea crab	<i>Zaops ostreum</i>
Class Insecta (insects)	
Green stink bug	<i>Acrosternum hilare</i>
Luna moth	<i>Actias luna</i>
	<i>Aedes sollicitans</i>
Salt marsh mosquitos	<i>Aedes taeniorhynchus</i>
Virescent green metallic bee	<i>Agapostemon virescens</i>
Gulf fritillary	<i>Agraulis vanillae</i>
Pink spotted hawk moth	<i>Agrius cingulata</i>
Eastern eyed click beetle	<i>Alaus oculatus</i>
White peacock	<i>Anartia jatrophae</i>
Common green darner	<i>Anax junius</i>
Comet darner	<i>Anax longipes</i>
	<i>Anopheles</i>
Polyphemus moth	<i>Antheraea polyphemus</i>
Honeybee	<i>Apis mellifera</i>
Gray green clubtail	<i>Arigomphus pallidus</i>
Great southern white	<i>Ascia monuste</i>
Io moth	<i>Automeris io</i>
Pipevine swallowtail	<i>Battus philenor</i>
Love bug	<i>Bibio</i>
Bumblebee	<i>Bombus pennsylvanicus</i>
Four spotted pennant	<i>Brachymesia gravida</i>
Fieri searcher	<i>Calosoma scrutator</i>
Black carpenter ant	<i>Camponotus pennsylvanicus</i>
Halloween pennant	<i>Celithemis eponina</i>
Double ringed pennant	<i>Celithemis verna</i>
Deerflies	<i>Chrysops</i>
	<i>Coquillettidia</i>
Goldsmith beetle	<i>Cotalpa lanigera</i>
Sand flies	<i>Culicoides</i>
Monarch	<i>Danaus plexippus</i>
Virginia creeper sphinx	<i>Darapsa myron</i>
Cow killer	<i>Dasymutilla occidentalis</i>
Northern walking stick	<i>Diapheromera femorata</i>
Rosy maple moth	<i>Dryocampa rubicunda</i>
Eastern pond hawk	<i>Erythemis simplicicollis</i>

Common Name	Genus/Species
Blue dragonlet	<i>Erythrodiplax connata</i>
Little sulphur	<i>Eurema lisa</i>
Chigger	<i>Futrombicula spp.</i>
Field cricket	<i>Gryllus pennsylvanicus</i>
Small whirligig beetle	<i>Gyrinus spp.</i>
Ceraunus blue	<i>Hemiargus ceraunus</i>
Riparian earwig	<i>Labidura riparia</i>
Silverfish	<i>Lepisma saccharina</i>
Giant waterbug	<i>Lethocerus americanus</i>
Marl pennant	<i>Macrodiplax balteata</i>
Tent caterpillar moth	<i>Malacosoma americanum</i>
Freshwater mosquitos	<i>Mansonia spp.</i>
American carrion beetle	<i>Necrophila americana</i>
Northern mole cricket	<i>Neocurtilla hexadactyla</i>
Roseate skimmer	<i>Orthemis ferruginea</i>
Blue dasher	<i>Pachydiplax longipennis</i>
Wandering glider	<i>Pantala flavescens</i>
Giant swallowtail	<i>Papilio cressphontes</i>
Eastern tiger swallowtail	<i>Papilio glaucus</i>
Palamedes swallowtail	<i>Papilio palamedes</i>
American cockroach	<i>Periplaneta americana</i>
Scarab beetle	<i>Phanaeus vindex</i>
Cloudless sulphur	<i>Phoebis sennae</i>
Phaon crescent	<i>Phyciodes phaon</i>
Paper wasp	<i>Polistes spp.</i>
Giant root borer	<i>Prionus spp.</i>
	<i>Psorophora spp.</i>
Black ground beetle	<i>Pterostichus spp.</i>
Brown water scorpion	<i>Ranatra fusca</i>
Termite	<i>Reticulitermes flavipes</i>
Termites	<i>Reticulitermes flavipes</i>
Southeastern lubber grasshopper	<i>Romalea microptera</i>
Black/yellow mud dauber	<i>Sceliphron caementarium</i>
Fire ant	<i>Solenopsis wagneri</i>
Oleander moth	<i>Syntomeida epilais</i>
Horseflies	<i>Tabanus spp.</i>
Violet masked glider	<i>Tramea carolina</i>
Common buckey	<i>Unonia coenia</i>
Long tailed skipper	<i>Urbanus proteus</i>
Bella moth	<i>Utetheisa ornatrix bella</i>
American lady	<i>Vanessa virginiensis</i>
Yellowjacket	<i>Vespula spp.</i>
Carpenter bee	<i>Xylocopa virginica</i>
Tersa moth	<i>Xylophanes tersa</i>
Class Merostomata	
Horseshoe crab	<i>Limulus polyphemus</i>
Mantis shrimp	<i>Squilla empusa</i>
Class Gastropoda (snails)	
Sea hare	<i>Aplysia braziliana</i>
Striped sea slug	<i>Armina tigrina</i>
False cerith	<i>Batillaria minima</i>
Variable bittium	<i>Bittium varium</i>
West Indian bubble	<i>Bulla occidentalis</i>
Ragged sea hare	<i>Bursatella leachi</i>
Knobbed whelk	<i>Busycon carica</i>
Lightning whelk	<i>Busycon sinistrum</i>
Sculptured top-shell	<i>Calliostoma euglyptum</i>
Tinted cantharus	<i>Cantharus tinctus</i>
Ladder horn shell	<i>Cerithdea scalariformis</i>

Common Name	Genus/Species
Miniature cerith	<i>Cerithiopsis greeni</i>
Florida cerith	<i>Cerithium floridanum</i>
Spiny slipper shell	<i>Crepidula aculeata</i>
Atlantic slipper shell	<i>Crepidula fornicata</i>
Eastern white slipper shell	<i>Crepidula plana</i>
Giant atlantic cockle	<i>Dinocardium robustum</i>
Keyhole limpet	<i>Diodora cayenensis</i>
Angulate wentletrap	<i>Epitonium angulatum</i>
Banded tulip	<i>Fasciolaria hunteria</i>
True tulip	<i>Fasciolaria tulipa</i>
Mortons egg cockle	<i>Laevicardium mortoni</i>
Marsh periwinkle	<i>Littorina irrorata</i>
Zebra periwinkle	<i>Littorina ziczac</i>
Common marsh snail	<i>Melampus bidentatus</i>
Saltmarsh snail	<i>Melampus coffeus</i>
Crown conch	<i>Melongena corona</i>
Atlantic modulus	<i>Modulus modulus</i>
Mud snail	<i>Nassarius obsoletus</i>
Eastern nassa	<i>Nassarius vibex</i>
Olive nerite	<i>Neritina reclinata</i>
Virgin nerite	<i>Neritina virginea</i>
Impressed odostome	<i>Odostomia impressa</i>
Olive shell	<i>Oliva sayana</i>
Variable dwarf olive	<i>Olivella mutica</i>
Horse conch	<i>Pleuroploca gigantea</i>
Shark eye	<i>Polinices duplicatus</i>
Miniature cerith	<i>Seila adamsi</i>
False limpet	<i>Siphonaria pectinata</i>
Terrestrial gastropod	<i>Succinea campestris</i>
Florida rock shell	<i>Thais haemastoma floridana</i>
Black-lined trifora	<i>Triphora nigrocincta</i>
Chestnut turban	<i>Turbo castaneus</i>
Atlantic oyster drill	<i>Urosalpinx cinerea</i>
Class Polyplacophora (chitons)	
Eastern chiton	<i>Chaetopleura apiculata</i>
Class Bivalvia (clams, mussels, oysters)	
Common atlantic abra	<i>Abra aequalis</i>
Paper mussel	<i>Amygdalum papyria</i>
Greedy dove-shell	<i>Anachis avara</i>
Fat dove-shell	<i>Anachis obesa</i>
Transverse ark	<i>Anadara transversa</i>
Jingle shell	<i>Anomia simplex</i>
Zebra turkey wing	<i>Arca zebra</i>
Sawtooth pen clam	<i>Atrina serrata</i>
Angel wing	<i>Barnea costata</i>
Scorched mussel	<i>Brachidontes exustus</i>
Hooked mussel	<i>Brachidontes recurvus</i>
Cross-barred Venus	<i>Chione cancellata</i>
Conrad's false mussel	<i>Congerina leucophaeata</i>
Contracted vorbula	<i>Corbula contracta</i>
Eastern oyster	<i>Crassostrea virginica</i>
Angelwing clam	<i>Cyrtopleura costata</i>
Coquina clam	<i>Donax variabilis</i>
Disk dosinia	<i>Dosinia discus</i>
Jackknife clam	<i>Ensis minor</i>
Razor clams	<i>Ensis spp.</i>
Comb bittersweet	<i>Glycymeris pectinata</i>
Marsh mussel	<i>Guekensia demissa</i>
Ribbed mussel	<i>Ischadium demissum</i>

Common Name	Genus/Species
Mahogany date mussel	<i>Lithophaga bisulcata</i>
Calico clam	<i>Macrocallista maculata</i>
Wedge-shaped martesia	<i>Martesia cuneiformis</i>
Southern quahog	<i>Mercenaria campechiensis</i>
Quahog	<i>Mercenaria mercenaria</i>
Lunar dove-shell	<i>Mitrella lunata</i>
Dwarf surf clam	<i>Mulinia lateralis</i>
Pondersous ark	<i>Noetia ponderosa</i>
Crested oyster	<i>Ostrea equestris</i>
Atlantic geoduck	<i>Panopea bitruncata</i>
Carolina marsh clam	<i>Polymesoda caroliniana</i>
Florida marsh clam	<i>Pseudocyrena floridana</i>
Common rangia	<i>Rangia cuneata</i>
Purplish tagelus	<i>Tagelus divisus</i>
Stout tagelus	<i>Tagelus plebius</i>
Rose petal tellin	<i>Tellina lineata</i>
Class Cephalopoda (squids and octopus)	
Squid	<i>Loligunculus brevis</i>
Atlantic octopus	<i>Octopus vulgaris</i>
Phylum Bryozoa (Ectoprocta, moss animals)	
	<i>Zoobotryon verticillatum</i>
	<i>Alcyonidium hauffi</i>
	<i>Anguinella palmata</i>
	<i>Bugula neretina</i>
Encrusting bryozoan	<i>Membranipora tenuis</i>
Branching bryozoan	<i>Schizoporella errata</i>
Phylum Echinodermata (starfishes, sea urchins)	
Class Asteroidea (starfishes)	
Common starfish	<i>Asterias forbesi</i>
Margined sea star	<i>Astropecten articulatus</i>
Lines sea star	<i>Luidea clathrata</i>
Class Echnioidea (sea urchins)	
Purple spined sea urchin	<i>Arbacea punctulata</i>
Variable urchin	<i>Lytechinus variegatus</i>
Sand dollar	<i>Mellita quinquesperforata</i>
Class Holothuroidea (sea cucumbers)	
Common thylene	<i>Thyone briatus</i>
Class Ophiuroidea (brittle stars)	
	<i>Ophiothrix angulata</i>
Phylum Hemichordata (acorn worms)	
Southern acorn worm	<i>Ptychodera bahamensis</i>
Phylum Chordata (vertebrates and relatives)	
Class Ascidiacea (sea squirts)	
White didemnid	<i>Didemnum candidum</i>
Mangrove tunicate	<i>Ecteinascidia turbinata</i>
Sea grapes	<i>Molgula manhattensis</i>
Pleated sea squirt	<i>Styela plicata</i>
Sea pork	<i>Amaroucium stellatum</i>
Class Cephalochordata (lancelets)	
Caribbean lancelet	<i>Branchiostoma caribaeum</i>
Sub-phylum Vertebrata (vertebrates)	
Class Agnatha (jawless fishes)	
Sea lamprey	<i>Petromyzon marinus</i>
Class Chondrichthyes (cartilaginous fishes)	
Shortnose sturgeon	<i>Acipenser brevirostrum</i>
Gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>
Spinner shark	<i>Carcharhinus brevipinna</i>
Bull shark	<i>Carcharhinus leucas</i>
Blacktip shark	<i>Carcharhinus limbatus</i>

Common Name	Genus/Species
Sandbar shark	<i>Carcharhinus plumbeus</i>
Southern sting ray	<i>Dasyatis americana</i>
Atlantic stingray	<i>Dasyatis sabina</i>
Smooth butterfly ray	<i>Gymnura micrura</i>
Lemon shark	<i>Negaprion brevirostris</i>
Sand shark	<i>Odontaspis taurus</i>
Clearnose skate	<i>Raja eglanteria</i>
Atlantic guitarfish	<i>Rhinobatos lentiginosus</i>
Cownose ray	<i>Rhinoptera bonasus</i>
Hammerhead sharks	<i>Sphyrna spp.</i>
Scalloped hammerhead	<i>Sphyrna lewini</i>
Great hammerhead	<i>Sphyrna mokarran</i>
Bonnethead	<i>Sphyrna tiburo</i>
Super-class Osteichthyes (bony fishes)	
Sergeant major	<i>Abudefduf saxatilis</i>
Cowfish	<i>Acanthostracion quadricornis</i>
Lined sole	<i>Achirus lineatus</i>
Bonefish	<i>Albula vulpes</i>
Hickory shad	<i>Alosa mediocris</i>
	<i>Aluterus spp.</i>
Yellow bullhead	<i>Ameiurus natalis</i>
Bowfin	<i>Amia calva</i>
Striped anchovy	<i>Anchoa hepsetus</i>
Bay anchovy	<i>Anchoa mitchilli</i>
Anchovy	<i>Anchoa spp.</i>
Oscillated flounder	<i>Ancylopsetta quadrocellata</i>
American eel	<i>Anguilla rostrata</i>
Sheepshead	<i>Archosargus probatocephalus</i>
Sea catfish	<i>Ariopsis felis</i>
Southern stargazer	<i>Astroscopus y-graecum</i>
Gafftopsail catfish	<i>Bagre marinus</i>
Silver perch	<i>Bairdiella chrysoura</i>
Triggerfish	<i>Balistes spp.</i>
Frillfin goby	<i>Bathygobius soporator</i>
Atlantic menhaden	<i>Brevoortia tyrannus</i>
Yellow jack	<i>Carangoides bartholomaei</i>
Crevalle jack	<i>Caranx hippos</i>
Horse-eye jack	<i>Caranx latus</i>
Snook	<i>Centropomus undecimalis</i>
Rock sea bass	<i>Centropristis philadelphica</i>
Black sea bass	<i>Centropristis striata</i>
Atlantic spadefish	<i>Chaetodipterus faber</i>
Striped blenny	<i>Chasmodes bosquianus</i>
Florida blenny	<i>Chasmodes saburrae</i>
Atlantic bumper	<i>Chloroscombrus chrysurus</i>
Striped burrfish	<i>Cilomycterus schoepfi</i>
Spotted whiff	<i>Citharichthys macrops</i>
Bay whiff	<i>Citharichthys spilopterus</i>
Common dolphin	<i>Coryphaena hippurus</i>
Spotted sea trout	<i>Cynoscion nebulosus</i>
Atlantic weakfish	<i>Cynoscion regalis</i>
Sheepshead minnow	<i>Cyprinodon variegatus</i>
Irish pompano	<i>Diapterus auratus</i>
Striped mojarra	<i>Diapterus plumieri</i>
Balloon fish	<i>Diodon holocanthus</i>
Dwarf sand perch	<i>Diplectrum bivittatum</i>
Sand perch	<i>Diplectrum formosum</i>
Silver porgy	<i>Diplodus argenteus</i>
Spottail pinfish	<i>Diplodus holbrooki</i>

Common Name	Genus/Species
Gizzard shad	<i>Dorosoma cepedianum</i>
Threadfin shad	<i>Dorosoma petenense</i>
Sharksucker	<i>Echeneis naucrates</i>
Ladyfish	<i>Elops saurus</i>
Nassau grouper	<i>Ephinephelus striatus</i>
Goliath grouper	<i>Epinephelus itajara</i>
Groupers	<i>Epinephelus spp.</i>
Lake chubsucker	<i>Erimyzon sucetta</i>
Fringed flounder	<i>Etropus crossotus</i>
Silver jenny	<i>Eucinostomus gula</i>
Tidewater mojarra	<i>Eucinostomus harengulus</i>
Slender mojarra	<i>Eucinostomus jonesi</i>
Spotfin mojarra	<i>Eugerres plumieri</i>
Flying halfbeak	<i>Euleptorhamphus velox</i>
Little tunny	<i>Euthynnus alleteratus</i>
Golden topminnow	<i>Fundulus chrysotus</i>
Marsh killifish	<i>Fundulus confluentus</i>
Gulf killifish	<i>Fundulus grandis</i>
Mummichog	<i>Fundulus heteroclitus</i>
Striped killifish	<i>Fundulus majalis</i>
Longnose killifish	<i>Fundulus similis</i>
Tiger shark	<i>Galeocerdo cuvieri</i>
Mosquitofish	<i>Gambusia affinis</i>
Eastern mosquitofish	<i>Gambusia holbrooki</i>
Yellowfin mojarra	<i>Gerre cinereus</i>
Skilletfish	<i>Gobiesox strumosus</i>
Violet goby	<i>Gobioides broussonetii</i>
Darter goby	<i>Gobionellus boleosoma</i>
Highfin goby	<i>Gobionellus oceanicus</i>
Freshwater goby	<i>Gobionellus shufeldti</i>
Emerald goby	<i>Gobionellus smaragdus</i>
Marked goby	<i>Gobionellus stigmaticus</i>
Naked goby	<i>Gobiosoma bosc</i>
Twoscale goby	<i>Gobiosoma longipala</i>
Code goby	<i>Gobiosoma robustum</i>
Grunts	<i>Haemulon spp.</i>
Scaled sardine	<i>Harengula jaguana</i>
Least killifish	<i>Heterandria formosa</i>
Lined seahorse	<i>Hippocampus erectus</i>
Barred blenny	<i>Hypoleurochilus bermudensis</i>
American halfbeak	<i>Hyporhamphus meeki</i>
Feather blenny	<i>Hypsoblennius henz</i>
Brown bullhead	<i>Ictalurus nebulosus</i>
Florida flagfish	<i>Jordanella floridae</i>
Hairy blenny	<i>Labrisomus nuchipinnis</i>
Trunkfish	<i>Lactophrys trigonus</i>
Pinfish	<i>Lagodon rhomboides</i>
Warmouth	<i>Lepomis gulosus</i>
Banded drum	<i>Larimus fasciatus</i>
Spot	<i>Leiostomus xanthurus</i>
Longnose gar	<i>Lepisosteus osseus</i>
Redbreasted sunfish	<i>Lepomis auritus</i>
Bluegill	<i>Lepomis macrochirus</i>
Redear sunfish	<i>Lepomis microlophus</i>
Stumpknocker	<i>Lepomis punctatus</i>
Tripletail	<i>Lobotes surinamensis</i>
Red snapper	<i>Lutjanus campechanus</i>
Gray snapper	<i>Lutjanus griseus</i>
Lane snapper	<i>Lutjanus synagris</i>

Common Name	Genus/Species
Atlantic manta	<i>Manta birostris</i>
Tarpon	<i>Megalops atlanticus</i>
Rough silvereside	<i>Membras martinica</i>
Tidewater silverside	<i>Menidia beryllina</i>
Atlantic silverside	<i>Menidia menidia</i>
Silverside	<i>Menidia spp.</i>
Whiting	<i>Menticirrhus americanus</i>
Gulf kingfish	<i>Menticirrhus littoralis</i>
Northern kingfish	<i>Menticirrhus saxatilis</i>
Clown goby	<i>Microgobius gulosus</i>
Green goby	<i>Microgobius thalassinus</i>
Opposum pipefish	<i>Microphis brachyurus</i>
Atlantic croaker	<i>Micropogonias undulatus</i>
Largemouth bass	<i>Micropterus floridanus</i>
Filefish	<i>Monacanthus spp.</i>
Striped mullet	<i>Mugil cephalus</i>
White mullet	<i>Mugil curema</i>
Gag	<i>Myxoperca microlepis</i>
Speckled worm eel	<i>Myrophis punctatus</i>
Golden shiner	<i>Notemigonus crysoleucus</i>
Polka-dot batfish	<i>Ogcocephalus cubifrons</i>
Leatherjack	<i>Oligoplites saurus</i>
Shrimp eel	<i>Ophichthus gomesi</i>
	<i>Ophidion spp.</i>
Atlantic thread herring	<i>Opisthonema oglinum</i>
Oyster toadfish	<i>Opsanus tau</i>
Pigfish	<i>Orthopristis chrysoptera</i>
Gulf flounder	<i>Paralichthys albigutta</i>
Summer flounder	<i>Paralichthys dentatus</i>
Southern flounder	<i>Paralichthys lethostigma</i>
Broad flounder	<i>Paralichthys squamilentus</i>
Harvest fish	<i>Peprilus paru</i>
Sailfin molly	<i>Poecilia latipinna</i>
Mollies	<i>Poecilia spp.</i>
Blackdrum	<i>Pogonias cromis</i>
Bluefish	<i>Pomatomus saltatrix</i>
Northern searobin	<i>Prionotus carolinus</i>
Striped searobin	<i>Prionotus evolans</i>
Blackfin searobin	<i>Prionotus rubio</i>
Leopard searobin	<i>Prionotus scitulus</i>
Bighead searobin	<i>Prionotus tribulus</i>
Short bigeye	<i>Pristigenys alta</i>
Cobia	<i>Rachycentron canadum</i>
Remora	<i>Remora remora</i>
Bonito	<i>Sarda sarda</i>
Spanish sardine	<i>Sardinella aurita</i>
Red drum	<i>Sciaenops ocellatus</i>
King mackerel	<i>Scomberomorus cavalla</i>
Spanish mackerel	<i>Scomberomorus maculatus</i>
Barbfish	<i>Scorpaena brasiliensis</i>
Spotted scorpionfish	<i>Scorpaena plumieri</i>
Bigeye scad	<i>Selar crumenophthalmus</i>
Atlantic moonfish	<i>Selene setapinnis</i>
Lookdown	<i>Selene vomer</i>
Amberjack	<i>Seriola dumerili</i>
Florida puffer	<i>Sphoeroides nephelus</i>
Northern puffer	<i>Sphoeroides maculatus</i>
Southern puffer	<i>Sphoeroides nephelus</i>
Checkered puffer	<i>Sphoeroides testudineus</i>

Common Name	Genus/Species
Great barracuda	<i>Sphyraena barracuda</i>
Guaguanche	<i>Sphyraena guachancho</i>
Star drum	<i>Stellifer lanceolatus</i>
Planehead filefish	<i>Stephanolepis hispida</i>
Atlantic needlefish	<i>Strongylura marina</i>
Redfin needlefish	<i>Strongylura notata</i>
Blackcheek tonguefish	<i>Symphurus plagiusa</i>
Dusky pipefish	<i>Syngnathus floridae</i>
Northern pipefish	<i>Syngnathus fuscus</i>
Chain pipefish	<i>Syngnathus louisianae</i>
Gulf pipefish	<i>Syngnathus scovelli</i>
Inshore lizardfish	<i>Synodus foetens</i>
Florida pompano	<i>Trachinotus carolinus</i>
Permit	<i>Trachinotus falcatus</i>
Rough scad	<i>Trachurus lathamii</i>
Atlantic cutlassfish	<i>Trichiurus lepturus</i>
Hogchoker	<i>Trinectes maculatus</i>
Southern hake	<i>Urophycis floridana</i>
Class Amphibia (frogs and salamanders)	
Florida cricket frog	<i>Acris gryllus dorsalis</i>
Mole salamander	<i>Ambystoma talpoideum</i>
Oak toad	<i>Bufo quercicus</i>
Southern Toad	<i>Bufo terrestris</i>
Greenhouse frog	<i>Eleutherodactylus planirostris</i>
Dwarf salamander	<i>Eurycea quadradigitata</i>
Narrow-mouthed toad	<i>Gastrophryne carolinensis</i>
Green tree frog	<i>Hyla cinerea</i>
Pine woods tree frog	<i>Hyla femoralis</i>
Barking treefrog	<i>Hyla gratiosa</i>
Squirrel tree frog	<i>Hyla squirella</i>
Striped newt	<i>Notophthalmus perstriatus</i>
Cuban tree frog	<i>Osteopilus septentrionalis</i>
Spring peeper	<i>Pseudacris crucifer</i>
Florida chorus frog	<i>Pseudacris nigrita verrucosa</i>
Little grass frog	<i>Pseudacris ocularis</i>
Gopher Frog	<i>Rana capito</i>
Bullfrog	<i>Rana catesbeiana</i>
Pig frog	<i>Rana grylio</i>
Florida leopard frog	<i>Rana sphenoccephala</i>
Eastern spadefoot	<i>Scaphiopus holbrookii</i>
Class Reptilia (reptiles)	
Florida cottonmouth	<i>Agkistrodon piscivorus conanti</i>
American alligator	<i>Alligator mississippiensis</i>
Green anole	<i>Anolis carolinensis</i>
Brown anole	<i>Anolis sagrei</i>
Florida softshell turtle	<i>Apalone ferox</i>
Six-lined racerunner	<i>Aspidoscelis sexlineatus</i>
Loggerhead sea turtle	<i>Caretta caretta</i>
Florida scarlet snake	<i>Cemophora coccinea</i>
Green sea turtle	<i>Chelonia mydas</i>
Florida snapping turtle	<i>Chelydra serpentina osceola</i>
Florida cooter	<i>Chrysemys floridana</i>
Spotted turtle	<i>Clemmys guttata</i>
Black racer	<i>Coluber constrictor priapus</i>
Eastern diamondback rattlesnake	<i>Crotalus adamanteus</i>
Chicken turtle	<i>Deirochelys reticularia</i>
Leatherback sea turtle	<i>Dermochelys coriacea</i>
Southern ringneck snake	<i>Diadophis punctatus punctatus</i>

Common Name	Genus/Species
Eastern indigo snake	<i>Drymarchon corais couperi</i>
Red rat snake	<i>Elaphe guttata</i>
Southeastern five-lined skink	<i>Eumeces inexpectatus</i>
Broad-headed skink	<i>Eumeces laticeps</i>
Eastern mud snake	<i>Farancia abacura abacura</i>
Gopher tortoise	<i>Gopherus polyphemus</i>
Florida red bellied turtle	<i>Grysemys nelsoni</i>
Mediterranean gecko	<i>Hemidactylus garnotii</i>
Striped mud turtle	<i>Kinosternon bauri</i>
Florida mud turtle	<i>Kinosternon subrubrum steindachneri</i>
Eastern mud turtle	<i>Kinosternon subrubrum subrubrum</i>
Eastern king snake	<i>Lampropeltis getula getula</i>
Scarlet king snake	<i>Lampropeltis triangulum elapsoides</i>
Kemp's Ridley sea turtle	<i>Lepidochelys kempii</i>
Diamondback terrapin	<i>Malaclemys terrapin centrata</i>
Eastern coachwhip	<i>Masticophis flagellum flagellum</i>
Coral snake	<i>Micrurus fulvius</i>
Florida water snake	<i>Nerodia fasciata pictiventris</i>
Rough green snake	<i>Opheodrys aestivus</i>
Eastern glass lizard	<i>Ophisaurus ventralis</i>
Corn snake	<i>Pantherophis guttata guttata</i>
Yellow rat snake	<i>Pantherophis obsoleta quadrivittata</i>
Florida redbelly turtle	<i>Pseudemys nelsoni</i>
Peninsula cooter	<i>Pseudemys peninsularis</i>
Pine woods snake	<i>Rhadinaea flavilata</i>
Ground skink	<i>Scincella lateralis</i>
Greater siren	<i>Siren lacertina</i>
Dusky pigmy rattlesnake	<i>Sistrurus miliarius barbouri</i>
Florida box turtle	<i>Terrapene carolina bauri</i>
Peninsula ribbon snake	<i>Thamnophis sauritus nitae</i>
Eastern garter snake	<i>Thamnophis sirtalis</i>
Yellow-bellied slider	<i>Trachemys scripta</i>
Class Aves (birds)	
Cooper's hawk	<i>Accipiter cooperii</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Spotted sandpiper	<i>Actitis macularia</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Wood duck	<i>Aix sponsa</i>
Roseate spoonbill	<i>Ajaia ajaja</i>
Saltmarsh sharp-tailed sparrow	<i>Ammodramus caudacutus</i>
Seaside sparrow	<i>Ammodramus maritimus</i>
Nelson's sharp-tailed sparrow	<i>Ammodramus nelsoni</i>
Grasshopper sparrow	<i>Ammodramus savannarum</i>
Northern pintail	<i>Anas acuta</i>
American widgeon	<i>Anas americana</i>
Northern shoveler	<i>Anas clypeata</i>
Green-winged teal	<i>Anas crecca</i>
Blue-winged teal	<i>Anas discors</i>
Mottled duck	<i>Anas fulvigula</i>
Mallard	<i>Anas platyrhynchos</i>
American black duck	<i>Anas ruprides</i>
Gadwall	<i>Anas strepera</i>
Anhinga	<i>Anhinga anhinga</i>
American pipit	<i>Anthus rubescens</i>
Water pipit	<i>Anthus spinoletta</i>
Florida scrub jay	<i>Aphelocoma coerulescens</i>
Fox sparrow	<i>Apsserella iliaca</i>
Limpkin	<i>Aramus guarauna</i>
Ruby-throated hummingbird	<i>Archilochus colubris</i>

Common Name	Genus/Species
Great egret	<i>Ardea alba</i>
Great blue heron	<i>Ardea herodias</i>
Ruddy turnstone	<i>Arenaria interpres</i>
Lesser scaup	<i>Aythya affinis</i>
Redhead	<i>Aythya americana</i>
Ring-necked duck	<i>Aythya collaris</i>
Greater scaup	<i>Aythya marila</i>
Canvasback	<i>Aythya valisineria</i>
Tufted titmouse	<i>Baeolophus bicolor</i>
Cedar waxwing	<i>Bombycilla cedrorum</i>
American bittern	<i>Botaurus lentiginosus</i>
Brant	<i>Branta bernicla</i>
Great horned owl	<i>Bubo virginianus</i>
Cattle egret	<i>Bubulcus ibis</i>
Bufflehead	<i>Bucephala albeola</i>
Common goldeneye	<i>Bucephala clangula</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Green heron	<i>Butorides virescens</i>
Sanderling	<i>Calidris alba</i>
Dunlin	<i>Calidris alpina</i>
Red knot	<i>Calidris canutus</i>
Western sandpiper	<i>Calidris mauri</i>
Least sandpiper	<i>Calidris minutilla</i>
Semipalmated sandpiper	<i>Calidris pusilla</i>
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>
Whip-poor-will	<i>Caprimulgus vociferus</i>
Northern cardinal	<i>Cardinalis cardinalis</i>
American goldfinch	<i>Carduelis tristis</i>
Purple finch	<i>Carpodacus purpureus</i>
Turkey vulture	<i>Cathartes aura</i>
Veery	<i>Catharus fuscescens</i>
Hermit thrush	<i>Catharus guttatus</i>
Gray-cheeked thrush	<i>Catharus minimus</i>
Swainson's thrush	<i>Catharus ustulatus</i>
Willet	<i>Catoptrophorus semipalmatus</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Chimney swift	<i>Chaetura pelagica</i>
Piping plover	<i>Charadrius melodus</i>
Semipalmated plover	<i>Charadrius semipalmatus</i>
Killdeer	<i>Charadrius vociferus</i>
Wilson's plover	<i>Charadrius wilsonia</i>
Snow goose	<i>Chen caerulescens</i>
Black tern	<i>Chlidonias niger</i>
Lark sparrow	<i>Chondestes grammacus</i>
Common nighthawk	<i>Chordeiles minor</i>
Northern harrier	<i>Circus cyaneus</i>
Marsh wren	<i>Cistothorus palustris</i>
Sedge wren	<i>Cistothorus platensis</i>
Yellow-billed cuckoo	<i>Coccyzus americanus</i>
Northern flicker	<i>Colaptes auratus</i>
Northern bobwhite	<i>Colinus virginianus</i>
Rock pigeon	<i>Columbia livia</i>
Common ground-dove	<i>Columbina passerina</i>
Eastern wood-pewee	<i>Contopus virens</i>
Black vulture	<i>Coragyps altratus</i>
American crow	<i>Corvus brachyrhynchos</i>
Fish crow	<i>Corvus ossifragus</i>
Blue jay	<i>Cyanocitta cristata</i>

Common Name	Genus/Species
Tundra swan	<i>Cygnus columbianus</i>
Black-bellied whistling duck	<i>Dendrocygna autumnalis</i>
Fulvous whistling-duck	<i>Dendrocygna bicolor</i>
Black-throated blue warbler	<i>Dendroica caerulescens</i>
Bay-breasted warbler	<i>Dendroica castanea</i>
Cerulean warbler	<i>Dendroica cerulea</i>
Yellow-rumped warbler	<i>Dendroica coronata</i>
Prairie warbler	<i>Dendroica discolor</i>
Yellow-throated warbler	<i>Dendroica dominica</i>
Blackburnian warbler	<i>Dendroica fusca</i>
Kirtland's warbler	<i>Dendroica kirtlandii</i>
Magnolia warbler	<i>Dendroica magnolia</i>
Palm warbler	<i>Dendroica palmarum</i>
Chestnut-sided warbler	<i>Dendroica pensylvanica</i>
Yellow warbler	<i>Dendroica petechia</i>
Pine warbler	<i>Dendroica pinus</i>
Blackpoll warbler	<i>Dendroica striata</i>
Cape May warbler	<i>Dendroica tigrina</i>
Black-throated green warbler	<i>Dendroica virens</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Pileated woodpecker	<i>Dryocopus pileatus</i>
Gray catbird	<i>Dumetella carolinensis</i>
Little blue heron	<i>Egretta caerulea</i>
Reddish egret	<i>Egretta rufescens</i>
Snowy egret	<i>Egretta thula</i>
Tricolored heron	<i>Egretta tricolor</i>
Swallow-tailed kite	<i>Elanoides forficatus</i>
White ibis	<i>Eudocimus albus</i>
Merlin	<i>Falco columbarius</i>
Peregrine falcon	<i>Falco peregrinus</i>
American kestrel	<i>Falco sparverius</i>
Magnificent frigate bird	<i>Fregata magnificens</i>
American coot	<i>Fulica americana</i>
Common snipe	<i>Gallinago gallinago</i>
Common moorhen	<i>Gallinula chloropus</i>
Common loon	<i>Gavia immer</i>
Red-throated loon	<i>Gavia stellata</i>
Common yellowthroat	<i>Geothlypis trichas</i>
Florida sandhill crane	<i>Grus canadensis pratensis</i>
Blue grosbeak	<i>Guiraca caerulea</i>
American oystercatcher	<i>Haematopus palliatus</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Worm-eating warbler	<i>Helmitheros vermivora</i>
Black-necked stilt	<i>Himantopus mexicanus</i>
Barn swallow	<i>Hirundo rustica</i>
Wood thrush	<i>Hylocichla mustelina</i>
Baltimore oriole	<i>Icterus galbula</i>
Orchard oriole	<i>Icterus spurius</i>
Least bittern	<i>Ixobrychus exilis</i>
Dark-eyed junco	<i>Junco hyemalis</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Herring gull	<i>Larus argentatus</i>
Laughing gull	<i>Larus atricilla</i>
Ring-billed gull	<i>Larus delawarensis</i>
Lesser black backed gull	<i>Larus fuscus</i>
Great black-backed gull	<i>Larus marinus</i>
Bonaparte's gull	<i>Larus philadelphia</i>
Short-billed dowitcher	<i>Limnodromus griseus</i>
Long-billed dowitcher	<i>Limnodromus scolopaceus</i>

Common Name	Genus/Species
Marbled godwit	<i>Limosa fedoa</i>
Hooded merganser	<i>Lophodytes cucullatus</i>
Wild turkey	<i>Melagris gallopavo</i>
Red-bellied woodpecker	<i>Melanerpes carolinus</i>
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>
White-winged scoter	<i>Melanitta fusca</i>
Black scoter	<i>Melanitta nigra</i>
Surf scoter	<i>Melanitta perspicillata</i>
Swamp sparrow	<i>Melospiza georgiana</i>
Song sparrow	<i>Melospiza melodia</i>
Red-breasted merganser	<i>Mergus serrator</i>
Northern mockingbird	<i>Mimus polyglottos</i>
Black-and-white warbler	<i>Mniotilta varia</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Northern gannet	<i>Morus bassanus</i>
Wood stork	<i>Mycteria americana</i>
Great crested flycatcher	<i>Myiarchus crinitus</i>
Whimbrel	<i>Numenius phaeopus</i>
Yellow-crowned night-heron	<i>Nyctanassa violacea</i>
Black-crowned night-heron	<i>Nycticorax nycticorax</i>
Yellow crowned night heron	<i>Nycticorax violaceus</i>
Wilson's storm-petrel	<i>Oceanites oceanicus</i>
Eastern screech-owl	<i>Otus asio</i>
Ruddy duck	<i>Oxyura jamaicensis</i>
Osprey	<i>Pandion haliaetus</i>
Northern parula	<i>Parula americana</i>
House sparrow	<i>Passer domesticus</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Painted bunting	<i>Passerina ciris</i>
Indigo bunting	<i>Passerina cyanea</i>
American white pelican	<i>Pelecanus erythrorhynchos</i>
Brown pelican	<i>Pelecanus occidentalis</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>
Red-cockaded woodpecker	<i>Picoides borealis</i>
Downy woodpecker	<i>Picoides pubescens</i>
Hairy woodpecker	<i>Picoides villosus</i>
Eastern towhee	<i>Pipilo erythrophthalmus</i>
Scarlet tanager	<i>Piranga olivacea</i>
Summer tanager	<i>Piranga rubra</i>
Snow bunting	<i>Plectrophenax nivalis</i>
Glossy ibis	<i>Plegadis falcinellus</i>
Black-bellied plover	<i>Pluvialis squatarola</i>
Horned grebe	<i>Podiceps auritus</i>
Red-necked grebe	<i>Podiceps grisegena</i>
Pied-billed grebe	<i>Podilymbus podiceps</i>
Carolina chickadee	<i>Poecile carolinensis</i>
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>
Vesper sparrow	<i>Poocetes gramineus</i>
Purple gallinule	<i>Porphyryla martinica</i>
Sora	<i>Porzana carolina</i>
Purple martin	<i>Progne subis</i>
Prothonotary warbler	<i>Protonotaria citrea</i>
Boat-tailed grackle	<i>Quiscalus major</i>
Common grackle	<i>Quiscalus quiscula</i>
King rail	<i>Rallus elegans</i>
Virginia rail	<i>Rallus limicola</i>
Clapper rail	<i>Rallus longirostris</i>
American avocet	<i>Recurvirostra americana</i>

Common Name	Genus/Species
Ruby-crowned kinglet	<i>Regulus calendula</i>
Golden-crowned kinglet	<i>Regulus satrapa</i>
Black skimmer	<i>Rynchops niger</i>
Eastern phoebe	<i>Sayornis phoebe</i>
American woodcock	<i>Scolopax minor</i>
Ovenbird	<i>Seiurus aurocapillus</i>
Louisiana waterthrush	<i>Seiurus motacilla</i>
Northern waterthrush	<i>Seiurus noveboracensis</i>
American redstart	<i>Setophaga ruticilla</i>
Eastern bluebird	<i>Sialia sialis</i>
Red breasted nuthatch	<i>Sitta canadensis</i>
Brown-headed nuthatch	<i>Sitta pusilla</i>
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>
Chipping sparrow	<i>Spizella passerina</i>
Field sparrow	<i>Spizella pusilla</i>
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>
Least tern	<i>Sterna antillarum</i>
Caspian tern	<i>Sterna caspia</i>
Roseate tern	<i>Sterna dougallii</i>
Forster's tern	<i>Sterna forsteri</i>
Common tern	<i>Sterna hirundo</i>
Royal tern	<i>Sterna maxima</i>
Gull-billed tern	<i>Sterna nilotica</i>
Sandwich tern	<i>Sterna sandvicensis</i>
Eurasian collared-dove	<i>Streptopelia decaocto</i>
Barred owl	<i>Strix varia</i>
Eastern meadowlark	<i>Sturnella magna</i>
European starling	<i>Sturnus vulgaris</i>
Northern rough winged swallow	<i>Telgidopteryx serripennis</i>
Carolina wren	<i>Thryothorus ludovicianus</i>
Brown thrasher	<i>Toxostoma rufum</i>
Tree swallow	<i>Trachycineta bicolor</i>
Lesser yellowlegs	<i>Tringa flavipes</i>
Greater yellowlegs	<i>Tringa melanoleuca</i>
Solitary sandpiper	<i>Tringa solitaria</i>
House wren	<i>Troglodytes aedon</i>
American robin	<i>Turdus migratorius</i>
Gray kingbird	<i>Tyrannus dominicensis</i>
Eastern kingbird	<i>Tyrannus tyrannus</i>
Western kingbird	<i>Tyrannus verticalis</i>
Barn owl	<i>Tyto alba</i>
Orange-crowned warbler	<i>Vermivora celata</i>
Golden-winged warbler	<i>Vermivora chrysoptera</i>
Tennessee warbler	<i>Vermivora peregrina</i>
Blue-winged warbler	<i>Vermivora pinus</i>
Nashville warbler	<i>Vermivora ruficapilla</i>
Yellow-throated vireo	<i>Vireo flavifrons</i>
White-eyed vireo	<i>Vireo griseus</i>
Red-eyed vireo	<i>Vireo olivaceus</i>
Blue-headed vireo	<i>Vireo solitarius</i>
Hooded warbler	<i>Wilsonia citrina</i>
Wilson's warbler	<i>Wilsonia pusilla</i>
Mourning dove	<i>Zenaida macroura</i>
White-throated sparrow	<i>Zonotrichia albicollis</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Class Mammalia (mammals)	
Right whale	<i>Balaena glacialis</i>
Short tail shrew	<i>Blarina brevicauda</i>
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>

Common Name	Genus/Species
Nine-banded armadillo	<i>Dasypus novemcinctus</i>
Virginia opossum	<i>Didelphis virginiana</i>
Atlantic right whale	<i>Eubalaena glacialis</i>
Southeastern pocket gopher	<i>Geomys pinetis</i>
Southern flying squirrel	<i>Glaucomys volans</i>
Pygmy sperm whale	<i>Kogia breviceps</i>
Eastern red bat	<i>Lasiurus borealis</i>
River otter	<i>Lontra canadensis</i>
Bobcat	<i>Lynx rufus</i>
Humpback whale	<i>Megaptera novaeangliae</i>
Striped skunk	<i>Mephitis mephitis</i>
House mouse	<i>Mus musculus</i>
Florida mink	<i>Mustela vison lutensis</i>
Florida Mink	<i>Mustela vison mink</i>
Southeastern myotis	<i>Myotis austroriparius</i>
Round tailed muskrat	<i>Neofiber alleni</i>
Eastern woodrat	<i>Neotoma floridana</i>
Seminole bat	<i>Nycteris seminolis</i>
Golden mouse	<i>Ochrotomys nuttalli</i>
White-tailed deer	<i>Odocoileus virginianus</i>
Marsh rice rat	<i>Oryzomys palustris</i>
Cotton mouse	<i>Peromyscus gossypinus gossypinus</i>
Anastasia Island beach mouse	<i>Peromyscus polionotus phasma</i>
Old field mouse	<i>Peromyscus polionotus polionotus</i>
Florida mouse	<i>Peromyscus floridanus</i>
Raccoon	<i>Procyon lotor</i>
Norway rat	<i>Rattus norvegicus</i>
Black rat	<i>Rattus rattus</i>
Eastern harvest mouse	<i>Reithrodontomys humulis</i>
Eastern mole	<i>Scalopus aquaticus</i>
Gray squirrel	<i>Sciurus carolinensis</i>
Hispid cotton rat	<i>Sigmodon hispidus</i>
Southeastern shrew	<i>Sorex longirostris</i>
Eastern spotted skunk	<i>Spilogale putorius</i>
Feral pig	<i>Sus scrofa</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Marsh rabbit	<i>Sylvilagus palustris</i>
West Indian manatee	<i>Trichechus manatus</i>
Bottle-nosed dolphin	<i>Tursiops truncatus</i>
Gray fox	<i>Urocyon cinereoargenteus</i>
Florida black bear	<i>Ursus americanus floridanus</i>
Red fox	<i>Vulpes vulpes</i>

A.6 / Designated and Listed Species (rank and status)

The Status of these species are in accordance with the information provide by FNAI (<http://www.fnai.org/ranks.cfm>)

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Location
CAMA / Likely found in the CAMA Managed area (uplands or submerged lands); GTM / Likely t found within the GTM Research Reserve outside the CAMA managed area.						
Fish						
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	G3	S1	LE	LE	CAMA
Atlantic sturgeon	<i>Acipenser oxyrinchus oxyrinchus</i>	G3T3	S1	C	LS	CAMA
Mountain mullet	<i>Agonostomus monticola</i>	G5	S3	N	N	CAMA
Opossum pipefish	<i>Microphis brachyurus</i>	G4G5	S2	SC	N	CAMA
Sea pamprey	<i>Petromyzon marinus</i>	G5	SNA	N	N	CAMA

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Location
CAMA / Likely found in the CAMA Managed area (uplands or submerged lands); GTM / Likely found within the GTM Research Reserve outside the CAMA managed area.						
Amphibians						
Striped newt	<i>Notophthalmus perstriatus</i>	G2G3	S2S3	N	N	GTM
Gopher frog	<i>Rana capito</i>	G3	S3	N	LS	GTM
Reptiles						
American alligator	<i>Alligator mississippiensis</i>	G5	S4	SAT	LS	CAMA
Loggerhead	<i>Caretta caretta</i>	G3	S3	LT	LT	CAMA
Green turtle	<i>Chelonia mydas</i>	G3	S2	LE	LE	CAMA
Eastern diamondback rattlesnake	<i>Crotalus adamanteus</i>	G4	S3	N	N	CAMA
Leatherback	<i>Dermochelys coriacea</i>	G2	S2	LE	LE	CAMA
Eastern indigo snake	<i>Drymarchon couperi</i>	G3	S3	LT	LT	CAMA
Gopher tortoise	<i>Gopherus polyphemus</i>	G3	S3	N	LT	CAMA
Common kingsnake	<i>Lampropeltis getula</i>	G5	S2S3	N	N	CAMA
Kemp's Ridley	<i>Lepidochelys kempii</i>	G1	S1	LE	LE	CAMA
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	G4T3	S3	N	LS	CAMA
Birds						
Bachman's sparrow	<i>Aimophila aestivalis</i>	G3	S3	N	N	GTM
Great egret	<i>Ardea alba</i>	G5	S4	N	N	CAMA
Piping plover	<i>Charadrius melodus</i>	G3	S2	LT	LT	CAMA
Little blue heron	<i>Egretta caerulea</i>	G5	S4	N	LS	CAMA
Snowy egret	<i>Egretta thula</i>	G5	S3	N	LS	CAMA
Tricolored heron	<i>Egretta tricolor</i>	G5	S4	N	LS	CAMA
Swallow-tailed kite	<i>Elanoides forficatus</i>	G5	S2	N	N	CAMA
White ibis	<i>Eudocimus albus</i>	G5	S4	N	LS	CAMA
Merlin	<i>Falco columbarius</i>	G5	S2	N	N	CAMA
Peregrine falcon	<i>Falco peregrinus</i>	G4	S2	N	LE	CAMA
Southeastern American kestrel	<i>Falco sparverius paulus</i>	G5T4	S3	N	LT	CAMA
American oystercatcher	<i>Haematopus palliatus</i>	G5	S2	N	LS	CAMA
Bald eagle	<i>Haliaeetus leucocephalus</i>	G5	S3	N	LT	CAMA
Least bittern	<i>Ixobrychus exilis</i>	G5	S4	N	N	CAMA
Wood stork	<i>Mycteria americana</i>	G4	S2	LE	LE	CAMA
Yellow-crowned night-heron	<i>Nyctanassa violacea</i>	G5	S3	N	N	CAMA
Black-crowned night-heron	<i>Nycticorax nycticorax</i>	G5	S3	N	N	CAMA
Osprey	<i>Pandion haliaetus</i>	G5	S3S4	N	LS*	CAMA
Painted bunting	<i>Passerina ciris</i>	G5	S3	N	N	CAMA
Brown pelican	<i>Pelecanus occidentalis</i>	G4	S3	N	LS	CAMA
Hairy woodpecker	<i>Picoides villosus</i>	G5	S3	N	N	CAMA
Roseate spoonbill	<i>Platalea ajaja</i>	G5	S2	N	LS	CAMA
Glossy ibis	<i>Plegadis falcinellus</i>	G5	S3	N	N	CAMA
Black skimmer	<i>Rynchops niger</i>	G5	S3	N	LS	CAMA
Least tern	<i>Sterna antillarum</i>	G4	S3	N	LT	CAMA
Caspian tern	<i>Sterna caspia</i>	G5	S2	N	N	CAMA
Royal tern	<i>Sterna maxima</i>	G5	S3	N	N	CAMA
Sandwich tern	<i>Sterna sandvicensis</i>	G5	S2	N	N	CAMA
Mammals						
Right whale	<i>Eubalaena glacialis</i>	G1	S1	LE	LE	CAMA
Southeastern weasel	<i>Mustela frenata olivacea</i>	G5T4	S3?	N	N	CAMA
Atlantic salt marsh mink	<i>Neovison vison lutensis</i>	G5T3	S3	N	N	CAMA
Anastasia beach mouse	<i>Peromyscus polionotus phasma</i>	G5T1	S1	LE	LE	CAMA
Florida mouse	<i>Peromyscus floridanus</i>	G3	S3	N	LS	CAMA
Sherman's fox squirrel	<i>Sciurus niger shermani</i>	G5T3	S3	N	LS	CAMA
Manatee	<i>Trichechus manatus</i>	G2	S2	LE	LE	CAMA

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Location
CAMA / Likely found in the CAMA Managed area (uplands or submerged lands); GTM / Likely t found within the GTM Research Reserve outside the CAMA managed area.						
Florida black bear	<i>Ursus americanus floridanus</i>	G5T2	S2	N	LT*	CAMA
Bivalves (Clams and Mussels)						
Atlantic geoduck	<i>Panopea bitruncata</i>	G3?	S3?	N	N	GTM
Gastropods (Snails and Allies)						
Squemouth amnicola snail	<i>Amnicola rhombostoma</i>	GH	SH	N	N	CAMA
Creek siltsnail	<i>Floridobia fraterna</i>	G2	S2	N	N	CAMA
Dragonflies and Damselflies						
Taper-tailed darner	<i>Gomphaeschna antilope</i>	G4	S4	N	N	CAMA
Beetles						
Small pocket gopher aphodius beetle	<i>Aphodius aegrotus</i>	GNR	S3?	N	N	GTM
Surprising pocket gopher aphodius beetle	<i>Aphodius dyspistus</i>	GNR	S3?	N	N	GTM
Large pocket gopher aphodius beetle	<i>Aphodius laevigatus</i>	G3?	S3?	N	N	GTM
Bicolored burrowing scarab beetle	<i>Bolbocerosoma hamatum</i>	GNR	S3S4	N	N	GTM
Schwarz' pocket gopher ptomaphagus beetle	<i>Ptomaphagus schwarzi</i>	GNR	S3	N	N	GTM
Butterflies and Moths						
Lace-winged roadside skipper	<i>Amblyscirtes aesculapius</i>	G4	S3	N	N	GTM
Plants and Lichens						
Southern milkweed	<i>Asclepias viridula</i>	G2	S2	N	LT	GTM
Canby's wild indigo	<i>Baptisia calycosa</i> var. <i>calycosa</i>	G3T1	S1	N	N	GTM
Bartram's ixia	<i>Calydorea coelestina</i>	G2	S2	N	LE	GTM
Chapman's sedge	<i>Carex chapmanii</i>	G3	S3	N	LE	GTM
Sand-dune spurge	<i>Chamaesyce cumulicola</i>	G2	S2	N	LE	GTM
Ciliate-leaf tickseed	<i>Coreopsis integrifolia</i>	G1G2	S1	N	LE	GTM
Florida toothache-grass	<i>Ctenium floridanum</i>	G2	S2	N	LE	GTM
Coastal vervain	<i>Glandularia maritima</i>	G3	S3	N	LE	GTM
Lake-side sunflower	<i>Helianthus carnosus</i>	G1G2	S1S2	N	LE	GTM
Pondspice	<i>Litsea aestivalis</i>	G3	S2	N	LE	GTM
Curtis's loosestrife	<i>Lythrum curtissii</i>	G1	S1	N	LE	GTM
Pygmy pipes	<i>Monotropsis reynoldsiae</i>	G1Q	S1	N	LE	CAMA
Celestial lily	<i>Nemastylis floridana</i>	G2	S2	N	LE	GTM
Florida beargrass	<i>Nolina atopocarpa</i>	G3	S3	N	LT	GTM
Florida mountain-mint	<i>Pycnanthemum floridanum</i>	G3	S3	N	LT	GTM
Pineland beaksedge	<i>Rhynchospora punctata</i>	G1?	SH	N	N	GTM
Thorne's beaksedge	<i>Rhynchospora thornei</i>	G3	S1S2	N	N	GTM
St. John's back-eyed-susan	<i>Rudbeckia nitida</i>	G3	S2	N	LE	GTM

FNAI Global Rank Definitions

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.

G4 = Apparently secure globally (may be rare in parts of range).

G5 = Demonstrably secure globally.
GH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker).
GX = Believed to be extinct throughout range.
GXC = Extirpated from the wild but still known from captivity or cultivation.
G#? = Tentative rank (e.g., G2?).
G#G# = Range of rank; insufficient data to assign specific global rank (e.g., G2G3).
G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1).
G#Q = Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q).
G#T#Q = Same as above, but validity as subspecies or variety is questioned.
GU = Unrankable; due to a lack of information no rank or range can be assigned (e.g., GUT2).
GNA = Ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).
GNR = Element not yet ranked (temporary).
GNRTNR = Neither the element nor the taxonomic subgroup has yet been ranked.

FNAI State Rank Definitions

S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
S3 = Either very rare and local in Florida (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
S4 = Apparently secure in Florida (may be rare in parts of range).
S5 = Demonstrably secure in Florida.
SH = Of historical occurrence in Florida, possibly extirpated, but may be rediscovered (e.g., ivory-billed woodpecker).
SX = Believed to be extirpated throughout Florida.
SU = Unrankable; due to a lack of information no rank or range can be assigned.
SNA = State ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).
SNR = Element not yet ranked (temporary).

Federal Legal Status

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.

LE = Endangered: species in danger of extinction throughout all or a significant portion of its range.
LT = Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.
LT,PDL = Species currently listed threatened but has been proposed for delisting.
SAT = Treated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.
PE = Proposed for listing as Endangered species.
PT = Proposed for listing as Threatened species.
C = Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
XN = Non-essential experimental population.
SC = Not currently listed, but considered a species of concern to USFWS.
N = Not currently listed, nor currently being considered for listing as Endangered or Threatened.

State Status

Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.

LE = Endangered: species, subspecies, or isolated population so few or depleted in number or so restricted in range that it is in imminent danger of extinction.
LT = Threatened: species, subspecies, or isolated population facing a very high risk of extinction in the future.
LS = Species of Special Concern is a species, subspecies, or isolated population which is facing a moderate risk of extinction in the future.
PE = Proposed for listing as Endangered.
PT = Proposed for listing as Threatened.
PS = Proposed for listing as Species of Special Concern.
N = Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or see: <http://www.doacs.state.fl.us/pi/>.

- LE** = Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.
- LT** = Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.
- PE** = Proposed for listing as Endangered.
- PT** = Proposed for listing as Threatened.
- N** = Not currently listed, nor currently being considered for listing.

A.7 / Nuisance and Invasive Species Control Plan

Introduction: Invasive species are those plants or animals that are not native to Florida, but were introduced because of human-related activities. These exotics have fewer natural enemies and may have a higher survival rate than do native species, as well. They may also harbor diseases or parasites that significantly affect non-resistant native species and people. Consequently, it is the strategy of CAMA to control exotic and nuisance species within native natural communities (Tables 3, 4, & 5).

Definitions

Native: A species already occurring in Florida at the time of initial European contact (1500).

Non-native: A species not found in Florida at the time of initial European contact.

Domestic: Tame species maintained as pets or livestock.

Invasive: A species non-native to Florida that has established a reproducing population here either through a natural or a human introduction. Such species aggressively compete with native species and have an adverse effect on biodiversity.

Feral: An individual or a population of a species formally kept as domestic that has escaped or been released into the wild and now sustains a reproducing population.

Problem/nuisance species: Native species that cause specific management problems or concerns due to their impact on listed species or human health.

Table 6 / Invasive Non-native species list.

Common Name	Scientific name
Brazilian pepper	<i>Schinus terebinthifolius</i>
Chinese tallow-tree	<i>Sapium sebiferum</i>
Air potato	<i>Dioscorea bulbifera</i>
Giant reed	<i>Arundo donax</i>
Elephant ear	<i>Xanthosoma sagittifolium</i>
Camphortree	<i>Cinnamomum camphora</i>
Mimosa	<i>Albizia julibrissin</i>
Bladderpod	<i>Sesbania vesicaria</i>
Mosquitoes	(see Table 5)
Sicklepod	<i>Cassia obtusifolia</i>
Shrub verbena	<i>Lantana camara</i>
Cogongrass	<i>Imperata cylindrica</i>
Japanese privet	<i>Ligustrum japonicum</i>
European starling	<i>Sturnus vulgaris</i>
Brown-headed cowbird	<i>Molothrus ater</i>
House sparrows	<i>Passer domesticus</i>
Eurasian collared-doves	<i>Streptopelia decaocto</i>
House mice	<i>Mus musculus</i>
Black rats	<i>Rattus rattus</i>
Feral hogs	<i>Sus scrofa</i>
Feral cats	<i>Felis catus</i>
Nine-banded armadillos	<i>Dasypus novemcinctus</i>
Fire ants	<i>Solenopsis invicta</i>
Acorn barnacles	<i>Megabalanus coccoporna</i>
Asian green mussel	<i>Perna viridis</i>

Feral hogs (*Sus scrofa*) occur at the GRMAP, with feral hogs being the most damaging exotic species. The rooting of ground flora in wetlands and low hammock areas and disturbance of midden sites is notable at times. The protective fence around the aboriginal burial mound (Sanchez Mound) should be maintained to conserve this important archaeological site. A long “hog resistant” fence has been erected along the northern boundary of the peninsular portion of the site to restrict immigration of feral hogs from the GRWMA. Two one-way hog gates in this fence allow hogs to move from the site to the GRWMA. These hog gates will be baited on a regular basis to encourage hogs to move out of the preserve. Hogs are removed from the coastal strand along SR A1A whenever necessary. In addition, hogs will be aggressively trapped on the peninsula and removed on a consistent basis throughout the year.

Other exotic animals known to be on or adjacent to the preserve include fire ants (*Solenopsis invicta*), house sparrows (*Passer domesticus*), European starlings (*Sturnus vulgaris*), Eurasian collared-doves (*Streptopelia decaocto*), house mice (*Mus musculus*), and black rats (*Rattus rattus*). None of these species appear to be abundant. Reserve staff round up any stray dogs encountered on routine patrols. Stray cats are live trapped. All domestic pets are taken to the St. Johns County humane shelter.

In recent years coyotes have gradually been expanding their range into Florida. Surveys for this species have been performed in cooperation with a research group from the University of Florida. The only sighting of this species in the preserve was observed in 2002 (Florida Division of Forestry (FDOF) Biologist Robin Boughton, personal observation) and possibly responsible for the heavy sea turtle nest predation in 2006 by a medium sized canine. These surveys of occurrence will continue for this species in order to provide for any future management decisions.

The only exotic plants requiring persistent management action are sicklepod (*Cassia obtusifolia*), Japanese privet (*Ligustrum japonicum*), and shrub verbena (*Lantana camara*). These are now well under control, requiring only occasional inspection of wetlands and disturbed sites for new volunteer plants. Signs of all exotics are routinely monitored so that any dramatic increase in existing populations or arrivals of new species can be dealt with swiftly.

GTM Research Reserve is located in a state that has experienced significant invasions of exotic flora and fauna since World War II. Invasive exotic plants and animals create significant ecological degradation in Florida through direct and indirect competition with native flora and fauna. Invasive and nuisance species control costs private and public land managers millions of dollars annually in Florida. The Stewardship Staff of GTM Research Reserve will work cooperatively with other state, federal, and local partners to identify and control populations of invasive and nuisance exotic plant and animal species within and adjacent to the boundaries of the reserve.

Table 7 | Native nuisance/problem species.

Common Name	Scientific name
Raccoons	<i>Procyon lotor</i>
Mosquitoes	<i>Aedes sp., Culex sp.</i>
Alligator	<i>Alligator mississippiensis</i>

Invasive and Nuisance Animal Species of Highest Concern

- Feral Hogs, (*Sus scrofa*)
- Feral Cats, (*Felis catus*)
- Nine-banded Armadillo, (*Dasypus novemcinctus*)
- Asian green mussels, (*Perna viridis*)
- Golden (channeled) apple snail, (*Pomacea canaliculata*)
- Cuban brown anole, (*Anolis sagrei*)
- Cuban tree frog, (*Osteopilus septentrionalis*)
- Fire Ants, (*Solenopsis invicta*)
- Non-native and invasive mosquitoes (Table 5)

Table 8 | Established invasive and non-native mosquitoes and important natural history traits (Juliano and Lounibos (2005)).

Species (origin)	Macrohabitat preference	Larval habitats	Desiccation-resistant eggs	References
<i>Aedes aegypti</i> (Africa)	Urban, domestic [†]	Man-made containers	Yes	Christophers (1960)
<i>Aedes albopictus</i> (temperate and tropical Asia)	Urban, suburban	Phytotelmata*, man-made containers	Yes	Hawley (1988)
<i>Ochlerotatus atropalpus</i> (E. N. America)	Riparian	Rock pools, man-made containers	Yes	Lounibos (2002)
<i>Ochlerotatus japonicus</i> (temperate Asia)	Rural, sylvan	Rock pools, man-made containers	Yes	Lounibos (2002)
<i>Culex pipiens</i> (Old World)	Urban, domestic, suburban	Man-made containers, subterranean, small groundwater pools	No	Vinogradova (2000)
<i>Culex quinquefasciatus</i> (Africa)	Urban, domestic, suburban	Man-made containers, small groundwater pools	No	Vinogradova (2000)

* Phytotelmata are parts of terrestrial plants that hold water and are occupied by a community of resident animals; includes tree holes, bromeliads, pitcher plants and bamboo.

Control Plans for Invasive and Nuisance Animal Species

1. Feral Hogs:

Florida Department of Environment Protection, CAMA Internal Policy for Control of Nuisance Animals states:

"CAMA considers the occurrence of feral swine on CAMA managed lands to be incompatible with its land management objectives. Therefore, to protect state property under CAMA management, aggressive action will be taken to prevent and/or control the infestation of CAMA managed lands with feral swine."

The policy above further states, "Feral swine may be harvested by catching them in traps or with dogs, or by shooting them."

Feral hogs (feral domestic swine) are descended from the wild boar (*Sus scrofa*) of Europe and were first introduced to Florida by early Spanish explorers. Feral hogs are the most prolific large mammal in the United States; a sow can have two litters per year with an average of 5 pigs per litter. The rooting activity of feral swine is destructive to biological communities. They compete for food with native animals such as white tailed deer, turkeys, squirrels, and wood ducks. Feral swine prey on reserve wildlife such as snakes and salamanders, and small mammals. They are extremely destructive to upland habitats and pose a serious threat to rare and endangered plants and animals. They damage and overtake gopher tortoise burrows. Significant archaeological and cultural resources exist on CAMA managed uplands and submerged lands of GTM Research Reserve. Feral hogs have damaged shell mounds and are a threat to these cultural resources.

The Stewardship Coordinator at GTM Research Reserve has lead responsibility to implement the control of feral hogs on reserve property. GTM Research Reserve proposes to address the feral swine problem here as below:

- Contract the repair of 7000 linear feet of hog fence on the separating GTM Research Reserve – Guana River from the Florida Fish and Wildlife Conservation Commission WMA lands. (completed in 2007)
- GTM Research Reserve Stewardship Staff will consult with FWC and other partners to implement a hog trapping effort. (A nuisance wildlife trapper licensed through FWC began feral hog trapping and eradication efforts on reserve property in March 2008). Licensed trappers shall read and sign a copy of the **DEP/CAMA Trapper's Consent to Requirements for the Removal of Feral Swine**.
- GTM Research Reserve shall take every precaution to shield the public from viewing any hog destruction activities.
- GTM Research Reserve shall take advantage of any period of public closure of the GTM Research Reserve – Guana River site for accelerated hog control activities.
- In addition to periods of public closure, the shooting of feral swine shall remain an ongoing tool of the Feral Hog Control Plan on a year-round basis. During periods of public opening, shooting of swine may only occur outside of public hours on any day. Shooting shall be limited to those areas well away from public trails and activity. Extreme caution shall be used to avoid any depredation activities that would encroach on public sensitivities.
- In accordance with OCAMA policy, firearms used by CAMA staff to harvest feral swine will be limited to .22 magnum rifles using long rifle ammunition, 12 gauge shotgun using shot no smaller than #1 buckshot, or .3006 rifles.
- GTM Research Reserve personnel involved in the harvest are limited to the Environmental Administrator and the Resource Management Staff, including the Stewardship Coordinator, Biological Scientist, and selected Park Rangers.
- All hunts on any given day will be coordinated through the Stewardship Coordinator or the Environmental Administrator.
- Reserve staff shall not use the meat, or in any way benefit from the use of these animals. No live feral swine can be removed from GTM Research Reserve lands. Swine depredated by staff are to be removed from view of any trails and left well away from public view. Because of the health risks of handling hogs, and the possible disturbance of archaeological resources, hogs may be left unburied, as long as they are out of public view. The meat from feral swine killed by any licensed trapper not employed by DEP/CAMA may be used by the trapper for personal use.
- Live cage traps baited with sour grain mash may be used to capture hogs in remote areas of the Reserve well away from public trails. All bait sites will be serviced regularly and cages secured during extended periods of non-use. Any trapped swine will be dispatched by firearm at the site, and the carcass immediately moved to a location well away from public view.
- Public and staff safety are of foremost concern during any hunt of feral swine. Efforts to insure efficient and humane depredation of feral swine is required. All reserve staff shall be made aware of the occurrence of swine brucellosis in feral hogs and methods to avoid exposure. Latex rubber gloves must be used by staff at any time they are handling swine. Any swine blood that comes in contact with human skin should be washed off immediately.
- All firearms and ammunition are to be stored under lock and unloaded on GTM Research Reserve property when not in use.

2. Feral Cats: Feral cats represent a direct threat to native wildlife species at GTM Research Reserve via direct predation on small mammals, including the Anastasia Island beach mouse. Feral cats are also known predators on songbirds, small reptiles and amphibians. They present a potential vector of infectious disease to native felids, such as the bobcat.

Feral cats are infrequently observed at GTM Research Reserve, primarily in the coastal strand habitat along SR A1A. This area is immediately across the highway from private residences, which may be contributing to the presence of the cats. GTM Research Reserve Stewardship Staff monitors these areas daily for a variety of problems, including wildlife issues. On those occasions where domestic cats are observed with a frequency to indicate feral status, have-a-hart live traps are baited and set for capture. Any feral cats captured are delivered to the St. Augustine Humane Society office.

3. Nine-banded Armadillo: Armadillos are described as a nuisance species by the Florida Fish and Wildlife Conservation Commission due to their negative impacts on native flora and fauna. The armadillo's foraging behavior disrupts ground nesting birds, reptiles and amphibians. They have been documented to disrupt gopher tortoise nesting.

The Stewardship Staff will implement control efforts to reduce populations of the nine-banded armadillo on its upland habitats through hunting with CAMA owned firearms. This practice will be implemented in conjunction with efforts to depredate feral swine, and in compliance with all precautions of that policy to prevent exposure of the public to the hunting activities on GTM Research Reserve property. Such activity will only occur during non-public hours. All staff and volunteers involved in hunting activities must be pre-approved by the GTM Research Reserve Environmental Administrator.

4. Asian Green Mussels: This bivalve species has been documented to occur in several locations in the Matanzas River drainage and at least two locations in the Tolomato River. This invasive competes with the American oyster and other native shellfish for habitat and presents the threat of significantly reducing populations of these commercially valuable resources.

The Stewardship Staff will work with the Research Staff of GTM Research Reserve to document and monitor populations of this and other invasive mollusks within the reserve. Current best management practices for control, including physical removal when practical, will be implemented.

5. Golden Apple Snail: The presence of this invasive species at GTM Research Reserve has only recently been documented. Live specimens and photographs of adults and eggs in a retention pond near Moultrie Creek at the southern end of the reserve have been obtained. The proximity of this population to Pellicer Creek Aquatic Preserve presents a serious threat to the aquatic ecosystem there. This species has become well established throughout much of south and central Florida in recent years. The golden apple snail has been observed in other location in Florida to have a very deleterious effect on aquatic vegetation.

Current eradication techniques for this species are not established. The Stewardship Staff will monitor the extent of this species at the reserve and work with Invasive Species Biologist with DEP, FWC, NPS and other cooperating agencies in an effort to develop effective control techniques.

6. Cuban Brown Anole: This species is well established in much of Florida including St. John's and Flagler counties. It competes directly with native lizards for food and habitat. It also predepates native lizard species including the green anole.

This species should be destroyed opportunistically upon encounter, using discretion to public sensitivities. The Stewardship Staff will produce educational materials to assist staff and visitors with photographs to assist in accurate identification of the Cuban anole as compared to our native lizards.

7. Cuban Tree Frog: This species is established in much of Florida and specimens have recently been captured at GTM Research Reserve. Its threat to native fauna is similar to that of the Cuban brown anole in that it directly predepates smaller native amphibians, including smaller tree frogs.

This species should be destroyed opportunistically upon encounter, using discretion to public sensitivities. Educational materials should be designed to assist staff and visitors with accurate identification of this species.

8. Fire Ants: This South American invasive insect has long been established in Florida and most of the southeastern United States. It is a well documented agricultural and ecological pest that directly predepates small native species of vertebrates as well as invertebrates. It also presents a nuisance to humans and can present a safety concern to reserve visitors.

Fire ant nest mounds should be treated upon discovery with pesticide that has been approved in advance by GTM Research Reserve staff as safe for humans and the environment. Staff and public eating areas should be monitored for cleanliness daily and cleaned frequently to prevent food attractions for fire ants.

9. Mosquitoes: The GTM Research Reserve is working cooperatively with the Anastasia Mosquito Control District to develop environmentally sound methods of controlling mosquito populations while minimizing the impact on natural biodiversity. The primary and preferred tools used to control mosquitoes within the GTM Research Reserve are the use of BTI, a bacteria-based biological control agent, DEET containing mosquito repellants, and, where feasible, trapping technologies.

Problem/nuisance Species

Alligators in Guana Lake can become a problem due to the practice of crabbing with poultry tied to a line from the shallow water of the lake. This can be dangerous for the alligator if it swallows the line that is tied to a stake firmly attached to the substrate causing the alligator great stress and possibly death. FWC is contacted if an alligator is stuck to crabbing gear or if an alligator loses its fear of humans. Trappers permitted with FWC respond and lethally remove the alligator from the area. Removals of nuisance animals such as these are carried out by FWC or associated contractors.

The marshes bordering the Guana and Tolomato Rivers are breeding sites for native Black Salt Marsh Mosquito, *Aedes taeniorhynchus*. Fresh water wetlands associated with the peninsula's central swale are sources of other mosquito species. St. Johns County's Anastasia Mosquito Control District submitted an Arthropod Control Management Plan covering the Guana River State Park to the DEP Division of Marine Resources in 1987. This plan is still in effect but should be reviewed and, if necessary, updated.

A.8 / Timber Resources

Chapters 253 and 259, Florida Statutes, require an assessment of the feasibility of managing timber in land management plans for parcels greater than 1,000 acres if the lead agency determines that timber management is not in conflict with the primary management objectives of the land. During the development of this plan, an analysis was made regarding the feasibility of timber management activities for this site (Figure 26). CAMA managed lands contain limited commercially harvestable timber, with less than 80 acres of mesic pine flatwoods within its boundary. GTMNERR staff is actively restoring this degraded mesic flatwoods through prescription burning with a goal of increased biodiversity of its uplands and enhance buffering to the watershed of the Guana and Tolomato rivers. Reserve staff is coordinating with the Division of Forestry regarding an assessment of an additional 50 acres of slash pine that have invaded a freshwater marsh on the Guana Peninsula. Reserve staff has determined that removal of this timber would be consistent with resource management goals including hydrological restoration of this marsh. DOF works exclusively with contractors who are experienced in timber removal on environmentally sensitive lands in order to insure minimal disruption to resources.

A.9 / Prescribed Fire Plan

The legislature of the State of Florida has recognized the fact that prescribed burning is a valuable land management tool and has addressed this issue with legal requirements associated with prescribed burns. These requirements include laws, rules, and policies administered by the Florida Division of Forestry, Environmental Laws and Endangered Species Laws and Rules. The primary laws are covered in Florida Statutes, Chapter 590 and Section 51-2 of the Florida Administrative Code (Appendix B.5). A summary of the legal requirements that apply to prescribed fire activity of GTM Research Reserve are listed below.

Florida Statutes Chapter 590.125

(1) DEFINITIONS.--As used in this section, the term:

- (a) "Prescribed burning" means the controlled application of fire in accordance with a written prescription for vegetative fuels under specified environmental conditions while following appropriate precautionary measures that ensure that the fire is confined to a predetermined area to accomplish the planned fire or land-management objectives.
- (b) "Certified prescribed burn manager" means an individual who successfully completes the certification program of the division and possesses a valid certification number.
- (c) "Prescription" means a written plan establishing the criteria necessary for starting, controlling, and extinguishing a prescribed burn.

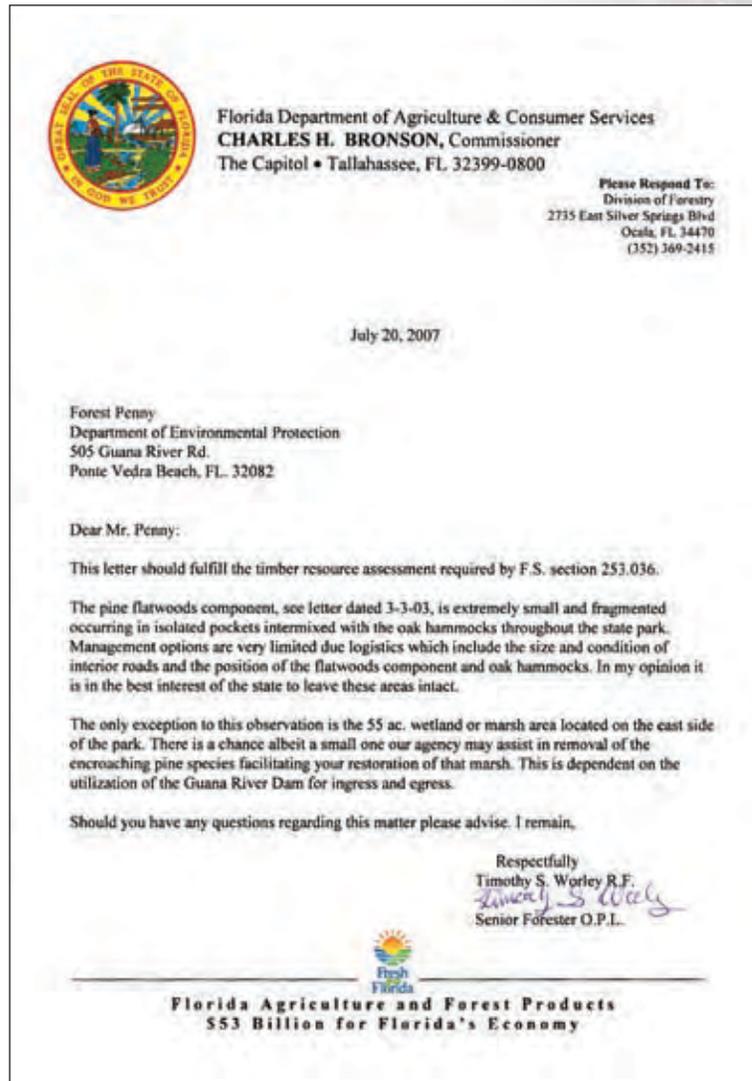


Figure 26 / Timber assessment letter.

(d) "Extinguished" means that no spreading flame for wild land burning or certified prescribed burning, and no visible flame, smoke, or emissions for vegetative land-clearing debris burning, exist.

(3) "Certified Prescribed Burning; Legislative Findings and Purpose."

(a) The application of prescribed burning is a land management tool that benefits the safety of the public, the environment, and the economy of the state. The Legislature finds that:

1. Prescribed burning reduces vegetative fuels within wild land areas. Reduction of the fuel load reduces the risk and severity of wildfire, thereby reducing the threat of loss of life and property, particularly in urban areas.
2. Most of Florida's natural communities require periodic fire for maintenance of their ecological integrity. Prescribed burning is essential to the perpetuation, restoration, and management of many plant and animal communities. Significant loss of the state's biological diversity will occur if fire is excluded from fire-dependent systems.
3. Forestland and rangeland constitute significant economic, biological, and aesthetic resources of statewide importance. Prescribed burning on forestland prepares sites for reforestation, removes undesirable competing vegetation, expedites nutrient cycling, and controls or eliminates certain forest pathogens. On rangeland, prescribed burning improves the quality and quantity of herbaceous vegetation necessary for livestock production.
4. The state purchased hundreds of thousands of acres of land for parks, preserves, wildlife management areas, forests, and other public purposes. The use of prescribed burning for management of public lands is essential to maintain the specific resource values for which these lands were acquired.
5. A public education program is necessary to make citizens and visitors aware of the public safety, resource, and economic benefits of prescribed burning.
6. Proper training in the use of prescribed burning is necessary to ensure maximum benefits and protection for the public.
7. As Florida's population continues to grow, pressures from liability issues and nuisance complaints inhibit the use of prescribed burning. Therefore, the division is urged to maximize the opportunities for prescribed burning conducted during its daytime and nighttime authorization process.

Florida Administrative Code 51-2.006 Open Burning Allowed.

(2) Open Burning for Certified Prescribed Burn Managers (CPBM). (All burning conducted under this section is related to broadcast burning for the purposes of: Silviculture, Wildlife Management, Ecological Maintenance and Restoration, Range and Pasture Management.) Open burning authorizations under this section require the Certified Prescribed Burn Manager's certification number be presented at the time of the request, and that a Certified Prescribed Burn Manager be on site for the entire burn.

(a) Prescription. A prescription for the burn must be completed prior to any ignition and it must be on site and available for inspection by a Department representative. The prescription will contain, as a minimum, (unless agreed to in writing locally between the burner and the District or Center Manager of the Division of Forestry) the following:

1. Stand or Site Description;
2. Map of the area to be burned;
3. Number of personnel and equipment types to be used on the prescribed burn;
4. Desired weather factors, including but not limited to surface wind speed and direction, transport wind speed and direction, minimum mixing height, minimum relative humidity, maximum temperature, and the minimum fine fuel moisture;
5. Desired fire behavior factors, such as type of burn technique, flame length, and rate of spread;
6. The time and date the prescription was prepared;
7. The authorization date and the time period of the authorization;
8. An evaluation and approval of the anticipated impact of the proposed burn on related smoke sensitive areas;
9. The signature and number of the Certified Prescribed Burn Manager.

(b) Open Burning Hours.

1. Daytime CPBM Authorizations will be issued for the burning to be conducted from 8:00 a.m. CT or 9:00 a.m. ET and the fire must discontinue spreading one hour after sunset.
2. Nighttime CPBM Authorizations will be issued with a Dispersion Index of 6 or above for the burning to be conducted between one hour before sunset and 8:00 a.m. CT or 9:00 a.m. ET the following day. Ignition of these fires is authorized up to midnight; however the fire can continue to spread until 8:00 a.m. CT or 9:00 a.m. ET the following day. If additional time is required a new authorization (daytime) must be obtained from the Division. The Division will issue authorizations at other times, in designated areas, when the Division has determined that atmospheric conditions in the vicinity of the burn will allow good dispersal of emissions, and the resulting smoke from the burn will not adversely impact smoke sensitive areas, e.g., highways, hospitals and airports.

(c) Burn Manager Certification Process. Certification to become a Certified Prescribed Burn Manager is accomplished by:

1. Satisfactory completion of the Division of Forestry's Prescribed Fire Correspondence Course and direct experience in three prescribed burns prior to taking the course or;

2. Satisfactory completion of the Division of Forestry's Prescribed Fire Classroom version of the Correspondence Course and a minimum of managing three prescribed burns prior to taking the course or;
 3. Satisfactory completion of the Florida Inter-Agency Basic Prescribed Fire Course and direct experience in three prescribed burns following successful completion of the classroom training. The burns conducted during the training do not count as part of this three burn requirement. - 217
 4. Applicants must submit a completed prescription for a proposed certifying burn to their local Florida Division of Forestry office prior to the burn for review and approval, and have the burn described in that prescription reviewed by the Division of Forestry during the burn operation. The local Division of Forestry District Manager (or their designee) will recommend DOF Prescribed Burn Manager certification upon satisfactory completion of both the prescription and required number of burns.
 5. In order to continue to hold the Division of Forestry Prescribed Burn Manager Certification the burner must comply with paragraph 5I-2.006(2) (d), F.A.C., or Division Certification will terminate five years from the date of issue.
- (d) Certification Renewal. A Certified Prescribed Burn Manager must satisfy the following requirements in order to retain certification.
1. Participation in a minimum of eight hours of Division of Forestry approved training every five years relating to the subject of prescribed fire, or participation in a Division of Forestry recognized Fire Council Meeting, and
 2. The Certified Prescribed Burn Manager has submitted their certification number for two completed prescribed burns in the preceding five (5) years, or
 3. Participation in five (5) burns and have this documented and verified in writing to the Forest Protection Bureau's Prescribed Fire Manager of the Division of Forestry by a current Certified Prescribed Burn Manager, or
 4. Retaking either the Prescribed Fire Correspondence Course or the Inter-Agency Basic Prescribed Fire Course.
- (e) Decertification. The Commissioner of Agriculture will revoke any Certified Prescribed Burn Manager's certification if they demonstrate that their practices and procedures repeatedly violated Florida law or agency rules or is a threat to public health, safety, or property. Recommendations for decertification by the Division of Forestry to the Commissioner of Agriculture will be based on the Certified Burner Violations – Point Assessment Table, effective July 1, 2003, which is incorporated by reference located at:
- http://www.fl-dof.com/wildfire/wf_pdfs/CBMpoints.pdf.

GTM Research Reserve Guana River Site History

Florida's natural communities have evolved over the millennia by direct influence of fire burning throughout the landscape. The majority of natural communities recognized in Florida today have existed for approximately 20,000 years. The biodiversity of many communities requires the influence of fire. Some communities have more frequent fire intervals than others and are more susceptible to carry fire. Fire frequency is dependent on the community pyrogenicity, or ease of ignition and ability to carry fire. Systems comprised mainly of herbaceous, fine fuels are usually the most pyrogenic. Systems comprised of this vegetation are responsible for the ignition of other less pyrogenic areas adjacent to or within them, such as coastal strand, oak scrub, or scrubby Flatwoods.

Florida's natural fire season can occur year round but peaks with the seasonal weather patterns that produce cloud to ground lightning, mainly thunderstorms. This time corresponds with Florida's growing season. The peak season of lightning caused fire activity in Northeast Florida is May through August. Lightning fires are most common in May and June, despite the fact that more thunderstorms occur in July and August. May is the peak of the spring-time drought and the period of low moisture content in the vegetation which contributes to this natural timing of fires.

Much of the eastern US forests had been clear-cut in the late 19th century leaving logging slash across the landscape creating dangerous fuel conditions. Devastating fires followed this unsustainable harvesting practice, which led to the organization of efforts to control wildfires. Throughout the twentieth century, forest agencies developed extensive programs to prevent or extinguish wildfires. As early as the 1970's public agencies and scientific professionals began to reexamine the role of natural fire across North America. Due to an increased understanding of the natural community ecology and the role of fire to maintain ecological integrity, fire has been reintroduced by land managers as an ecological management tool.

Because of the historical land use of the Guana Tolomato Matanzas National Estuarine Research Reserve (GMTNERR) Guana River site, fire as a natural force on the landscape was limited since the time of the first European settlement on the Guana peninsula to protect life and property. The first European settlement, a Spanish mission, *La Natividad de Nuestra Señora de Guadalupe* was established in the late 1620's and by 1689 housed 25 families. Around 1780 the British occupied the peninsula at Mount Pleasant plantation and Grant's Villa towards the southern end of the peninsula. These sites had many structures to support the crops of rice, corn, oranges, and indigo. Spain took control of Florida in 1783, the plantations were abandoned and Minorcans began to settle the peninsula in the early 1800's. By the early 1900's extensive mosquito ditching in the salt marsh and depression wetlands of the peninsula were completed altering local hydrology. Timber harvesting began in the late 1930's and continued into the 1970's with an operational sawmill on site among the pinelands of the northern peninsula. During this period the land was leased for cattle, hog grazing, apiary rights, and a hunting preserve. The landscape was actively managed for these uses.

The extent of the natural fire regime alteration is unknown. However it is evident that fire suppression of many scrub areas within the present day Reserve were allowed to succeed to the climax community of maritime hammock, which will not carry fire. Other communities were also adversely affected by fire suppression and hydrologic modifications. Subsequent to acquisition by the state, the Florida Park Service worked to re-introduce fire to the landscape as a management tool to restore the pyrogenic communities of the site. These efforts are now the responsibility of the Guana Tolomato Matanzas National Estuarine Research Reserve.

Objectives

The fire management objective of the GTM Research Reserve is the restoration of the natural fire cycle to the pyrogenic communities of the reserve to maintain their ecological integrity. The specific objectives of fire management activities are:

- Restore fire as an ecological component of the landscape
- Restore or preserve pyrogenic communities
- Restore or preserve habitat for rare plant and animal species
- Promote diversity within natural communities
- Maintain ecotones (natural transition zones) between communities
- Reduce unnatural, hazardous fuel loading

To accomplish these objectives the fire adapted communities have been separated into burn zones that can be managed by fire frequency established specifically for the communities comprising the zone (Figure 27). Each zone is surrounded by natural and/or man-made fire breaks that will ensure the containment of a controlled burn in each zone. Natural fire breaks consist of water bodies and non-combustible communities such as Oak Hammock. Man-made fire breaks consist of two track roads, ditches, trails, and maintained fire lines. A burn plan will be established each year for the zones that are scheduled to be burned within that year. Each unit to be burned within the current year will have a unit specific prescription used to accomplish the management objectives of that unit. The prescription will establish the required conditions needed to conduct a burn with the fire characteristics needed to accomplish those objectives.

Prescribed Fire Frequency

The goal of GTM Research Reserve is to restore fire as an ecological component of the landscape. Therefore the frequency of prescribed fire is dependent on the frequency established for each community by the scientific community through research and publication or by the best available ecological knowledge for that community. Some communities require frequent fires every 1 to 2 years for existence while others are adapted to less frequent, catastrophic fires, on the order of once a century. The following fire adapted communities occur at the Guana River site of the GTM Research Reserve with the listed fire interval:

Natural Community	Fire Interval
Depression Marsh	2 – 25 years
Tidal Marsh	8 – 25 years
Mesic Flatwoods	1 – 8 years
Coastal Strand	8 – 100 years
Oak scrub	8 – 25 years
Sand Pine Scrub	15 – 100 years
Coastal Dune	8 – 100 years

Due to a prolonged history of fire suppression in this area many of our communities have an excessive amount of unnatural fuel accumulation. These communities may need to be burned more frequently until the spatial configuration and composition of each community meets the habitat management goals. The management goals are based on the current state of knowledge for the “pristine” condition of each community type for this region of Florida.

Prescribed Fire Timing

The natural fire season in Florida is generally the time of year when two atmospheric conditions are met. There must be a significant amount of thunderstorm activity to induce lightning strike ignitions and the fuel moisture must be low enough to ignite and carry fire. The overall weather patterns that create these conditions occur during the late spring and early summer months in Florida when lightning ignites the vegetation and the fuels are dry enough to carry fire, often referred to as “the growing season”. Later in the year, during the peak of summer, lightning activity is high but the relative humidity and fuel moisture is often too high to burn in the environment. The pyrogenic communities in Florida have collectively evolved with this natural fire season. Re-growth is favorable during this time of year, allowing for many herbaceous species to rapidly take advantage of the post-fire environment. To best mimic the natural fire season GTM Research Reserve will conduct prescribed fires during the late spring and early summer months when the fuels of each management unit are at a natural fire maintained level.

Many of the management units in GTM Research Reserve have suffered from lack of fire for several years, in some cases decades. In this situation it would not be safe to conduct the prescribed burn during the warmer late spring

and early summer months which is also characteristic of unstable weather conditions. In this situation GTM Research Reserve will burn during the cooler, more stable periods, late fall through early spring, for staff safety and hazardous fuel reduction. Once the vegetation is in a manageable, fire maintained state, growing season burns will then be conducted in that unit. The winter season burns are not favorable because burning during this time of the year favors woody species growth that has sufficient carbohydrate stores in their root system. Burning in the non-growing season may cause a shift in the vegetation from a natural herbaceous cover to a more woody, shrub dominated cover, thus reducing the diversity of the community. *Serenoa repens* (Saw Palmetto) is a good example of a species that has sufficient energy reserves in its extensive root system. Burning in the non-growing season will likely cause an increase in *S. repens* cover.

Natural State of Communities

It is the goal of the GTM Research Reserve to restore and maintain each community type to its natural condition, or pre-Colombian existence. It is understood that there is no set measurable standard for each community. Due to the non-equilibrium status of pyrogenic communities there will be variation in configuration and composition from different patches of communities based on the disturbance regime and specific site characteristics. The purpose of GTM Research Reserve prescribed fire management is to have each community structured within the range of natural variation for that community to the greatest extent possible.

Depression Marsh: The depression marshes of the GTM Research Reserve Guana River site are relict interdunal swales from the late Pleistocene epoch when Atlantic beaches were one to four miles west of the present shoreline and sea levels were five to ten feet higher than present. This community is also known by other classification systems as an interdunal pond, interdunal freshwater wetland, or seasonal freshwater pond. The composition of this marsh should be predominantly emergent aquatic graminoids and aquatic forb species such as *Spartina bakeri*, *Juncus spp.* and *Panicum hemitomum*. Some shrubs, such as *Myrica cerifera* may become established when the hydroperiod is decreased over prolonged periods of time. Since the restoration effort to fill in mosquito ditches by the Florida Park Service, the tree cover has drastically reduced. Several areas of this community are still degraded and have a significant canopy of *Pinus elliotii*. Invading trees should be eradicated with the application of prescribed fire and mechanical treatment if necessary. Open water should also exist sporadically where depressions in the substrate allow rain fall accumulation over prolonged periods of time. This community type burns once every 2 – 25 years in Florida. GTM Research Reserve will apply prescribed fire to this community at the lower end of this frequency to control the invasion of pines and hardwoods in the marsh.

Tidal Marsh: This community occurs along the shores of the Guana and Tolomato rivers comprising 1034 acres of the Guana River site at GTM Research Reserve. It is dominated by saline graminoid emergents and forbs such as *Spartina alterniflora*, *Juncus roemarianus*, *Batis maritima*, and *Salicornia perennis*. Vegetation zonation in tidal marshes is generally controlled by soil salinity and hydroperiod although other physical and biological factors are now known to influence the vegetative equilibrium in salt marsh communities. Natural fire in the surrounding landscape can spread into this grass dominated community. This community has a burn frequency of approximately once every 8 – 25 years in Florida. The marsh will be burned within this interval when more research is conducted to better understand the ecological implications and biological feedback of fire in this ecosystem.

Mesic Flatwoods: This community constitutes approximately 20 acres of the reserve and is contiguous with a much larger expanse of Flatwoods in the Guana River Wildlife Management Area. This community is comprised predominantly of *Pinus elliotii*, *Pinus serotina*, *Serenoa repens*, *Ilex glabra*, and *Lyonia ferruginea*. The management goals for this community call for an uneven pine age structure, sparse over story, and to promote a diversity of ground cover plants. Such ground cover is important forage for *Gopherus polyphemus* of which there are currently over 60 gopher tortoise burrows in this unit. The frequency of fire in Mesic Flatwoods is once every 1 – 8 years. This unit will be burned every 1 -2 years until the *Serenoa repens* is reduced in height and cover to allow for higher diversity of ground cover plants. Mechanical treatment might be required if frequent burning does not control the *S. repens* cover within this unit.

Coastal Strand: This community covers approximately 677 acres of the Guana River site of GTM Research Reserve. Coastal strand occurs on stabilized coastal dunes with a nutrient poor, well drained sand substrate. This is a xeric community occurring in subtropical or temperate climates. In Northeast Florida it consists of dense, mixed stands of *Quercus geminata*, *Quercus myrtifolia*, *Quercus chapmanii*, *Persea borbonia*, and *Serenoa repens*. The under story is comprised of sparse, mixed, shrubs and herbaceous plants such as *Ceratiola ericoides*, *Lyonia ferruginea*, and *Vaccinium myrsinites*. The vegetation is maintained by direct influence from wind and salt spray from the ocean along with infrequent fire. These two factors work in combination to keep the shrubby vegetation low in stature, except between dunes in deep trenches shaded from the oceans salt spray influence. The leeward-most portion of this community along Guana Lake and Guana River is early successional maritime oak hammock and will not burn except during extreme drought conditions. Nearly along its entire length, the coastal strand community is gradually maturing in the absence of fire, and is changing into hammock community (xeric/maritime) through ecological succession. The natural role of fire in coastal strand is very similar to scrub communities that are found scattered throughout the Florida peninsula; they are highly dependent upon fire to maintain its community integrity (Simon 1986; Fernald, 1989; Johnson and Muller, 1993). Coastal strand naturally burns every 8 – 100 years. GTM Research Reserve will burn this community, on average, every 10 years in addition to mechanical mowing from the roadside of Highway A1A into the strand 200 feet for wildland/urban interface radiant heat concerns along the highway.

Oak Scrub: Oak scrub is similar to coastal strand in species composition but exists farther inland from the direct effects of the ocean. This community once comprised a larger extent of the Guana River site but due to fire suppression now only covers approximately 15 acres of mature scrub. Oak scrub also occurs on well drained, sandy soils farther inland

from coastal strand. This community is dominated by evergreen oaks, predominantly *Quercus geminata*, and to a lesser extent *Quercus myrtifolia* and *Quercus chapmanii*. Other species that are typical of this community are *Serenoa repens*, *Osmanthus regalis*, and *Lyonia ferruginea*. Oak scrub is a fire dependent community requiring fire every 8 – 25 years. The Florida Park Service tried to maintain this community with prescribed fire but this particular unit proved too mature to be managed by fire due to their extreme height, enclosed canopy and low level of fuels in the under story. Mechanical treatment is required to regenerate this scrub and to prevent further succession to Oak Hammock.

Sand Pine Scrub: This xeric plant community is typically dominated by an over story of *Pinus clausa* and has an under story of stunted *Quercus geminata*, *Quercus myrtifolia* and *Quercus chapmanii*. Ground cover is typically absent, especially in mature stands of *P. clausa scrub* while lichens form dense patches in some open areas. This community depends on fire and often experiences stand replacement fires resulting in even aged stands of *P. clausa*. The patch of Sand Pine scrub on the Guana River site of GTM Research Reserve is approximately 2 acres and is highly degraded with only a few *P. clausa* trees remaining. The mid-story xerophytic oak species and sparse ground cover of lichens and grasses typical of a sand pine scrub is absent at this site. Therefore this community may be too degraded for restoration with fire but every attempt will be made to maintain this Florida endemic community. Sand Pine scrub generally burns every 15 – 100 years.

Coastal Dunes: Coastal dunes in Northeast Florida are composed of dense patches of salt tolerant graminoids such as *Uniola paniculata*, *Spartina patens*, and *Sporobolus virginicus*. Farther from shore perennial herbs and *S. repens* begin to appear. Leeward of the dune crest coastal strand species dominate including *Q. geminata*, *Q. myrtifolia*, *Q. chapmanii*, *P. borbonia*. Fire on barrier islands is a natural part of the system. Florida Natural Areas Inventory lists this community as experiencing occasional or rare fire. Research on the natural fire cycle of coastal dune grasslands is limited and more research is needed to fully understand the role of natural fire in this system. GTM Research Reserve will conduct prescribed burns on the dune grasslands to promote the growth of *U. paniculata*, important forage for the Endangered Anastasia Island beach mouse (*Peromyscus polionotus phasma*) and as a measure for fuel reduction along the eastern side of US Highway A1A. A fire study program will be developed to better understand the vegetative response and fire return interval best applied to meet the management objectives of this community.

Monitoring of Prescribed Fire Activity

Monitoring the effects of prescribed fire is an important aspect of managing resources with prescribed burning. Monitoring is required to measure the effectiveness of burning and the only documented method of assessing management goals. Continuous monitoring and research of vegetation dynamics will be conducted as an important component of land management responsibilities to assess the goals and methods of prescribed fire application at GTM Research Reserve. Permanent photo-points are used to qualitatively monitor the composition and distribution of plant communities within each unit. This method will provide a valuable archive of information to measure the success of the prescribed burn program. In conjunction with photo-points, permanent vegetative sampling plots are established to quantitatively measure percent cover, composition of plant species, and species height in each plot. Faunal surveys will be developed to better understand the effects of prescribed fire treatments in the coastal strand habitat. This project will focus on small mammal and herpetological species. The quarterly beach mouse surveys will be used to study the effects of burning in the beach/dune community by following the *Peromyscus polionotus phasma* population numbers.

Photopoints: Fixed photopoints are an extremely useful, cost effective qualitative tool for documenting structural recovery and vegetation dynamics within burn units through time. The methodology for documentation with photopoints has been standardized with a protocol to be used by the staff or volunteer working on the project. The images captured at the photopoints are made up of a series of four images (orientated north, south, east and west) or three unidirectional images that are stitched together to create a panoramic of the unit. The approach that provides the best visual coverage of the vegetation in the unit is used. All photos are to be taken on a quarterly schedule. When feasible, photopoints are established at least three randomly selected locations within each burn unit to provide a good representative sample image of the area to be documented.

Vegetation Surveys: Vegetation surveys provide quantitative tool to monitor the effects of the prescribed fire program at GTM Research Reserve to assist in establishing and successfully attaining management objectives. These surveys provide data on species composition, percent cover, and average height of each species within vegetation plots or along transects. The surveys are conducted annually, in the growing season, during the month of April. This allows the GTM Research Reserve to track changes of vegetation in each burn unit. Long-term fixed-transect or quadrat vegetation surveys are established for all interior burn units and four of the coastal strand burn units to provide a representative sample of the vegetation with each unit. Units 1 – 3 have fixed quadrats of 3m X 3m located in a randomly selected field of view of the photopoints. Data recorded in each quadrat include species occurrence, percent cover of each species, and average height of the canopy and mid-story species. Within Units 4 – 18 in the coastal strand and units 19 – 25 a line intercept method is used due to the dense, scrubby vegetation. These transects are in randomly selected fixed locations in four coastal strand units and six beach/dune units. Data collected along each transect include species occurrence, percent cover, and canopy and mid-story average height. The protocol for this sampling scheme is defined in GTM Research Reserve's sampling methodology for biological data.

Coastal Strand Faunal Surveys: Methods for monitoring species response are essential to assess the short and long term impacts of management activity. Faunal surveys focus on amphibian, reptile, and small mammal species that occur in this coastal scrub type habitat. Faunal data will provide insight into the effects of the prescribed fire program and associated mechanical treatment on species assemblages and population trends. This effort will work in conjunction with a similar monitoring effort for scrub management on GRWMA by FFWCC using "Y trap arrays" to allow for more robust comparisons. The specific methodology is detailed in the GTM Research Reserve coastal strand survey protocol.

Quarterly Beach Mouse Trapping: The prescribed burn program in the beach/dune community is an experiment to examine the effects of fire on the biodiversity of this habitat. One goal of this program is to promote population growth of the *Peromyscus polionotus phasma* (Anastasia Island beach mouse). Vegetation response to burning is closely monitored using the vegetation line-intercept surveys for habitat measures. To monitor the *P. p. phasma* population response to burning, the quarterly transect surveys are used. This project has been conducted quarterly from the early 90's when this subspecies was re-introduced to this section of St. Johns County. The monitoring has been conducted in the past to follow population trends in order to determine if and when supplemental re-introductions will be needed from the Anastasia State Park and Fort Matanzas National Monument populations. This monitoring program involves three transects are set with 2 traps every 10m for a total of 40 traps per transect. The first transect (Transect A) starts at 30° 04' 08.936 N, 81° 20' 00.230 W and continues to 30° 04' 16.816 N, 81° 20' 01.954 W. The second transect (Transect B) starts at 30° 05' 49.539 N, 81° 20' 24.248 W and ends at 30° 05' 56.530 N, 81° 20' 25.960 W. The third transect (Transect C) starts at 30° 07' 26.020 N, 81° 20' 47.505 W and ends at 30° 07' 33.801 N, 81° 20' 49.373 W. Trapping is conducted for two nights each quarter and follows the protocol of the permit issued under authority of the wildlife code of the State of Florida (Title 68A, Florida Administrative Code) by the State of Florida Fish and Wildlife Conservation Commission.

Burn Unit Descriptions

Unit 1: This 59 acre unit consists of 15.5 acres of Mesic Pine Flatwoods, 27 acres of oak hammock, 15 acres of varied age oak scrub, and 1.5 acres of oak/cedar mix. The Mesic Pine Flatwoods has a dense mid-story of *Serenoa repens* and requires frequent burning and/or mechanical treatment to manage at a natural height and density. The varied age oak scrub is very mature and requires mechanical treatment to revert the scrub to an early successional stage. The scrub has reached a height making fire ineffective at maintaining the scrub. The oak hammock area does not require management activity and is used as a natural fire break. Fire breaks for this unit are the orange trail on the west and southern perimeter, the dike on the northern perimeter, and the oak hammock and blue trail on the western perimeter.

Unit 2: This 56 acre unit consists of 20 acres of freshwater depression marsh, 8 acres of freshwater marsh with a pine canopy, 5 acres of mature scrub, and 23 acres of oak hammock. This marsh is part of a larger marsh system that extends north and south along the interior of the Guana peninsula. The freshwater depression marsh suffers from pine and hardwood encroachment due to artificial drainage by a ditch on the northern end used to manipulate water levels for wildlife management in the Guana River Wildlife Management Area by the FWC. Due to the artificially shortened hydroperiod this marsh requires frequent burning to maintain graminoid and herbaceous dominance. The pine canopy of the remaining portion of the freshwater marsh is beyond controlling with prescribed fire. Mechanical and herbicide treatment will be required to remove the over story of *Pinus elliotii*. The mature scrub in this unit has succeeded to early stages of oak hammock with mature oaks and does not warrant further management. The oak hammock does not require management activity and is used as a natural fire break for this unit. Fire breaks for this unit are the dike on the northern perimeter, the blue trail and oak hammock on the east, west, and south perimeters.

Unit 3: This 190 acre unit is comprised of isolated wetlands of varying ecological integrity and small patches of *Pinus elliotii* within an oak hammock matrix. The wetlands are highly degraded due to fire suppression and water level manipulations. The wetland areas are supporting pines that were able to establish in the open substrate with low water levels and limited fire activity. Mechanical treatment is needed to restore the marsh to an open, grass dominated wetland. The pine stands are disconnected and sparse requiring a discontinuous ignition method for burning. Fire breaks for this unit are oak hammock on all perimeters and the tidal marsh on a portion of the east perimeter. ***Note: There is an active *Haliaeetus leucocephalus* (Bald Eagle) nest in this unit located at -81.33157W, 30.01722N. Please reference the United State Fish and Wildlife Service activity rules and regulations.** This unit may be burned from 16 May to 30 September (non-nesting season) and the nest tree must be excluded from burning to prevent fire induced mortality.

Units 4 – 18: These 14 units cover 678 acres of GTM Research Reserve between US Highway A1A on the east and Guana River and Guana

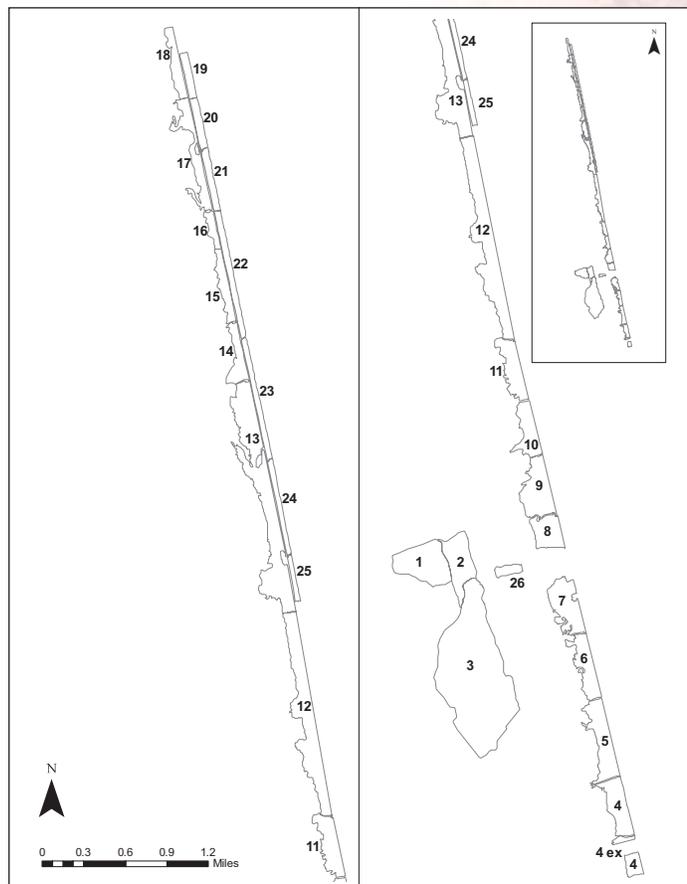


Figure 27 | GTM Research Reserve burn units.

Lake on the west. This coastal strand community is comprised of dense scrubby oaks and shrubs. On the leeward side of each unit farthest from the influence of the Atlantic Ocean the community is in the early successional stages of Maritime Hammock. A majority of these units are in the wildland/urban interface with homes a short distance across the highway. This community naturally burns very hot with high flame lengths. Due to this characteristic of coastal strand mechanical treatment is needed along the border with homes and other structures. The coastal strand will be mowed to a height of 2 feet from the highway to 200 feet into the interior. This will significantly reduce radiant heat from prescribed burns in this area protecting any adjacent structures. Fire breaks for these units are the maintained shoulder and pavement of US Highway A1A on the east perimeter, Guana River and Lake on the west perimeter, and mowed fire lines between each burn unit. Units 17 and 18 currently do not have a fire line separating each unit. A fire line was never constructed because these units have not been burned by management since the state acquired this property. These units are scheduled to be burned in 2008. Prior to burning the units will be evaluated for fire line construction. The maintained fire lines are approximately 50 feet wide and are mowed annually by reserve staff to maintain the fire protection qualities of mowed vegetation.

Units 19 – 25: These units cover 111 acres of GTM Research Reserve between US Highway A1A and the Atlantic Ocean. Each unit is composed of small remnants of coastal strand, dune vegetation and grasses. Other than the remnants of coastal strand the fuel loads are low and will be easily managed by staff. These units have not been burned by management since acquisition by the state in 1984. Fire breaks are the Atlantic Ocean on the east and US Highway A1A on the western perimeter. The divisions between each unit were located in areas of low or sparse vegetation in order to design temporary fire breaks on the northern and southern terminus of each unit. Fire break locations were also located to take advantage of the 3 beach cross-over boardwalks and the vehicular access point. Temporary fire lines will be constructed using lawn tools and wet lines with Class A foam. More permanent breaks in the vegetation may be needed on the leeward side of the dunes in the coastal strand to separate the fuel of each unit.

Unit 26: This unit covers 10 acres of GTM Research Reserve between Guana River and Guana lake impoundment. The unit lies on the Guana River dam and has naturally been vegetated by local plants and some exotic species. The area is also has the highest density of gopher tortoise burrows within the Guana River site of GTM Research Reserve. The goal of the prescribed burn program is to enhance the site for gopher tortoise forage and to control the exotic species that have colonized this area. Fire breaks are not needed for this site due to its perimeter of oak hammock, salt marsh, brackish impoundment, and parking lots.

Table 9 / Burn history (prescribed fire and wildfire).

	Year											
	1970's	1987	1988	1990	1992	1994	1996	1998	1999	2000	2003	2005
Unit 1			X				X	X				X
Unit 2			X	X		X		X	X			X
Unit 3				X		X			X	X		
Unit 4					X			X				
Unit 5					X			X				
Unit 6					X			X				
Unit 7					X			X				
Unit 8											X	
Unit 9											X	
Unit 10	X											
Unit 11	X											
Unit 12												
Unit 13								X			X	
Unit 14		X						X			X	
Unit 15		X						X				
Unit 16		X										
Unit 17		X										
Unit 18		X										
Unit 19												
Unit 20												
Unit 21												
Unit 22												
Unit 23												
Unit 24												
Unit 25												
Unit 26												

Wildfire Policy

The Florida Division of Forestry (DOF) has been given the authority and responsibility by the legislature for prevention, detection, and suppression of wildfires wherever they may occur (Chapter 590 Florida Statutes). The Division of Forestry fulfills these responsibilities by working cooperatively with other agencies, individuals, and organizations such as GTM Research Reserve.

GTM Research Reserve's policy is to let wildfires be allowed to burn out naturally if they pose no harm to life, property, or the natural community and if the weather conditions and fire behavior are beneficial to the GTM Research Reserve's fire management objectives. Appropriate action will be taken by a GTM Research Reserve Certified Prescribed Burner to obtain a permit from DOF. If there is threat of escape to property not managed by GTM Research Reserve, judgment is deferred to the DOF staff responding to the fire. Every attempt will be made to limit the amount of disturbance to the natural area from suppression activities. Burn out techniques, use of natural fire breaks, and water/foam wet lines are preferred to disking and plow lines. DOF should be notified of culturally significant resources and their locations to minimize degradation from suppression activity.

Smoke Management

Smoke management is a plan of action to conduct prescribed fires so that the smoke produced is dispersed without causing a health or safety hazard. GTM Research Reserve will utilize a smoke screening system for every prescribed burn to alleviate adverse impacts to smoke sensitive areas. Currently the Florida Division of Forestry has a tool available online to document a potential threat to a smoke sensitive area utilizing the expected weather conditions and fuel characteristics expected on the day of the burn. The smoke screening tool is located at: http://flame.fl-dof.com/wildfire/tools_sst.html#SST.

Strategies of smoke management are avoid smoke sensitive areas, disperse and dilute smoke, and reduce emissions. Smoke sensitive areas are highways, airports, communities, recreation areas, schools, hospitals, or factories. Smoke sensitive areas of GTM Research Reserve – Guana River are identified at the time the prescription is written. Critical smoke sensitive areas are areas that already have an air pollution problem or those within the probable impact area determined by fuel type and distance from fire. Critical smoke sensitive areas are located within 10% of the impact distance calculated for the fire acreage and fuel type. Prescribed burns will be conducted on each unit in a manner to prevent the dispersion of smoke in the direction of the identified smoke sensitive areas. GTM Research Reserve will conduct burns during weather conditions that promote the dispersion and dilution of smoke. The minimum level of each factor are conditions are mixing height above 1700 feet, transport wind speed of 9 mph, and background visibility of at least 5 miles. In order to reduce emissions the type of firing technique to be used will be determined by the fuel load and type of each unit at the time of burning. Backing fires generally reduce emissions by combusting the fuel completely. Evaluating moisture content of fuels to ensure the duff layer and larger non-target fuels will not ignite is another strategy to reduce emissions. Completing the burn earlier in the day and initiating mop-up when practical will also reduce residual smoke that often causes emissions problems with smoke sensitive areas.

Fire Line Construction

Fire lines are required to control prescribed burns on sub-divided units of continuous fuels. Natural features (ponds, non-combustible communities) are used where they provide adequate protection and control of fire in each burn unit. Existing roads and trails are also utilized to prevent further damage to the natural communities of the GTM Research Reserve. GTM Research Reserve currently only maintains constructed fire lines within the coastal strand adjacent to US Highway A1A (Figure 28). Additional fire line construction is needed in the coastal strand between units that have not been burned for management objectives. Prescribed fire in the Beach/Dune community will require temporary fire line construction with landscape equipment and Class A foam for wet line control. The perimeter of all other burn units utilizes natural features of the landscape or maintained trails that are frequently mowed to reduce vegetation height.

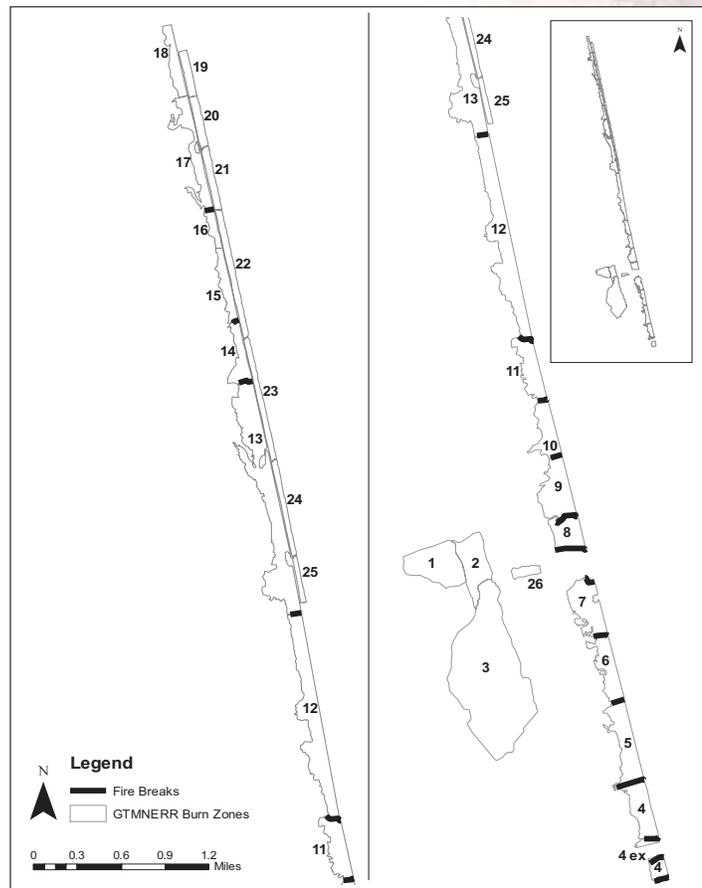


Figure 28 / GTM Research Reserve maintained fire lines.

Prescribed Burning Staff Training

Staff training will follow the guidelines established by the Office of Coastal and Aquatic Managed Areas “Prescribed Burning Procedures” and the Florida Interagency Prescribed Fire Training requirements for the functional positions used for prescribed fire operations at GTM Research Reserve.

A.10 / Potential Surplus Lands

There are no potential surplus lands within this management unit. Maintenance of the ecosystem functions and ecological value of the property requires conservation in perpetuity.

A.11 / Budget Summary Table

The following table is a summary of the issues, goals, objectives, strategies and performance measures identified in Chapter 6. The “Status” column identifies the current state (initiated or not initiated) of the activity. An “I” in this column indicates if this is an activity that is already underway. The “Type” column indicates if the activity will be repeated (typically annually) and the “Cost Estimate” column identifies the anticipated costs associated with the strategy not including infrastructure maintenance or personnel. Budget categories identified correlate with the CAMA Management Program Teams and NOAA Funded Programs and translate to those used by the Land Management Uniform Cost Accounting Council (pursuant to 259.037, F.S.) Headings: Ecosystem Science, Education and Outreach, and Resource Management. Please see chapters seven and eight for a detailed overview of the GTM Research Reserve’s Administration (Personnel Cost Estimates) and Facilities Plan (Infrastructure Improvement Costs).

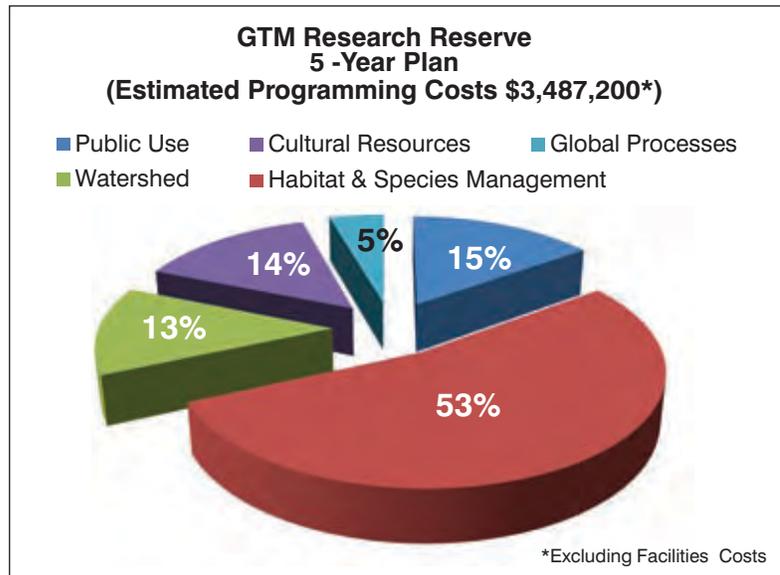


Figure 29 | Estimated programming costs for full implementation.

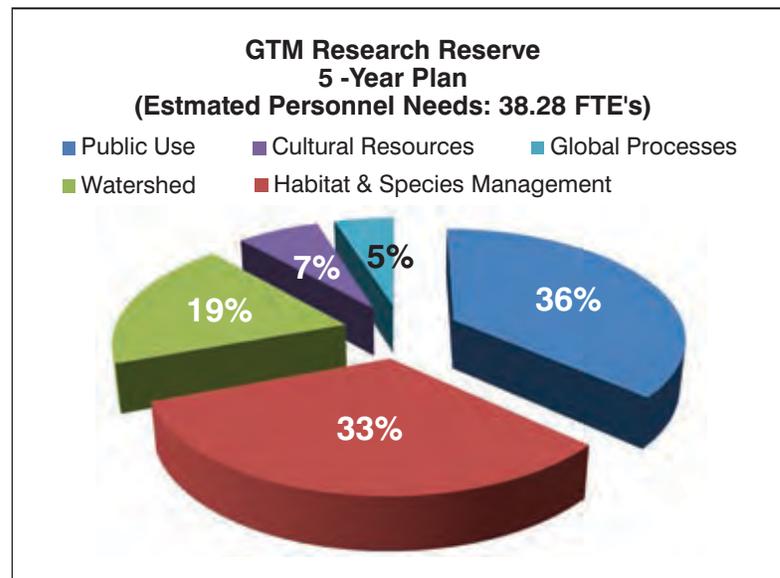


Figure 30 | Estimated personnel needs for full implementation.

Table 10 / Strategies: estimated timeline and cost.

Public Use					
Goal: Ensure user experiences are sustainable and consistent with natural and cultural resource protection for the benefit of existing and future generations.					
Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
Objective One: Improve trail user satisfaction and sustain habitat quality by anticipating and reducing conflicts between trail users and tracking habitat condition.					
Ecosystem Science Strategies:					
1. Summarize carrying capacity research and user survey results for integration into the GTM Research Reserve’s education and stewardship programs.	N	R	0.03	\$500	2
2. Monitor change in habitat condition immediately adjacent to the trails to detect impacts to natural biodiversity.	N	R	0.075	\$15,000	2
Resource Management Strategies:					
1. Work cooperatively with specific user groups to develop and implement a comprehensive trail use plan.	N	NR	0.12	\$3,000	2
2. Encourage and facilitate additional staff and law enforcement presence on the trails.	I	R	0.15	\$5,000	1
3. Develop and install signs to direct different user types to the most appropriate trails.	I	NR	0.09	\$5,000	1
Education and Outreach Strategies:					
1. Provide part-time seasonal staff to guide and welcome users to enhance the appreciation of the resource and promote stewardship.	N	R	0.6	\$8,000	3
2. Design all future signs and brochures using universal symbols.	N	R	0.03	\$500	2
3. Periodically conduct professionally developed trail user satisfaction surveys.	N	R	0.3	\$35,000	3
Performance Measures:					
1. Trends in user satisfaction surveys.	N	R	0.015	\$500	3
2. Trends in law enforcement citations/incidents.	I	R	0.015	\$250	1
3. Trends in sensitive species change analyses or the habitats immediately adjacent to the trails as compared to control sites.	N	R	0.015	\$250	3
4. Trends in user patterns to assess the number of users by trail type and to detect changes to the distribution of user types.	N	R	0.015	\$250	1
Objective Two: Improve accessibility to the trail system and improve educational opportunities for user groups with special needs.					
Ecosystem Science Strategies:					
1. Maintain and summarize database of visitor use surveys for integration into the GTM Research Reserve’s stewardship and education program.	N	R	0.3	\$500	3
Resource Management Strategies:					
1. Evaluate existing boardwalk design and, if feasible, retrofit to improve amenities for users with special needs.	N	NR	0.09	\$12,000	1
Education and Outreach Strategies:					
1. Assess methods used by other “park” and wildlife management areas to improve interpretation programming for users with special needs.	N	N	0.09	\$6,000	2
2. In partnership with other environmental educational organizations and agencies, increase educational programming for users with special needs.	N	R	0.09	\$5,000	4
Performance Measures:					
1. Trends in use by visitors with special needs.	N	R	0.015	\$250	4
2. Results of trail user surveys.	N	R	0.015	\$250	2
Objective Three: Enhance the amenities associated with compatible public use of the dam and surrounding estuaries.					
Ecosystem Science Strategies:					
1. Summarize user survey information on amenities for integration into the stewardship and education program.	N	R	0.015	\$250	4

Public Use

Goal: Ensure user experiences are sustainable and consistent with natural and cultural resource protection for the benefit of existing and future generations.

Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
Resource Management Strategies:					
1. Design and, if feasible, implement a solution to boat ramp and walkway erosion.	N	NR	0.09	\$25,000	1
2. Maintain two weekend year-round gate keepers on staff to increase staff member presence at the dam, to directly communicate with recreational users of this portion to the reserve, to collect use data for performance measures, to ensure access is not dependent on gate function, and to alert users of parking lot capacity.	N	R	3	\$5,000	1
Education and Outreach Strategies:					
1. Provide a weekend part-time naturalist to conduct guided marsh and trail programs during peak tourist season.	N	R	0.6	\$5,000	1
2. Design and conduct a user survey to prioritize implementation of resource compatible amenities and gauge satisfaction.	N	R	0.09	\$25,000	4
Performance Measures:					
1. Trends in user satisfaction surveys.	N	R	0.015	\$250	4
2. Trends in attendance at events.	N	R	0.015	\$250	4
3. Trends in user numbers accessing the dam and trails.	N	R	0.015	\$250	1
Objective Four: Increase public awareness of the GTM Research Reserve and support of its mission.					
Ecosystem Science Strategies:					
1. Develop a GTM Research Reserve Site Profile to summarize existing research information and to identify additional research needs for students and visiting investigators.	I	NR	0.24	\$30,000	1
2. Provide input into the GTM Research Reserve user guide and annual "State of the GTM Research Reserve" workshop.	N	R	0.045	\$500	2
Resource Management Strategies:					
1. Provide input into the GTM Research Reserve user guide and an annual "State of the GTM Research Reserve" workshop.	N	R	.01	\$250	1
Education and Outreach Strategies:					
1. Develop a GTM Research Reserve user guide highlighting recreational and educational opportunities within the GTM Research Reserve's entire boundary (partnering and coordinating with all agencies managing natural recreational lands within and adjacent to the GTM Research Reserve boundaries).	N	N	0.15	\$20,000	5
2. In partnership with all agencies managing land within the GTM Research Reserve's boundary organize and conduct annual "State of the GTM Research Reserve" workshop providing information to newspapers and other media to inform the local citizenry of the status and trends in species biodiversity, public use, pollution, and habitat conservation.	N	R	0.09	\$2,500	2
3. Develop and update a formal marketing plan for the GTM Research Reserve.	N	R	0.06	\$5,000	3
4. Correct all traffic signs and maps locating the GTM Research Reserve and specific resources.	N	NR	0.03	\$5,000	1
5. Enhance and update all GTM Research Reserve Websites (local, State and NERR) as needed.	I	R	0.03	\$5,000	1
6. Organize and implement events to highlight the GTM Research Reserve's 10 year anniversary in 2009.	N	NR	0.12	\$15,000	2
7. Continue to host annual National Estuaries Day and Florida's Birding and Foto Fest.	I	R	0.12	\$5,000	1
8. Work in cooperation with St. Johns County Government Television to develop programming that highlights the GTM Research Reserve's resources and issues.	I	R	0.075	\$10,000	1
Performance Measures:					
1. Completed GTM Research Reserve site profile.	I	NR	0.015	\$250	1
2. "State of the GTM Research Reserve" workshops conducted and attendance.	N	R	0.015	\$250	2

Public Use

Goal: Ensure user experiences are sustainable and consistent with natural and cultural resource protection for the benefit of existing and future generations.

Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
3. Completed GTM Research Reserve user guide.	N	NR	0.015	\$250	5
4. Correct information on signs and publications identifying or describing the GTM Research Reserve.	N	R	0.015	\$250	2
5. Development and implementation of a formal marketing plan.	N	NR	0.015	\$250	4
6. Attendance at the 10 year anniversary events, Estuaries Day and the Birding and Foto Fest.	N	NR	0.015	\$250	3
7. Hours of government television programming developed.	N	R	0.015	\$250	2
Objective Five: Enhance issue based information at the beach parking lots highlighting the GTM Research Reserve's mission, current resource information and recreational opportunities.					
Ecosystem Science Strategies:					
1. Summarize beach species monitoring data for integration into the parking lot kiosks and beach nature walks.	N	R	0.03	\$500	3
Resource Management Strategies:					
1. Explore, and if feasible, conduct native plant dune restoration projects in coordination with educational programming.	I	R	0.09	\$15,000	1
Education and Outreach Strategies:					
1. Review existing signage and design new signs and kiosks allowing for dynamic resource updates that provide information on Environmental Education Center (EEC) location, resource issues, and current events.	N	R	0.09	\$15,000	2
2. Design and conduct user surveys incorporating resource specific questions to test user knowledge of beach habitats and the mission of the GTM Research Reserve.	N	R	0.075	\$25,000	4
Performance Measures:					
1. Increasing trends in user knowledge of beach habitats and the GTM Research Reserve's mission based on user survey responses.	N	R	0.015	\$250	5
2. Decreasing trends in unauthorized dune crossovers, litter, and nest disturbance.			0.015	\$250	1
Objective Six: Reduce unauthorized activities associated with the trail system.					
Ecosystem Science Strategies:					
1. Monitor and record data regarding the disturbance of sentinel habitats and cultural resource sites.	I	R	0.075	\$10,000	1
2. Summarize disturbance monitoring research results for integration into the GTM Research Reserve's education and stewardship programs.	N	R	0.015	\$250	2
Resource Management Strategies:					
1. Encourage additional law enforcement patrols.	I	R	0.015	\$500	1
2. Increase staff time in the vicinity of cultural resources and sensitive natural resources at peak visitor use times.	N	R	0.075	\$500	2
3. Install enforceable signage to educate trail users of the significance of the area's natural and cultural resources and up-to-date regulations	I	NR	0.06	\$1,000	1
Education and Outreach Strategies:					
1. Conduct annual Cultural and Natural Resources Law Enforcement workshops targeting the GTM Research Reserve staff, volunteers, law enforcement officials, and trail users.	I	R	0.09	\$2,000	2
2. Develop enforceable signage to educate trail users of the significance of the area's natural and cultural resources and up-to-date regulations.	I	R	0.06	\$1,000	1
3. When feasible, include a natural and cultural resources section to trail etiquette signs.	N	R	0.015	\$500	2
4. Submit information to newspaper and other public media on the topic of cultural and natural resource stewardship and the trail experience.	N	R	0.03	\$1,000	3

Public Use

Goal: Ensure user experiences are sustainable and consistent with natural and cultural resource protection for the benefit of existing and future generations.

Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
Performance Measures:					
1. Trends in law enforcement activities and citations.	I	R	0.015	\$250	1
2. Trends site disturbance.	N	R	0.015	\$250	2
3. Trends in user behavior patterns within the trail system.	N	R	0.015	\$250	1
Objective Seven: Reduce the daily accumulation of litter at the dam to quantities that can be collected by volunteers and staff to improve public and wildlife safety.					
Ecosystem Science Strategies:					
1. Periodically generate and summarize a dataset that identifies the amount and type of litter generated.	N	R	0.03	\$500	3
Resource Management Strategies:					
1. Enforcement of anti-litter laws and habitat protection rules.	I	R	0.075	\$500	1
2. Increase staff member presence at this high use recreational location.	I	R	0.75	\$2,000	1
3. Conduct community/volunteer cleanup days.	I	R	0.075	\$2,500	1
4. Maintain monofilament recycling stations.	C	R	0.075	\$1,000	1
5. Install signage using universal symbols to ensure clear communication with all user groups.	N	NR	0.075	\$500	1
6. Install wildlife proof trash bins to prevent raccoons from pulling trash out of containers at night.	N	NR	0.075	\$2,500	1
7. Empty trash containers more frequently to prevent containers from filling.	C	NR	0.075	\$500	1
Education and Outreach Strategies:					
1. Design signage using universal symbols to ensure clear communication to all user groups.	N	R	0.06	\$250	3
2. Staff a part-time naturalist specially trained in rules and common violations to be at the dam during peak fishing times.	N	R	0.75	\$2,500	2
Performance Measures:					
1. Decreasing trend in litter generated at the dam.	C	R	0.015	\$250	1
2. Increasing trend in the amounts of voluntarily collected monofilament.	I	R	0.015	\$250	1
Objective Eight: Reduce the number of fishing regulation violations at the dam between sunset and closing.					
Ecosystem Science Strategies:					
1. Obtain law enforcement activity reports and create a database of fishing regulation violations for integration into the GTM Research Reserve's stewardship and education program.	N	R	0.015	\$250	2
Resource Management Strategies:					
1. Increased ranger and law enforcement presence between sunset and closing, and document number of patrols in area for performance measuring.	N	R	0.015	\$250	2
2. Increase ranger interaction with recreational users between sunset and closing to promote compliance of rules.	N	R	0.375	\$1,000	2
Education and Outreach Strategies:					
1. In cooperation with FWC, conduct fishing clinics that emphasize conservation messages targeting users between sunset and closing.	N	R	0.075	\$2,000	4
Performance Measures:					
1. Decreasing trend in the number of law enforcement citations versus patrols conducted between sunset and closing.	N	R	0.015	\$250	3
Objective Nine: Reduce the amount of beach litter and identify the source.					
Ecosystem Science Strategies:					
1. In coordination with community clean-up events and the International Coastal Clean-up conduct an assessment of litter by type and amount.	N	R	0.06	\$500	2

Public Use

Goal: Ensure user experiences are sustainable and consistent with natural and cultural resource protection for the benefit of existing and future generations.

Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
2. Summarize ecosystem science strategies results for integration into the GTM Research Reserve's education and stewardship program.	N	NR	0.03	\$250	2
3. Maintain and summarize a wildlife injury database.	I	R	0.075	\$500	1
Resource Management Strategies:					
1. Continue to maintain trash containers and monofilament recycling stations in beach parking lots.	C	NR	0.075	\$500	1
2. Provide additional raccoon-proof trash containers on the beach side of boardwalks to increase likelihood of users to dispose of trash properly.	N	NR	0.075	\$1,000	1
3. Increase weekend ranger and volunteer presence on the beach to improve compliance and cleanup during patrols.	N	R	0.375	\$2,500	2
4. Establish volunteer ranger positions to patrol beaches in morning to pick up trash.	N	R	0.075	\$2,000	2
Education and Outreach Strategies:					
1. In cooperation with Flagler and St. Johns County support an "Adopt a Beach" program.	I	R	0.075	\$2,500	1
2. Host community beach clean-up events.	I	R	0.075	\$2,500	1
3. Highlight the danger of litter to wildlife in education programs with beach kiosks.	N	R	0.015	\$500	4
4. Update parking lot signage to reflect the "leave no trace" theme.	N	R	0.015	\$500	4
Performance Measures:					
1. Reducing trends in the quantity the most damaging and preventable beach litter.	N	R	0.015	\$250	1
2. Reducing trends in the number of litter-associated wildlife injuries.	I	R	0.015	\$250	1
Objective Ten: Reduce disturbance of nocturnal species and sensitive habitats and improve public safety.					
Ecosystem Science Strategies:					
1. Maintain a database of parking violations to track repeat offenders, the numbers of vehicles parked beyond hours of operations by parking lot, overnight habitat damage and law enforcement citations.	N	R	0.075	\$500	1
2. Summarize data for incorporation into the GTM Research Reserve's stewardship program.	N	R	0.015	\$250	1
Resource Management Strategies:					
1. Issue warning notices for late parkers, issue tickets with fines, and as a last resort tow vehicles of repeat violators.	N	R	0.375	\$2,500	3
2. Explore feasibility of installing automatic gates or pass dispensers at the entrances to the beach parking lots.	N	NR	0.09	\$90,000	1
3. Install signs at beachside that clearly state that the lot closes at sunset and the penalties for violations.	N	NR	0.03	\$500	1
Education and Outreach Strategies:					
1. Clearly inform the public of the hours of operation and consequences of remaining in the lot after hours (e.g., fines).	N	R	0.075	\$1,000	1
Performance Measures:					
1. Trends in the number of cars parked beyond the hours of operation and repeat offenders.	N	R	0.015	\$250	1
2. Trends after hours law enforcement citations at the beach and parking lots.	I	R	0.015	\$250	1
3. Trends in overnight human disturbance of beach habitats and species.	N	R	0.015	\$250	2
Objective Eleven: Improve compliance of future docks with Aquatic Preserve rules.					
Ecosystem Science Strategies:					
1. Conduct or facilitate and review scientific literature examining the impact of docks on benthic community structure.	N	NR	0.03	\$45,000	2

Public Use

Goal: Ensure user experiences are sustainable and consistent with natural and cultural resource protection for the benefit of existing and future generations.

Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
2. Maintain a database of authorized docks and structures in the GTM Research Reserve's Aquatic Preserves' boundaries.	N	R	0.075	\$1,000	3
3. Integrate information from literature reviews into the GTM Research Reserve's education and stewardship program.	N	NR	0.015	\$500	2
Resource Management Strategies:					
1. Ensure that Aquatic Preserve Boundaries are known by dock permit applicants and reviewers.	N	R	0.3	\$2,500	2
2. Proactively identify projects for meeting public interest criteria linked to the GTM Research Reserves management plan strategies.	I	R	0.15	\$500	1
3. Wherever practical post the Aquatic Preserve boundary.	N	NR	0.075	\$500	
4. Use GIS to identify and document existing and new dock locations relative to the GTM Research Reserve's Aquatic Preserves' boundaries.	N	R	0.075	\$1,000	3
5. Track authorized dock permits within the aquatic preserves' boundaries.	N	R	0.075	\$250	2
6. Determine ownership and post CAMA managed spoil islands within the GTM Research Reserve.	N	NR	0.075	\$500	1
7. Promote the use and distribution of the Aquatic Preserve Rule training video.	I	R	0.075	\$1,500	1
Education and Outreach Strategies:					
1. Conduct periodic Aquatic Preserve Rule training workshops for regulatory staff as requested.	I	R	0.075	\$2,500	1
2. Conduct dock builder workshops.	I	R	0.075	\$2,500	1
3. Encourage comprehensive marine, mooring and dock planning that considers long-term cumulative effects.	I	R	0.075	\$250	1
4. Provide workshops and technical assistance as requested by county and city governments.	I	R	0.075	\$2,500	1
Performance Measures:					
1. Reducing trends in the number of unauthorized structures or docks within the Aquatic Preserves.	N	R	0.015	\$250	3
2. Trends in the development and implementation of comprehensive marina, mooring and dock planning by local governments.	N	R	0.015	\$250	2
Objective Twelve: Reduce damage to beach habitats and instances of wildlife harassment by unleashed domestic animals.					
Ecosystem Science Strategies:					
1. Review and summarize scientific literature to ascertain the critical alarm distance for nesting birds for various domestic animal activities.	N	R	0.03	\$500	2
2. Summarize research results for integration into the GTM Research Reserve's education and stewardship program.	N	NR	0.015	\$250	3
3. Maintain and summarize a database of wildlife harassment incidents and habitat damage associated with domestic animals.	N	R	0.075	\$500	2
Resource Management Strategies:					
1. Encourage consistent enforcement of applicable laws, regulations, and ordinances, particularly during least tern and sea turtle nesting season.	N	R	0.075	\$500	2
2. Clearly post regulations at all legal crossover locations.	I	NR	0.075	\$500	1
3. Create beach patrol volunteer positions and/or staff to regularly patrol and monitor the beach on the weekend to promote proper beach etiquette.	N	R	0.375	\$2,500	2
Education and Outreach:					
1. Provide up-to-date information on the sensitivity of nesting birds to unleashed dogs and cats (beach signage, educational programming and outreach) using alarm distance research.	N	R	0.075	\$500	4

Public Use

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Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
Performance Measures:					
1. Reducing trends in the number of turtle and least tern nests damaged due to domestic animals.	I	R	0.015	\$250	1
2. Reducing trends in the number of incidents of wildlife harmed or harassed by leashed and unleashed domestic animals.	N	R	0.015	\$250	2
Total			14.025	\$525,000	

Habitat and Species Management

Goal: Improve the conservation of natural biodiversity by implementing the principles of adaptive management and ecosystem science.

Objectives/Strategies/Performance Measures	Status	Type	Est. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
Objective Thirteen: Develop a habitat map for the GTM Research Reserve's tidal and submerged resources to support change analyses.					
Ecosystem Science Strategies:					
1. Conduct or facilitate research to map submerged habitat sediment grain size, bathymetry, hard-bottom resources and tidal marsh to serve as baseline for future change analyses and habitat suitability modeling efforts.	I	NR	0.12	\$75,000	1
2. Summarize research results for integration into the GTM Research Reserve's education and stewardship program.	N	NR	0.03	\$250	2
3. Continue existing and develop new partnerships with other agencies and universities to accomplish benthic mapping needs of this region.	N	NR	0.06	\$500	3
4. Assist the Friends of the GTM Reserve and other partners in pursuit of grants to help fund and administer positions for conducting research and resource management projects.	N	R	0.03	\$250	3
Resource Management Strategies:					
1. Provide GIS and GPS support for habitat mapping and ground truthing.	I	R	0.15	\$3,000	1
2. Use the results of habitat change analyses to guide and assess the GTM Research Reserve's restoration activities.	N	R	0.09	\$250	5
Education and Outreach Strategies:					
1. Incorporate habitat change information as it becomes available into educational programming and outreach materials.	N	R	0.03	\$500	5
2. Conduct workshops on tidal and submerged habitat mapping and change technologies.	I	R	0.09	\$1,500	1
3. Incorporate the results of the GTM Research Reserve's habitat change assessment into an annual "State of the GTM Research Reserve" workshop.	N	R	0.06	\$500	2
Performance Measures:					
1. The percent area mapped by coverage type.	I	R	0.015	\$250	1
2. An accuracy assessment of data generated from mapping effort.	N	R	0.24	\$2,500	2
3. Initiation and implementation of mapping projects for trend analysis.	N	R	0.015	\$250	3
Objective Fourteen: Initiate long-term biological monitoring of estuarine species composition (including nonnative species) to support change analyses of the GTM Research Reserve estuarine biodiversity.					
Ecosystem Science Strategies:					
1. Facilitate or conduct projects to initiate long-term biological monitoring at multiple trophic levels within selected habitats.	I	R	0.3	\$45,000	1

Habitat and Species Management

Goal: Improve the conservation of natural biodiversity by implementing the principles of adaptive management and ecosystem science.

Objectives/Strategies/Performance Measures	Status	Type	Est. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
2. Facilitate or conduct creel census or otherwise obtain data related to the GTM Research Reserve's recreational and commercial fisheries productivity to follow and report on trends in species biodiversity, biomass and abundance.	N	R	0.3	\$40,000	4
3. Summarize research results for integration into the GTM Research Reserve's education and stewardship program	N	R	0.06	\$250	2
Resource Management Strategies:					
1. Provide GIS and GPS support for habitat biological monitoring.	I	R	0.09	\$5,000	1
Education and Outreach Strategies:					
1. Incorporate biodiversity information as it becomes available into educational programming and outreach materials.	N	R	0.06	\$500	4
2. Conduct workshops on GIS modeling to support conservation of biodiversity.	N	R	0.09	\$500	2
3. Provide training opportunities to staff and volunteers for recording, managing and analyzing trends in ecological datasets.	N	R	0.3	\$2,500	3
Performance Measures:					
1. Number of long-term monitoring projects initiated.	I	R	0.015	\$250	
2. Number of samples collected or surveys completed.	N	R	0.03	\$250	2
3. GIS products produced that support habitat change initiatives.	I	R	0.03	\$250	1
Objective Fifteen: Reduce the frequency of off-road vehicle damage and restore damaged salt marsh habitat along the AIWW.					
Ecosystem Science Strategies:					
1. Facilitate or conduct research and summarize published literature on salt marsh resiliency to physical damage.	N	NR	0.09	\$1,000	3
2. Summarize information from the GTM Research Reserve affiliated research projects and literature reviews for integration into the GTM Research Reserve's education and stewardship program.	N	R	0.03	\$500	3
3. Establish a photo-point database of off-road vehicle damage and habitat recovery projects by location.	N	R	0.15	\$2,500	2
Resource Management Strategies:					
1. Report any unauthorized vehicle activities harming salt marsh habitat to the appropriate regulatory agency.	I	R	0.015	\$250	1
2. When feasible, fence, post, and re-vegetate unauthorized access points.	I	R	0.09	\$15,000	1
3. Provide GIS support to track damage by unauthorized vehicles.	N	R	0.015	\$500	2
4. Conduct regular staff or volunteer patrols, including aerial, water, and terrestrial surveys, to monitor for vehicle and other damage.	I	R	0.3	\$1,000	1
Education and Outreach Strategies:					
1. Provide information concerning marsh habitat resiliency through displays, fact-sheets, posters, K-12 programming, and public outreach activities.	N	R	0.09	\$500	4
2. Produce press releases for newspapers about the issue and its ecological effects.	N	R	0.15	\$2,400	2
3. Partner with homeowners associations and ATV distributors to promote awareness of marsh habitats and their sensitivity to vehicle traffic.	N	R	0.015	\$500	2
Performance Measures:					
1. Trends in patterns or frequency of salt marsh damage attributed to off-road vehicles.	N	R	0.015	\$250	2
2. Trends in the number of staff/volunteer patrols of salt marsh habitat along the AIWW.	N	R	0.015	\$250	3

Habitat and Species Management

Goal: Improve the conservation of natural biodiversity by implementing the principles of adaptive management and ecosystem science.

Objectives/Strategies/Performance Measures	Status	Type	Est. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
Objective Sixteen: Identify the current status, biological significance, and source of water column, sediment and oyster tissue contaminants to support the tracking of long-term changes in the biological significance, source and trends in water column, sediment and oyster tissue contaminants.					
Ecosystem Science Strategies:					
1. In partnership with State Universities pursue National Science Foundation's Long-Term Ecological Reserve network status for the GTM Research Reserve to focus additional scientific resources on this issue.	N	R	0.12	\$2,000	3
2. Facilitate or conduct modeling and long-term monitoring to identify the current status, biological significance, source, and trends in water column nutrient concentrations and sediment and oyster tissue pesticide, PAH, and heavy metal concentrations.	I	R	0.24	\$150,000	3
3. Support continuation and full implementation of the NERR System-Wide Monitoring Program (SWMP).	I	R	0.6	\$250,000	1
4. Conduct or facilitate monitoring along suspected pollutant gradients affecting the GTM Research Reserve (e.g., Ponte Vedra Lake drainage system, headwaters of Pellicer Creek, Tributaries of the Tolomato and Matanzas Rivers).	I	R	0.075	\$10,000	1
5. Use SWMP datasets to examine indicators of estuarine health such as duration of hypoxia, salinity change, turbidity and nutrient concentrations.	I	R	0.15	\$110,000	1
6. Assist the Friends of the Reserve and other partners in pursuit of grants to help fund research and monitoring projects.	N	R	0.075	\$500	2
7. Summarize research results for integration into the GTM Research Reserve's education and stewardship program.	N	R	0.06	\$250	2
Resource Management Strategies:					
1. Provide GIS and GPS support for water quality and contaminant monitoring.	N	R	0.075	\$2,000	2
2. Develop trained volunteer based monitoring programs.	I	R	0.09	\$2,000	1
3. Partner with DEP's TMDL Program, St. Johns River Water Management District (SJRWMD), Florida Department of Agriculture and Consumer Services (FDACS), and the Department of Health (DOH) to obtain current data on water body classification affecting oyster harvesting and water quality.	I	R	0.06	\$250	2
Education and Outreach Strategies:					
1. Incorporate water quality and contaminant information as it becomes available into educational programming and outreach materials.	I	R	0.09	\$500	1
2. Incorporate information regarding pollutant sources, status and trends and potential solutions into an annual "State of the GTM Research Reserve" workshop.	N	R	0.03	\$500	2
3. Initiate a volunteer based (e.g., Lake watch) water quality monitoring program for Pellicer Creek and Guana River.	N	R	0.075	\$45,000	3
Performance Measures:					
1. Number of monitoring programs initiated by pollutant type.	N	R	0.015	\$250	3
2. Number of biomonitoring tools tested, developed and implemented.	N	R	0.015	\$250	3
3. Continued implementation of the NERR SWMP.	I	R	0.015	\$250	1
4. Pollutant sources, status and trends are identified and prioritized.	N	R	0.015	\$250	3
5. Trends in the duration of hypoxia, salinity change, turbidity and nutrient concentrations are analyzed and interpreted.	I	R	0.015	\$250	1

Habitat and Species Management

Goal: Improve the conservation of natural biodiversity by implementing the principles of adaptive management and ecosystem science.

Objectives/Strategies/Performance Measures	Status	Type	Est. FTE	Cost Estimate	Plan Year Initiated
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I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring

Objective Seventeen: Reduce mortality of by-catch associated with activities at the dam.

Ecosystem Science Strategies:

1. Conduct periodic surveys to monitor the amount and type of by-catch	N	R	0.15	\$250	2
2. Summarize monitoring results for integration into the GTM Research Reserve's education and stewardship program.	N	R	0.12	\$250	2

Resource Management Strategies:

1. Identify and obtain local sponsorship for circle hook promotions.	N	R	0.075	\$500	4
2. Estimate and record by-catch disposal at the dam through periodic patrols at the dam and during clean-ups.	N	R	0.075	\$250	2
3. Increase staff/volunteer presence at the dam to promote compliance and encourage the release of by-catch.	I	R	0.3	\$500	1
4. Promote catch and release fishing activities.	N	R	0.075	\$1,000	4

Education and Outreach Strategies:

1. Provide educational material on the ecological importance of by-catch.	N	R	0.075	\$250	4
2. Promote the use of circle hooks in cooperation with FWC.	N	R	0.075	\$250	4

Performance Measures:

1. Trends in by-catch at the Guana River Dam based on the clean-up dataset.	N	R	0.12	\$250	3
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Objective Eighteen: Achieve measurable progress toward resolving issues concerning the sustainability of the commercial and recreational fisheries at the dam to ensure spillway management supports the sustainability of the commercial and recreational fisheries at the dam.

Ecosystem Science Strategies:

1. Facilitate or conduct long-term monitoring of the Guana estuary fish and shellfish populations and water quality conditions on either side of the Guana River Dam especially during spillway water releases and up-river overflow events.	N	R	0.3	\$50,000	2
2. Summarize monitoring results for integration into the GTM Research Reserve's education and stewardship program.	N	R	0.075	\$500	2
3. Obtain summary reports, and if feasible raw data, from all past fisheries monitoring efforts at the GTM Research Reserve.	N	NR	0.12	\$500	4

Resource Management Strategies:

1. Encourage enforcement of up-to-date fishing regulations by increased patrols of ranger and law enforcement staff.	I	R	0.075	\$500	1
2. Obtain and maintain records of catch statistics of commercial species caught at the dam.	N	R	0.075	\$250	3

Education and Outreach Strategies:

1. Conduct a workshop on the status and trends of local recreational and commercially important fisheries.	N	R	0.09	\$2,500	3
2. Promote catch and release recreational fishing experiences.	N	R	0.01	\$250	4

Performance Measures:

1. Track long-term changes in catch rates, size, and biomass by species.	N	R	0.075	\$250	3
2. Initiation of monitoring programs.	N	NR	0.075	\$250	4
3. Species and water quality below and above the dam are not significantly different or altered by spillway management.	N	R	0.075	\$500	3

Objective Nineteen: Increase activities to explain the GTM Research Reserve's mission to the general public and to pursue partnerships with the offshore recreational and commercial fishing community to ensure the GTM Research Reserve's mission is understood and appreciated.

Ecosystem Science Strategies:

1. Facilitate research to map seafloor habitats.	N	NR	0.12	\$45,000	4
2. Facilitate right whale research projects.	N	R	0.03	\$15,000	1
3. Facilitate underwater archaeological surveys.	I	NR	0.09	\$45,000	4

Habitat and Species Management

Goal: Improve the conservation of natural biodiversity by implementing the principles of adaptive management and ecosystem science.

Objectives/Strategies/Performance Measures	Status	Type	Est. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
4. Summarize research, surveys, and monitoring results for integration into the GTM Research Reserve's education and stewardship program.	N	R	0.015	\$250	2
Resource Management Strategies:					
1. Confirm the GTM Research Reserve boundaries are accurately depicted on offshore navigational charts.	N	NR	0.015	\$500	3
2. Increase the GTM Research Reserve's staff presence within the GTM Research Reserve's oceanic habitats.	N	R	0.075	\$3,500	3
3. Obtain and maintain records of catch statistics of commercial species caught within the GTM Research Reserves oceanic habitat for use in the GTM Research Reserve's education and research program.	N	R	0.075	\$500	4
4. Provide GIS support for ocean mapping projects.	N	R	0.12	\$2,000	2
5. Work cooperatively with FWC to report encroachment by shrimp boats within legal state limit offshore.	N	R	0.015	\$500	3
Education and Outreach Strategies:					
1. Increase the GTM Research Reserve's involvement with the Clean Boater Program and Clean Marina partnership program.	I	R	0.09	\$2,500	1
2. Increase the GTM Research Reserve's staff presence at offshore fishing tournaments, boat shows and similar events.	I	R	0.09	\$3,000	1
3. Interpret the GTM Research Reserve's oceanic habitat and fisheries resources through displays, fact-sheets, posters, K-12 programming, and public outreach activities.	N	R	0.09	\$15,000	4
4. Incorporate Ocean Literacy Standards into education programs.	N	R	0.075	\$2,000	2
Performance Measures:					
1. The location and boundaries of the GTM Research Reserve are labeled correctly on navigation charts (including GPS charts).	N	NR	0.015	\$250	4
2. Trends in attendance at GTM Research Reserve hosted functions targeting coastal ocean audiences and contact hours for the GTM Research Reserve staff and volunteers at boat shows and fishing tournaments.	N	R	0.015	\$250	3
3. Oceanic resources are quantified and mapped.	N	R	0.015	\$250	3
Objective Twenty: Achieve measurable progress towards integrating the GTM Research Reserve's education, research, and stewardship program to more effectively reduce hazards associated with past fire suppression, maintain natural fire ecology of pyrogenic habitats and to use fire as a tool to restore the natural succession of rare habitats or to support listed species recovery efforts.					
Ecosystem Science Strategies:					
1. Conduct systematic monitoring of species composition (plants and animals) within experimental plots with an emphasis on the effects of fire on listed species and overall biodiversity.	I	R	0.075	\$10,000	1
2. Conduct and facilitate research to evaluate methods of restoring the natural biodiversity and microclimate of coastal strand habitat.	I	R	0.015	\$45,000	1
3. Summarize research results for integration into the GTM Research Reserve's education and stewardship program.	N	R	0.015	\$250	2
4. Repeat the gopher tortoise burrow census and conduct change analyses to document the distribution and trends in this keystone species.	I	R	0.09	\$2,000	1
Resource Management Strategies:					
1. Establish plots within pyrogenic habitats to serve as long-term research sites.	I	R	0.075	\$2,000	1
2. Establish mechanical removal versus fire treatment plots within the GTM Research Reserve coastal strand habitat.	N	NR	0.075	\$2,000	3
3. Conduct other activities as indicated in the GTM Research Reserve's prescribed fire plan.	I	R	0.12	\$45,000	1

Habitat and Species Management

Goal: Improve the conservation of natural biodiversity by implementing the principles of adaptive management and ecosystem science.

Objectives/Strategies/Performance Measures	Status	Type	Est. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
4. Maintain and procure adequate and reliable equipment and ensure staff is adequately trained to implement the GTM Research Reserve's prescribed fire program.	I	R	0.03	\$25,000	1
5. Pursue continuing staff training on current DEP standards for prescribe fire implementation	I	R	0.03	\$2,500	1
Education and Outreach Strategies:					
1. Interpret the GTM Research Reserve's prescribe fire program through displays, fact-sheets, posters, K-12 programming (Fire in Florida's Ecosystem), and public outreach activities.	I	R	0.015	\$300	1
2. Deliver fire ecology programming to communities in high fire hazard areas adjacent to the GTM Research Reserve.	I	R	0.03	\$1,000	1
Performance Measures:					
1. Acres of fire hazard reduced.	N	R	0.015	\$250	3
2. Acres of habitats restored.	N	R	0.015	\$250	3
3. Acres of habitats sustained in a prescribed successional rotation.	N	R	0.015	\$250	2
4. Sustained natural biodiversity and enhanced listed species abundance.	N	R	0.06	\$500	3
Objective Twenty-One: Achieve integration of the GTM Research Reserve's education, research, and stewardship program to more effectively control and, if possible, to eradicate Exotic Pest Plant Control Council (EPPC) category I and category II invasive exotic species within CAMA managed lands.					
Ecosystem Science Strategies:					
1. Monitor changes in natural biodiversity in sensitive habitats.	N	R	0.075	\$20,000	3
2. Monitor for new and established exotic species.	I	R	0.075	\$15,000	1
3. Summarize ecosystem science strategy results for integration into the GTM Research Reserve's education and stewardship program.	N	R	0.015	\$250	2
Resource Management Strategies:					
1. Proactively respond to new exotic species invasions.	I	R	0.075	\$10,000	1
2. Control existing invasive species consistent with state and federal protocol to minimize non-target damage.	I	R	0.075	\$15,000	1
3. Build and maintain an exotic species GIS database.	N	NR	0.09	\$500	3
Education and Outreach Strategies:					
1. Interpret the GTM Research Reserve's invasive species control program through displays, fact-sheets, posters, K-12 programming, and public outreach activities.	N	R	0.015	\$250	2
2. Deliver invasive species ecology programming to communities adjacent to the GTM Research Reserve and encourage native landscaping.	N	R	0.015	\$250	3
3. Facilitate and support Florida Friendly Yards and native plant landscaping programs and surrounding watershed communities.	I	R	0.075	\$10,000	1
Performance Measures:					
1. Area or number of non-native species removed.	N	R	0.015	\$250	2
2. Decreasing trend of ecological impact from non-native species as measured by loss of sentinel native species.	N	R	0.015	\$250	3
3. The GTM Research Reserve's CAMA managed habitats have fewer invasive species than adjacent unmanaged landscapes.	N	R	0.03	\$500	2
Objective Twenty-Two: Reduce illegal dune crossovers and substantially restore impacted dune vegetation by limiting beach access to authorized dune crossovers and by restoring dunes damaged by unauthorized access.					
Ecosystem Science Strategies:					
1. Establish photo points to document unauthorized dune crossovers and to assess the success of dune restoration projects.	N	NR	0.075	\$5,000	3
2. Summarize research results for integration into the GTM Research Reserve's stewardship and education program.	N	NR	0.015	\$250	3

Habitat and Species Management

Goal: Improve the conservation of natural biodiversity by implementing the principles of adaptive management and ecosystem science.

Objectives/Strategies/Performance Measures	Status	Type	Est. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
Resource Management Strategies:					
1. Increase staff and law enforcement patrols along State Road (SR) A1A.	N	R	0.3	\$2,000	2
2. Fence, re-vegetate, and irrigate all unauthorized dune crossovers until restored to a natural or stable condition.	I	NR	0.12	\$3,500	1
3. Provide GIS support for dune restoration and monitoring projects.	N	NR	0.03	\$500	3
Education and Outreach Strategies:					
1. Interpret the GTM Research Reserve dune habitat restoration program through displays, fact-sheets, posters, K-12 programming, and public outreach activities.	N	R	0.09	\$10,000	3
2. Deliver dune ecology programming to communities adjacent to the GTM Research Reserve and users of the beach.	I	R	0.075	\$2,000	2
Performance Measures:					
1. Reducing trends in unauthorized dune crossovers as measured by systematic photo point monitoring.	N	R	0.015	\$250	3
2. Numbers of crossovers restored in dune habitats.	N	NR	0.015	\$250	3
Objective Twenty-Three: Restore natural hydrologic cycle and fire ecology to the GTM Research Reserve's depression marsh habitats within the CAMA managed area.					
Ecosystem Science Strategies:					
1. Monitor and prepare reports concerning the hydrology of the restored freshwater depression marsh habitat.	I	R	0.09	\$15,000	1
2. Monitor and prepare reports relating to biodiversity of the restored freshwater depression marsh habitat.	I	R	0.09	\$15,000	2
3. Summarize research results for integration into the GTM Research Reserve's education and stewardship program.	N	R	0.015	\$500	3
Resource Management Strategies:					
1. Use prescribed fire and vegetation removal to restore depression marsh habitats.	I	R	0.12	\$5,000	1
2. In cooperation with FWC, fill ditches and restore hydrologic connectivity of the GTM Research Reserve's freshwater marsh system.	I	NR	0.12	\$65,000	1
3. In cooperation with the Anastasia Mosquito Control District, ensure wildlife compatible methods of mosquito control are incorporated into the restoration plan.	I	NR	0.075	\$15,000	3
4. If feasible, reintroduce striped newts and other compatible species to the restored depression marsh habitat in accordance with approved species recovery plans.	N	NR	0.075	\$10,000	5
Education and Outreach Strategies:					
1. Interpret the GTM Research Reserve's depression marsh restoration program through displays, fact-sheets, posters, K-12 programming, and public outreach activities to highlight the GTM Research Reserve's resource management efforts.	N	R	0.075	\$10,000	2
2. Deliver depression marsh ecology and restoration education programs to communities adjacent to the GTM Research Reserve and users of the trail system to promote community restoration and stewardship projects.	N	R	0.075	\$500	3
Performance Measures:					
1. Results of hydrologic and biological monitoring indicate restoration goals were met.	N	NR	0.015	\$250	3
2. Acres of depression marsh habitat restored.	N	NR	0.015	\$250	1
Objective Twenty-Four: Reduce disturbance of sea turtle and least tern nesting habitats by human activities.					
Ecosystem Science Strategies:					
1. Conduct or facilitate research to establish protocols for evaluating disturbance.	N	NR	0.075	\$75,000	3

Habitat and Species Management

Goal: Improve the conservation of natural biodiversity by implementing the principles of adaptive management and ecosystem science.

Objectives/Strategies/Performance Measures	Status	Type	Est. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
2. Establish baseline conditions for this evaluation protocol.	I	NR	0.075	\$25,000	3
3. Continued sea turtle and least tern monitoring of CAMA managed beaches.	I	R	0.12	\$5,500	1
4. Summarize research results for integration into the GTM Research Reserve's education and stewardship program.	N	R	0.015	\$500	3
Resource Management Strategies:					
1. Install walkover and parking lot signage.	I	NR	0.03	\$5,000	2
2. Develop a GIS database that identifies sea turtle and least tern nesting sites.	I	R	0.015	\$2,500	1
3. Install updated beach parking lot kiosks that alert beach goers to the current status of nesting turtles and birds.	N	R	0.09	\$15,000	3
4. Train volunteers to assist with field monitoring programs and to serve as beach ranger courtesy officers.	N	R	0.03	\$2,000	3
Education and Outreach Strategies:					
1. Interpret beach ecology through displays, fact-sheets, posters, K-12 programming, and public outreach activities.	N	R	0.03	\$500	2
2. Initiate beach nature walks on weekends during peak tourist seasons.	N	R	0.3	\$2,000	3
3. In cooperation with local property managers and owners, continue to develop and distribute new owner and tenant beach stewardship packets.	N	R	0.06	\$2,500	4
4. Design up-to-date seasonal beach and parking lot educational kiosks.	N	R	0.12	\$15,000	2
5. Recruit volunteers to assist with field monitoring programs.	I	R	0.075	\$2,500	1
Performance Measures:					
1. Increasing trends in the success of nesting sea turtle and least tern populations.	N	R	0.015	\$250	3
2. Decreasing trends in the observations of incidents of nest site disturbance by humans.	N	R	0.015	\$250	3
Objective Twenty-Five: Reduced wildlife impacts due to artificial lighting to non-detectable levels.					
Ecosystem Science Strategies:					
1. Summarize research information regarding hatchling disorientation and beach lighting for integration into the GTM Research Reserve's stewardship and education program.	N	R	0.015	\$250	4
Resource Management Strategies:					
1. Support and facilitate local community based beach lighting patrol programs for the beaches directly managed by CAMA.	N	R	0.075	\$2,500	4
Education and Outreach Strategies:					
1. Provide USFWS light switch stickers and other information in new home owner/ renter welcome packets.	N	N	0.03	\$2,500	4
Performance Measures:					
1. Reducing trends in beach lighting violations.	N	R	0.015	\$250	5
2. Reducing trends in hatchling disorientation due to artificial light.	N	R	0.015	\$250	4
Objective Twenty-Six: Serve as a clearinghouse of information concerning beach processes to guide decisions affecting local beach renourishment, inlet management, and stabilization projects.					
Ecosystem Science Strategies:					
1. Summarize existing research information regarding coastal processes, inlet management and beach erosion from the GTM Research Reserve affiliated workshops for integration into the GTM Research Reserve's education and stewardship program.	I	NR	0.06	\$500	1
2. Facilitate research to analyze beach profile data from the DEP Bureau of Beaches and Coastal Systems to determine erosion rates and long-term effects of sea level rise.	N	NR	0.09	\$100,000	3
3. Facilitate research to conduct finer time-scale profile measurements of the GTM Research Reserve beaches.	N	NR	0.06	\$250,000	4

Habitat and Species Management

Goal: Improve the conservation of natural biodiversity by implementing the principles of adaptive management and ecosystem science.

Objectives/Strategies/Performance Measures	Status	Type	Est. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
Resource Management Strategies:					
1. Report any unauthorized shoreline hardening or construction activities harming dune habitat to the appropriate regulatory agency.	I	R	0.075	\$250	1
Education and Outreach Strategies:					
1. Interpret beach processes through displays, fact-sheets, posters, K-12 programming, and public outreach activities.	I	R	0.03	\$250	2
2. Deliver a coastal processes and beach erosion workshop to communities adjacent to the GTM Research Reserve.	I	R	0.09	\$2,500	1
3. Establish a long-term beach profile database from the existing GTM Research Reserve education activities.	N	R	0.075	\$500	3
4. Deliver a Matanzas inlet workshop to highlight the rarity of the existence of a non-modified inlet and the dynamic processes that affect this unique inlet.	I	R	0.09	\$2,500	1
Performance Measures:					
1. Workshop attendance and CTP attendee survey.	I	R	0.015	\$250	1
2. Beach erosion response plans are based on the best available scientific information.	I	R	0.015	\$250	3
Totals			12.535	\$1,857,700	

Watershed

Goal: Reduce the impact of watershed land use on coastal resources by identifying priority pollutants and encouraging best management practices.

Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
Objective Twenty-Seven: Facilitate the development of watershed management plans for the GTM Research Reserve's watersheds that use conservation strategies focused on sustainable ecosystems.					
Ecosystem Science Strategies:					
1. Facilitate or conduct research that identifies watershed flow-ways and adequate buffers that protect water quality, link wildlife corridors and greenways, and promote sustainable land use practices.	N	NR	0.12	\$100,000	2
2. Ensure the GTM Research Reserve's monitoring dataset is used by local, regional and State agencies to identify short-term variability and long-term trends in nutrient concentrations, dissolved oxygen, salinity and as an index of eutrophication.	N	R	0.06	\$1,000	2
3. Summarize scientific information from the GTM Research Reserve and partner affiliated activities and research projects for integration into the GTM Research Reserve's education and stewardship program.	N	R	0.06	\$250	2
Resource Management Strategies:					
1. Provide GIS support for education and training programming targeting coastal decision makers to encourage best management practices for the GTM Research Reserve's watershed as requested.	N	R	0.15	\$1,000	3
2. Serve as a demonstration site and a clearinghouse for new technologies and methods that reduce pesticide and fertilizer use, conserve water, encourage renewable energy technologies and promote native landscaping.	N	NR	0.15	\$25,000	1
3. Partner with St. Johns County and Flagler County to place signs along highways to identify the boundary of the GTM Research Reserve watershed and to increase public awareness of the connection between landscape and estuary.	N	NR	0.09	\$15,000	1
4. Partner with St. Johns County, Flagler County and the SJRWMD to map flow-ways and storm water runoff entry points into the estuary.	N	NR	0.15	\$75,000	2

Watershed

Goal: Reduce the impact of watershed land use on coastal resources by identifying priority pollutants and encouraging best management practices.

Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
5. Encourage watershed-scale ecosystem management principles are included in the City and County Comprehensive Planning process.	N	R	0.375	\$7,000	3
6. Support and encourage land acquisition and less than fee simple conservation programs to encourage science-based sustainable land use concepts in GTM Research Reserve's watershed.	I	R	0.375	\$7,000	1
Education and Outreach Strategies:					
1. Deliver a series of workshops focused on proactive watershed-scale conservation and development planning to integrate planning and research efforts by the SJRWMD, DEP, county planners, city planners, universities, major landowners, and concerned citizens.	N	R	0.12	\$1,000	4
2. Incorporate the results of these watershed workshops into the GTM Research Reserve's fact-sheets, posters, K-12 programming, and public outreach activities.	N	R	0.06	\$500	4
3. Explore, and if feasible, implement NEMO initiatives for the communities in the GTM Research Reserve's watershed.	N	R	0.495	\$9,000	2
4. Deliver periodic workshops on green building techniques, green lodging, green marina, renewable energy technologies and other State sponsored programs supporting sustainable land use practices.	I	R	0.09	\$1,000	1
5. Host a workshop to highlight case studies of less than fee simple land acquisition projects including mitigation banking and conservation easements.	N	R	0.06	\$500	3
Performance Measures:					
1. Positive changes in watershed land use patterns (i.e., Flow-ways and wildlife corridors are identified and conserved).	N	R	0.495	\$3,000	5
2. Ecosystem-science-based watershed management Is included in City and County Comprehensive Plans.	N	R	0.495	\$250	5
3. The GTM Research Reserve's monitoring dataset is used by local, regional and State agencies to identify short-term variability and long-term trends in nutrient concentrations, dissolved oxygen, salinity and as an index of eutrophication.	N	R	0.015	\$250	2
Objective Twenty-Eight: Proactively improve the environmental awareness and stewardship practices of residents of the Town of Nocatee so it may serve as a model of a sustainable coastal community.					
Ecosystem Science Strategies:					
1. In cooperation with the Hastings Facility for Sustainability, conduct or facilitate research to examine technologies and landscaping alternatives to reduce nonpoint source pollutant runoff.	N	NR	0.06	\$100,000	3
2. Summarize scientific information from the GTM Research Reserve affiliated workshops and facilitated research projects for integration into the GTM Research Reserve's education and stewardship program.	N	R	0.03	\$500	3
Resource Management Strategies:					
1. Apply and demonstrate environmentally compatible landscaping practices at the EEC and if feasible, within the town of Nocatee.	N		0.15	\$1,500	1
2. Provide feedback and recommendations for the management of the Nocatee preserve.	N		0.09	\$500	1
Education and Outreach Strategies:					
1. Facilitate and integrate Florida Native Plant Society and Florida Yards and Neighborhoods (FYN) concepts into the GTM Research Reserve's EEC and educational programming.	I	R	0.15	\$10,000	2

Watershed

Goal: Reduce the impact of watershed land use on coastal resources by identifying priority pollutants and encouraging best management practices.

Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
2. Deliver a “sustainable living” workshop to Nocatee residents and developers.	N	R	0.09	\$3,000	2
3. Develop teaching modules catered to Nocatee residents’ issues and needs as a model for other communities in Northeast Florida.	I	NR	0.24	\$4,000	2
4. Export lessons learned in sustainable living to other communities.	N	R	0.09	\$500	3
5. In partnership with the University of Florida Extension program develop a Green-Household and Landscaper Training Certificate Program.	N	R	1.5	\$25,000	5
Performance Measures:					
1. Trends in FYN certified yards established or Green-Household Certificates awarded in the Town of Nocatee.	N	R	0.09	\$250	3
2. Trends in research projects conducted or facilitated with a nonpoint source pollutant reduction focus.	N	R	0.06	\$250	2
3. Trends in water-use, fertilizer applied and electricity use in Nocatee.	N	R	0.09	\$250	3
Objective Twenty-Nine: Increase the GTM Research Reserve education, stewardship and research programming within its southern component.					
Ecosystem Science Strategies:					
1. Explore, and if feasible, coordinate a volunteer water quality monitoring program for Pellicer Creek linked to the GTM Research Reserve’s SWMP activities.	N	R	0.15	\$35,000	3
2. Summarize information from the GTM Research Reserve’s southern component affiliated volunteer and SWMP monitoring projects for integration into the the GTM Research Reserve’s education and stewardship program.	N	R	0.03	\$250	3
Resource Management Strategies:					
1. Increase staff presence and stewardship activities in the GTM Research Reserve’s southern component.	N	R	0.15	\$10,000	3
Education and Outreach Strategies:					
1. Increase efforts to interpret coastal habitats through displays, fact-sheets, posters, K-12 programming, and public outreach activities in the southern component of the GTM Research Reserve.	N	R	0.75	\$10,000	2
2. Plan workshops using facilities located in Marineland.	I	R			1
3. Increase Friends of the Reserve’s presence and activities at the south office.	N	R	0.15	\$2,000	2
Performance Measures:					
1. The number of educational programs completed in the southern component of the GTM Research Reserve.	N	R	0.015	\$200	1
2. The number of workshops delivered at the Marineland facility and surrounding area.	I	R	0.015	\$200	1
3. The number of research projects initiated in the southern component of the GTM Research Reserve.	N	R	0.015	\$200	3
4. The number of stewardship activities accomplished in the southern component of the GTM Research Reserve.	N	R	0.015	\$200	4
Total			7.29	\$450,550	

Cultural Resources

Goal: Enhance understanding, interpretation, and preservation of the GTM Research Reserve's cultural resources.

Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
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I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring

Objective Thirty: Complete Phase I and Phase II archaeological surveys of CAMA managed lands on the Guana Peninsula.

Ecosystem Science Strategies:

1. Summarize research information regarding cultural resources for integration into the GTM Research Reserve's education and stewardship programs.	N	R	0.06	\$250	3
2. Working with partners, pursue grant funding to refine information on known archaeological sites and identify prehistoric settlement patterns.	N	NR	0.3	\$500	3

Resource Management Strategies:

1. Complete Florida Master Site File forms for all known but unrecorded sites.	I	R	0.12	\$250	1
2. Plan and initiate a program of professionally conducted cultural landscape studies throughout CAMA managed uplands incorporating Phase I and if feasible, Phase II archaeological surveys.	N	R	0.15	\$150,000	3
3. Provide GIS support for archaeological surveys.	I	R	0.06	\$2,000	1

Education and Outreach Strategies:

1. Interpret the results of archaeological surveys through displays, fact-sheets, posters, K-12 programming, and public outreach activities.	N	R	0.12	\$15,000	5
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Performance Measures:

1. Number of cultural sites surveyed using Phase I criteria.	N	NR	0.015	\$200	4
2. Number of cultural sites surveyed using Phase II criteria.	N	NR	0.015	\$200	5
3. Initiation of a Cultural Landscape Study for CAMA managed lands on the Guana Peninsula.	N	NR	0.015	\$200	5
4. Number of new sites recorded.	N	NR	0.015	\$200	5
5. Percent of the Guana Peninsula surveyed using Phase I Criteria.	N	NR	0.03	\$200	5

Objective Thirty-One: Develop the first complete scope of collections for all artifacts collected from CAMA managed lands within the GTM Research Reserve.

Ecosystem Science Strategies:

1. Identify the location, condition and obtain a digital photo and description of all artifacts previously collected by archaeologists.	I	NR	0.06	\$2,500	1
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Resource Management Strategies:

1. Assemble a "scope of collections" statement, including a catalog and inventory of all permanent collections held at the GTM Research Reserve or elsewhere.	I	NR	0.12	\$500	2
2. Provide GIS support for these archaeological inventories.	I	R	0.01	\$250	1

Education and Outreach Strategies:

1. Interpret information, photos and collected artifacts through displays, fact-sheets, posters, K-12 programming, and public outreach activities.	N	NR	0.03	\$2,000	5
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Performance Measures:

1. Completion of the "scope of collections".	N	NR	0.015	\$250	2
2. The number of artifacts cataloged.	N	NR	0.015	\$250	2

Objective Thirty-Two: Enhance opportunities for the public to experience the significance of the cultural resources on CAMA managed lands within the GTM Research Reserve.

Ecosystem Science Strategies:

1. Summarize information regarding cultural resources for integration into the GTM Research Reserve's education and stewardship programs.	I	NR	0.06	\$500	1
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Resource Management Strategies:

1. Install adaptable interpretive kiosks to provide up-to-date information on cultural resources for visitors to the GTM Research Reserve.	I	NR	0.12	\$10,000	1
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Cultural Resources

Goal: Enhance understanding, interpretation, and preservation of the GTM Research Reserve's cultural resources.

Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
2. Work cooperatively with the Lighthouse Archaeological Maritime Program (LAMP) and other partners to explore and, if feasible, establish a Florida National Maritime Heritage Designation for the GTM Research Reserve and surrounding area.	I	NR	.01	\$500	1
Education and Outreach Strategies:					
1. Seek training for staff and volunteers in cultural resource interpretation.	N	R	0.03	\$3,000	1
2. Host Archaeology Symposia at the GTM Research Reserve.	I	R	0.06	\$1,000	1
3. Develop a program involving docents to provide cultural resource information to trail users and EEC visitors.	N	R	0.06	\$300	4
4. Develop kiosks, fact sheets and brochures to interpret specific cultural artifacts and resource sites such as Shell Bluff, Wright's Landing, Sanchez Mound and other significant sites or artifacts.	N	R	0.09	\$10,000	3
5. Include information on cultural resources and history in the GTM Research Reserve K-12 and adult education programming.	N	R	0.03	\$250	5
Performance Measures:					
1. Trends in user satisfaction survey responses regarding cultural resource interpretation on visitor use surveys.	N	R	0.03	\$1,000	3
2. Increased partnerships with cultural resource based organizations, educators and scientists.	I	R	0.015	\$300	1
3. Trends in educational opportunities involving the GTM Research Reserve's archaeological resources including media coverage and the number of new kiosks, fact sheets, displays and brochures.	N	R	0.03	\$250	5
Objective Thirty-Three: Develop an effective approach to maintain and conserve known archaeological sites and their associated artifact assemblage from vandalism, erosion and other forms of degradation.					
Ecosystem Science Strategies:					
1. Monitor the condition of sites through the use of photo points.	N	R	0.15	\$1,000	3
2. Summarize information from surveys and photo points for integration into the GTM Research Reserve's education and stewardship programs.	N	R	0.03	\$250	3
Resource Management Strategies:					
1. Regularly assess the condition of recorded and unrecorded cultural resources.	I	R	0.15	\$1,000	1
2. Document vandalism and hog disturbance.	N	R	0.15	\$250	2
3. Discourage vandalism and hog disturbance through fencing and other means as deemed necessary.	I	R	0.09	\$5,000	1
4. Seek professional archaeological assessments to document and determine feasibility of relocation, re-creation and repair of historic structures.	I	NR	0.12	\$100,000	1
5. Work cooperatively with the FIND and other partners to explore, and if feasible, preserve and interpret historical maritime settlements threatened by coastal erosion.	N	NR	0.12	\$180,000	3
Education and Outreach Strategies:					
1. Develop kiosks, fact sheets and brochures to interpret repair, relocation, re-creation and rehabilitation of historic structures of cultural sites threatened by coastal erosion.	N	R	0.06	\$10,000	4
Performance Measures:					
1. Trends in visible damage through time as documented by photo points.	N	R	0.03	\$250	3
2. Historic structures and artifacts are preserved, relocated, re-created or repaired.	N	R	0.015	\$250	2
TOTAL			2.6	\$499,850	

Global Processes

Goal: Serve as a clearinghouse of information concerning global and meteorological processes and as a demonstration site for green building technologies and practices.

Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
Objective Thirty-Four: Retrofit the GTM Research Reserve's EEC facilities to serve as a demonstration site for green technologies and to reduce its reliance on nonrenewable energy.					
Ecosystem Science Strategies:					
1. Collect and summarize data regarding energy and cost savings associated with various retrofits and integrate this information into the education and stewardship program.	I	NR	0.30	\$500	1
Resource Management Strategies:					
1. Develop an Environmental Systems Management Plan for the GTM Research Reserve's facilities and vehicles.	N	R	0.09	\$200	4
2. Maintain on-site demonstration displays for FYN landscapes and renewable energy technologies, such as reducing the use of maintenance intensive sod for landscaping and replacing the areas of sod with native ground cover.	I	R	0.15	\$2,000	1
Education and Outreach Strategies:					
1. Develop fact sheets and brochures to interpret EEC improvements (water conservation, energy demand and recycling).	N	R	0.06	\$1,500	4
2. Conduct a workshop addressing green building retrofitting technologies.	N	R	0.03	\$500	2
3. Develop on-site demonstration displays for FYN landscapes, green technologies, sustainable living, and best management practices (BMP's).	N	R	0.06	\$100	4
4. Develop a volunteer based committee to take ownership of landscaping and building technologies to implement portions of the Environmental Management System plan for the EEC (i.e., reduce areas to be mowed, decrease impervious surfaces, better manage landscape vegetation, research and recommend alternative energy sources, reduce energy consumption, and increase recycling).	N	R	0.06	\$250	3
Performance Measures:					
1. Trends in the GTM Research Reserve's water and fuel consumption, electricity used, and recycling program.	N	R	0.02	\$200	3
2. Trends in public requests for green building and renewable energy information.	N	R	0.01	\$200	3
Objective Thirty-Five: Disseminate up-to-date scientific information regarding climate change and sea level rise.					
Ecosystem Science Strategies:					
1. Partner with United States Geological Survey researchers to establish Sediment Elevation Table monitoring within the GTM Research Reserve.	N	R	0.12	\$20,000	2
2. Facilitate or conduct species range expansion monitoring including invasive species.	N	R	0.15	\$1,000	4
3. Partner with NOAA on sea level rise projects for access to the most current data sets and projections.	N	R	0.15	\$200	4
4. Summarize information from the GTM Research Reserve's workshops and monitoring programs for integration into the GTM Research Reserve's education and stewardship programs.	N	R	0.03	\$200	2
5. Facilitate or conduct monitoring of long-term sentinel emergent marsh habitats associated with the GTM Research Reserve's SWMP activities.	N	R	0.12	\$20,000	2

Global Processes

Goal: Serve as a clearinghouse of information concerning global and meteorological processes and as a demonstration site for green building technologies and practices.

Objectives/Strategies/Performance Measures	Status	Type	Esti. FTE	Cost Estimate	Plan Year Initiated
<i>I=Initiated, N=Not Initiated, R=Recurring, NR=Not Recurring</i>					
Resource Management Strategies:					
1. Based on the current state of knowledge of sea level rise, assess potential natural and cultural resource losses and begin a long-term planning process.	N	R	0.06	\$500	4
2. Provide GIS support to educational and research climate change and sea level rise initiatives.	N	R	0.15	\$5,000	4
3. Work cooperatively with local and regional partners to develop and implement restoration or acquisition plans to respond to marsh habitat migration scenarios associated with predicted sea level rise.	N	R	0.12	\$100,000	5
Education and Outreach Strategies:					
1. Develop fact sheets and brochures to interpret the fate of specific cultural and natural resources based on the best available information on global climate change and sea level rise.	N	R	0.06	\$1,500	4
2. Include research results for the GTM Research Reserve's sediment elevation tables into the GTM Research Reserve's educational programming.	N	R	0.02	\$250	5
3. Conduct workshops addressing climate change and sea level rise for the local community and Northeast Florida region.	I	R	0.03	\$250	2
Performance Measures:					
1. Trends in requests for the GTM Research Reserve to provide information regarding sea level rise and climate change.	N	R	0.03	\$250	3
2. Trends in sea level rise and climate change research projects initiated.	N	R	0.03	\$250	2
3. Trends in long-term planning for habitat migration and cultural resources preservation.	N	R	0.03	\$250	2
TOTAL			1.87	\$155,100	

A.12 / Analysis of Contracting Potential

Table 11 / Potential for outsourcing of services.

Potential Contracting for Activities on GTM Research Reserve			
Activity	Approved	Conditional	Rejected
Prescribed burning		X	
Minor fire line installation		X	
Fire line, fence, and trail maintenance		X	
Fence installation	X		
Roller chopping	X		
Organism inventory and monitoring		X	
Listed species mapping and needs assessment		X	
Restore/enhance encroachment and ruderal areas		X	
Determine extent of hydrologic needs of buffer preserve	X		
Restore hydrology via fill and excavation	X		
Reduce exotic species		X	
Education facilities, programs, and literature development and printing		X	
Education signs development and installation		X	
Trail and boardwalk installation	X		
Law enforcement and patrol	X		
Timber harvesting		X	

A.13 / Land Management Review Team Recommendations and Management Response

Land management review teams were established by Section 259.036, Florida Statutes, to evaluate management of conservation, preservation, and recreation lands titled in the name of the Board of Trustees of the Internal Improvement Trust Fund. The teams determine whether the lands are being managed for the purposes for which they were acquired and in accordance with a land management plan adopted pursuant to s. 259.032 by the Board of Trustees, acting through the Department of Environmental Protection. The managing agency is to consider the findings and recommendations of the land management review team in finalizing the required update of its management plan.

A land management review was conducted for Guana River State Park on December 10, 2003, prior to the management lease being transferred from DEP's Division of Recreation and Parks to the Office of Coastal and Aquatic Managed Areas. The land formerly known as Guana River State Park is the only upland section of GTM Research Reserve owned by the Board of Trustees of the Internal Improvement Trust Fund and subject to reviews by the Land Management Review Team. Recommendations and findings from the Guana River State Park 2003 review were considered and, where appropriate, incorporated into this GTM Research Reserve plan update.

The 2003 Land Management Review Team had two recommendations for the manager: 1) terminate the Boy Scout Use Agreement because of the sensitivity of the resources at the site and other management reasons, and 2) work to eliminate conflicting vehicle/pedestrian use on the joint FWC entrance road/DRP hiking trail, during hunting season. In light of the fact that no record exists to date of the use of this property by the Boy Scouts of America (BSA) for activities authorized by this Use Agreement, no impacts to resources have occurred; and considering that the GTM Research Reserve has cultivated mutually beneficial relationships with local BSA troops through community service and Eagle Scout merit projects that support the Research Reserve's mission, the Research Reserve feels that this action should be deferred for the current time. Regarding the entrance, in 2005 CAMA recommended that the hunter access be relocated to the Roscoe Boulevard entrance. This recommendation was not accepted by FWC due to concerns about increased vehicular traffic through the residential area surrounding the Roscoe Boulevard entrance that hunter access there would create. Research Reserve staff has posted 15 mph speed limit signage along the shared portion of the trail and is actively working with DEP and FWC law enforcement to reduce the speed of hunter vehicles on this trail. Signage has also been posted to alert pedestrians to the presence of vehicles on this trail during hunting season.

**Land Management Review of
Guana River State Park
Lease No. 3462
December 10, 2003**

Prepared by Division of State Lands Staff

William Howell, OMC Manager
Joseph Duncan, Administrative Assistant

*For
Guana River State Park Review Team*

FINAL REPORT

March 10, 2004

Land Manager:	<u>DRP</u>
Area:	<u>2,398 acres</u>
County:	<u>St. Johns</u>
Mngt. Plan Revised:	<u>3/26/1999</u>
Mngt. Plan Update Due:	<u>3/26/2009</u>

Management Review Team Members

Agency Represented	Team member Appointed	Team member In attendance
Division of Forestry	Bill Korn	Bill Korn
DRP	Randall Hester	Randall Hester
FWCC	Mike Abbott	Mike Abbott
Private Land Manager	Billy Liphthrott	Billy Liphthrott
DEP	Jennifer Auger	
Conservation Org. (TNC)	Walt Thomson	Evan McCluney
County	Bruce Maguire	

Process for Implementing Regional Management Review Teams

Legislative Intent and Guidance:

Chapter 259.036, F. S. was enacted in 1997 to determine whether conservation, preservation, and recreation lands owned by the state Board of Trustees of the Internal Improvement Trust Fund (Board) are being managed properly. It directs the Department of Environmental Protection (DEP) to establish land management review teams to evaluate the extent to which the existing management plan provides sufficient protection to threatened or endangered species, unique or important natural or physical features, geological or hydrological functions, and archaeological features. The teams also evaluate the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices, including public access, are in compliance with the adopted management plan. If a land management plan has not been adopted, the review shall consider the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices are in compliance with the management policy statement and management prospectus for that property. If the land management review team determines that reviewed lands are not being managed for the purposes for which they were acquired or in compliance with the adopted land management plan, management policy statement, or management prospectus, DEP shall provide the review findings to the Board, and the managing agency must report to the Board its reasons for managing the lands as it has. A report of the review findings is given to the managing agency under review, the Acquisition and Restoration Council, and to the Division of State Lands. Also, DEP shall report the annual review findings of its land management review teams to the Board no later than the second board meeting in October of each year.

Review Site

The management review of Guana River State Park considered approximately 2,398 acres in St. Johns County that are managed by the Division of Recreation and Parks (DRP). The team evaluated the extent to which current management actions are sufficient, whether the land is being managed for the purpose for which it was acquired, and whether actual management practices, including public access, are in compliance with the management plan. The DRP management plan was approved on March 26, 1999, and the management plan update is due on March 26, 2009.

Review Team Determination

Is the land being managed for the purpose for which it was acquired?

After completing the checklist, team members were asked to answer “yes” or “no” to this question. All team members agreed that Guana River State Park is being managed for the purpose for which it was acquired.

Are actual management practices, including public access, in compliance with the management plan?

After completing the checklist, team members were asked to answer “yes” or “no” to this question. All team members agreed that actual management practices, including public access, were in compliance with the management plan for this site.

Exceptional Management Actions

The following items received high scores on the review team checklist (see attachment 1), which indicates that management actions exceeded expectations

Exceptional management actions:

- Management and protection of the Beach Dune, Coastal Strand, Shell Mound, Maritime Hammock, Depression Marsh, Estuarine Tidal Marsh.
- Protection and preservation of cultural sites.
- Excellent protection of animals and plants.
- Excellent restoration of ditches.
- Exceptional law enforcement presence.
- Exceptional effort to acquire inholdings/additions.
- Exceptional boundary surveys and gates/fencing.
- Exceptional roads, parking and recreational opportunities.
- Exceptional environmental education/outreach.
- Exceptional buildings, equipment, staff and waste disposal program.

Recommendations and Checklist Findings

The management plan must include responses to the recommendations and checklist items that are identified below.

Recommendations

The following recommendations resulted from a discussion and vote of review team members.

- 1. The team recommends that the DRP consider pursuing terminating the Use Agreement to the Boy Scouts because of the sensitivity of the resources, both natural and cultural, at this site, and for other management reasons. (VOTE: 5+, 0-)**

Manager's Response:

DRP: Agree. We will consider this and take action if determined to be a feasible course of action. However, it should be noted that the use agreement does not expire until 2013 and that it would be automatically be renewed for an additional 25 years if the North Florida Council is not in default on any terms of the agreement.

CAMA: Agree. Manager will consult with DEP Office of General Counsel to determine whether any action is advisable.

2. The team recommends that both managing agencies at this site work together to eliminate conflicting vehicle/pedestrian use on the joint FWC entrance road/DRP hiking trail, during the hunting seasons. (VOTE: 5+, 0-)

Manager's Response:

DRP: Agree.

CAMA: Agree. Discussions have begun, with the goal of agreeing on a plan of action prior to the opening of the new GTMNERR Environmental Education Center, the recreation area enhancements, and new entry fee station before the 2004 hunting season.

Checklist findings

The following items received low scores on the review team checklist (see Attachment 1), which indicates that management actions, in the field, were insufficient (f) or that the issue was not sufficiently addressed in the management plan (p). These items need to be further addressed in the management plan update.

1. Discussion in the management plan of burn frequency needs by community type (p).

Manager's Response:

DRP: Agree

CAMA: Agree

2. Discussion in the management plan of the need to monitor surface water quality and quantity (p).

Manager's Response:

DRP: Disagree. We do not see the need to conduct detailed water quality/quantity monitoring at this park – nor do we have the staff or funding to undertake such an effort. However, if the need arises to begin monitoring in a specific area for a specific reason, we will do so.

CAMA: Research and monitoring is an integral part of the CAMA and GTMNERR program and will greatly increase throughout the reserve. Specific actions in the Guana River Marsh Aquatic Preserve, Guana River, and Guana Lake are being discussed by GTMNERR in consultation with research partners.

3. Discussion in the management plan of the need for bathrooms at the beach parking lots (f).

Manager's response:

DRP: Disagree. It is beyond the scope of the review team's responsibilities to plan facilities or development on state lands.

CAMA: Disagree. Existing portable toilets meet the need. The provision of water supply, on-site sewage disposal system, buildings, additional maintenance, security, and public use impacts and financial costs are far beyond the scope of the review and the adverse impacts to the natural systems may be determined to be unacceptable by GTMNERR.

4. Discussion in the management plan of the need for more funding (f).

Manager's response:

DRP: Agree.

CAMA: Agree. Additional funds are much needed and can be put to very beneficial uses. The incorporation of this property directly within the GTMNERR program and the increased state support of the Aquatic Preserve Program should go a long way to addressing funding and staffing needs.

Team Member's Comments

Natural Communities: protection and maintenance: (I.A)

- Excellent work to eliminate dune walkover trails by more law enforcement and new boardwalk walkovers.
- Land management plan/community mapping needs updating. Suggest mapping of old growth pine.

Listed Species: protection and preservation: (I.B)

- Hog populations appear to be under control.
- Burn more frequently.
- Management plan needs to address population-monitoring trends for striped newts, delete gopher tortoise. Survey needs discussion.
- Good work monitoring sea turtles shore birds and St. Augustine beach mice.

Cultural Resources: (II.A; II.B)

- Good effort at identifying and protecting endangered cultural/archeological sites.

Prescribed Fire (Natural Community Maintenance): (III.A)

- No burn plan found in comprehensive management plan.
- Special efforts have been taken to prepare permanent firebreaks and burn in coastal strand. Continued effort is needed in depression marsh and flat woods to achieve desired community goals. Revise burn frequency for coastal strand.

Restoration of Disturbed Natural Communities: (III.B)

- Good job restoring back filling ditches in depression marsh.
- Excellent efforts to reduce illegal beach access through dunes.

Non-native Invasive and Problem Species: (III.D)

- Currently biologist shooting hogs as necessary. Problems with hogs did not appear significant in sites visited.

Hydrologic/Geologic Function: (III.E)

- There was not a reference to ground water or surface monitoring in the plan.
- There is a need to update plan with recent trends in coli form levels in Guana River.

Resource Protection: (III.F)

- Need to evaluate the benefit of resource protection signage along Tolomato River shoreline. There is also a need to address the policy towards public access along this same section of river.
- Address fence hole problems at WMA boundary.

Public Access and Education: (IV.H)

- More trail-based interpretations would be beneficial. Several nice kiosks do exist. Additional information on cultural heritage is recommended.

Management Resources: (V.2.; V.3; V.4)

- DEP needs to provide more funding for Guana River State Park.
- Bathrooms are needed at beach parking lots.
- Funding was inadequate.

Exceptional Management Actions:

- Swale and dune restoration.
- Good archeological protection. More may be needed.

Areas of Insufficient Management:

- There is a need for a more specific plan. A significant upgrade is needed and words like may, should or it's recommended should not be used.

Recommendations for Improving Management of this Site:

- Improve fire management program.
- Trap hogs and stop wasting hogs by shooting them and leaving them lay. Hogs should be removed from the property, but utilized for food. Consider contracting with a hog trapper. Potential PR problem.
- Identify increased opportunities for public interpretation of cultural/archeological sites.
- The management plan is vague and needs to be upgraded. The author spent too much time discussing what has been done in the past and not enough on what is proposed. There are numerous inaccuracies.

Attachment I

PLAN REVIEW		1	2	3	4	5	Average
Beach Dune	I.A.1	1	1	1	0	1	0.80
Coastal Strand	I.A.2	1	1	1	0	1	0.80
Mesic Flatwood	I.A.3	1	1	1	1	1	1.00
Scrub	I.A.4	1	1	0	0	1	0.60
Shell mound	I.A.5	1	1	1	1	1	1.00
Maritime hammock	I.A.6	1	1	0	0	1	0.60
Depression marsh	I.A.7	1	1	1	0	1	0.80
Estuarine Tidal Marsh	I.A.8	1	1	1	1	1	1.00
Animals	I.B.1	1	1	1	0	1	0.80
Plants	I.B.2	1	1	1		1	1.00
Survey	II.A	1	1	1	1	1	1.00
Protection and Preservation	II.B	1	1	1	1	1	1.00
Area Being Burned	III.A.1	1	1	1	1	1	1.00
Frequency	III.A.2	1	0	0	0	1	0.40
Quality	III.A.3	1	0	1	0	1	0.60
Depression marsh	III.B.1	1	1	1			1.00
Beach dune	III.B.2	1	1	1			1.00
Animals	III.D.1	1	1	1	1	1	1.00
Plants	III.D.2	1	1	1	0	1	0.80
Roads/Culverts	III.E.1a	1	0	1	0	1	0.60
Ditches	III.E.1b	1	1	1	1	1	1.00
Surface water quality	III.E.3a	1	0	0	0	1	0.40
Surface water quantity	III.E.3b	1	0	0	0	1	0.40
Boundary survey	III.F.1	1	1	1	1	1	1.00
Gates & fencing	III.F.2	1	1	1	1	1	1.00
Signage	III.F.3	1	1	1	0	1	0.80
Law enforcement presence	III.F.4	1	1	1	0	1	0.80
Expanding Development	III.G.1a	1	1	1	0	1	0.80
Inholdings/additions	III.G.2	1	1	1			1.00
Roads	IV.1a	1	0	1	1	1	0.80
Parking	IV.1b	1	1	1	1	1	1.00
Recreational opportunities	III.F.2	1	1	1	1	1	1.00
Interpretive facilities and signs	III.F.3	1	1		0	1	0.75
Environmental education/outreach	III.F.4	1	1			1	1.00
FIELD REVIEW		1	2	3	4	5	Average
Beach Dune	I.A.1	4	4	4	5	4	4.20
Coastal Strand	I.A.2	4	4	4	3	4	3.80
Mesic Flatwood	I.A.3	4	2	3	2	3	2.80
Scrub	I.A.4	4	3	3		3	3.25
Shell mound	I.A.5	4	3	4	4	4	3.80
Maritime hammock	I.A.6	4	4	4		4	4.00

Depression marsh	I.A.7	4	3	4	3	4	3.60
Estuarine Tidal Marsh	I.A.8	4	4	3	3	4	3.60
Animals	I.B.1	4	4	4	3	4	3.80
Plants	I.B.2	4	3	3		4	3.50
Survey	II.A	4	3	3	3	3	3.20
Protection and Preservation	II.B	4	4	4	5	4	4.20
Area Being Burned	III.A.1	2	2	3	3	3	2.60
Frequency	III.A.2	2	2	3		3	2.50
Quality	III.A.3	4	4	3		3	3.50
Depression marsh	III.B.1	5	4	4	3	4	4.00
Beach dune	III.B.2	5	4	5	5	5	4.80
Animals	III.D.1	4	4	3	4	4	3.80
Plants	III.D.2	4	3	3	4	4	3.60
Roads/Culverts	III.E.1a	4	4	3	4	4	3.80
Ditches	III.E.1b	4	4	4	4	4	4.00
Surface water quality	III.E.3a	4	3	3		3	3.25
Surface water quantity	III.E.3b	4	3	3		3	3.25
Boundary survey	III.F.1	4	4	3	5	4	4.00
Gates & fencing	III.F.2	4	4	4	4	4	4.00
Signage	III.F.3	4	4	3	3	3	3.40
Law enforcement presence	III.F.4	4	4	4	4	4	4.00
Expanding Development	III.G.1a	4	3	3	2	3	3.00
Inholdings/additions	III.G.2	4	4	3			3.67
Roads	IV.1a	4	4	3	4	3	3.60
Parking	IV.1b	4	3	4	4	3	3.60
Recreational opportunities	III.F.2	5	4	4	5	3	4.20
Interpretive facilities and signs	III.F.3	4	3	2		2	2.75
Environmental education/outreach	III.F.4	5	4	4	4	5	4.40
Waste disposal	V.1.a		3	3	4	4	3.50
Sanitary facilities	V.1.b		2	2	2	2	2.00
Buildings	V.2.a		4	3	3	4	3.50
Equipment	V.2.b		4	3	3	4	3.50
Staff	V.3		4	3	4	4	3.75
Funding	V.4		2	2	1	3	2.00

A.14 / Recorded Archaeological Sites

Northern Component

FMSF #	Site Name	Property Management	Description
SJ00003	WRIGHT'S LANDING	CAMA - GTMNERR	Prehistoric midden
SJ00004	SANCHEZ MOUND	CAMA - GTMNERR	Prehistoric burial mound
SJ00032	SHELL BLUFF LANDING	CAMA - GTMNERR	Homestead; Prehistoric midden
SJ00033	SOUTH OF WRIGHT'S LANDING	CAMA - GTMNERR	Prehistoric midden
SJ02547	NN	CAMA - GTMNERR	Prehistoric shell midden
SJ02548	LITTLE ORANGE	CAMA - GTMNERR	Prehistoric shell midden
SJ02549	NN	CAMA - GTMNERR	Prehistoric shell midden
SJ02550	GUANA 1	CAMA - GTMNERR	Habitation (prehistoric)
SJ02551	NN	CAMA - GTMNERR	Prehistoric shell midden
SJ02552	GUANA 6	CAMA - GTMNERR	Campsite (prehistoric)
SJ02553	NN	CAMA - GTMNERR	Prehistoric shell midden
SJ03145	MARSHALL CREEK MIDDEN NORTH	CAMA - GTMNERR	Habitation (prehistoric)
SJ03146	MARSHALL CREEK MIDDEN SOUTH	CAMA - GTMNERR	Habitation (prehistoric)
SJ03147	CREWS LANDING	CAMA - GTMNERR	Prehistoric shell midden
SJ03149	SHANNON ROAD MIDDEN	CAMA - GTMNERR	Prehistoric shell midden
SJ03150	GUANA RUINS	CAMA - GTMNERR	Building remains
SJ03151	GUANA SHELL MIDDEN	CAMA - GTMNERR	Prehistoric shell midden
SJ03175	AIRPORT MIDDEN 1	CAMA - GTMNERR	Prehistoric shell midden
SJ03185	CASA COLA MIDDEN	CAMA - GTMNERR	Prehistoric shell midden
SJ03187	SOMBRERO CREEK MIDDEN	CAMA - GTMNERR	Prehistoric shell midden
SJ03189	UNRECORDED SITE B	CAMA - GTMNERR	Prehistoric shell midden
SJ03205	GUANA NORTH	CAMA - GTMNERR	Campsite (prehistoric)
SJ03229	SOUTH PARKING LOT	CAMA - GTMNERR	Prehistoric midden
SJ03235	GUANA 2	CAMA - GTMNERR	Habitation (prehistoric)
SJ03236	GUANA 3	CAMA - GTMNERR	Campsite (prehistoric)
SJ03237	GUANA 4	CAMA - GTMNERR	Single artifact or isolated find
SJ03238	GUANA 7	CAMA - GTMNERR	Prehistoric shell midden
SJ03244	GUANA LAKE EAST	CAMA - GTMNERR	Campsite (prehistoric)
SJ03252	ON THE LINE	CAMA - GTMNERR	Building remains
SJ03286	BEACHSIDE SHELL MIDDEN	CAMA - GTMNERR	Campsite (prehistoric)
SJ03486	THREE MILE	CAMA - GTMNERR	Prehistoric shell midden
SJ04801	TOLOMATO BAR ANCHORAGE SITE	CAMA - GTMNERR	Anchorage midden-underwater
SJ04872	STOKES CREEK BARGES	CAMA - GTMNERR	Saltwater submerged site
SJ04988	VILANO BEACH RUDDER	CAMA - GTMNERR	Shipwreck artifact
SJ05322	EVENDEN-WILLIAMS	CAMA - GTMNERR	Prehistoric shell midden
SJ05353	ANCIENT SHIPWRECK ARTIFACT	CAMA - GTMNERR	Tidal-estuarine
SJ05398	DOUBLE H MOUND	CAMA - GTMNERR	Prehistoric shell midden
SJ05401	SHIPWRECK TIMBER	CAMA - GTMNERR	Shipwreck artifact
SJ05407	BLACK SOOT MIDDEN	CAMA - GTMNERR	Prehistoric shell midden
SJ00037	PALM VALLEY	FWC - Guana River Wildlife Mgt.	Prehistoric burial mound
SJ00038	JENKS LANDING	FWC - Guana River Wildlife Mgt.	Artifact scatter-low density (< 2per sq meter)
SJ00050	BOOTH LANDING	FWC - Guana River Wildlife Mgt.	Artifact scatter-low density (< 2per sq meter)
SJ00072	CAPO CREEK	FWC - Guana River Wildlife Mgt.	Prehistoric shell midden
SJ02463	GUANA RIVER	FWC - Guana River Wildlife Mgt.	Prehistoric shell midden
SJ02464	OLD SAW MILL	FWC - Guana River Wildlife Mgt.	Prehistoric shell midden
SJ02554	GUANA RIVER SHELL RING	FWC - Guana River Wildlife Mgt.	Habitation (prehistoric)
SJ02555	NN	FWC - Guana River Wildlife Mgt.	Prehistoric shell midden
SJ02556	NN	FWC - Guana River Wildlife Mgt.	Prehistoric shell midden
SJ02557	NN	FWC - Guana River Wildlife Mgt.	Prehistoric shell midden

Northern Component

FMSF #	Site Name	Property Management	Description
SJ02558	NN	FWC - Guana River Wildlife Mgt.	Prehistoric shell midden
SJ02559	NN	FWC - Guana River Wildlife Mgt.	Prehistoric shell midden
SJ03242	NORTH FIRE CUT	FWC - Guana River Wildlife Mgt.	Building remains
SJ03243	COQUINA BLOCK	FWC - Guana River Wildlife Mgt.	Building remains
SJ03253	MCNEIL POND EAST	FWC - Guana River Wildlife Mgt.	Campsite (prehistoric)
SJ03254	BRITISH DIKES	FWC - Guana River Wildlife Mgt.	Agriculture/Farm structure
SJ03255	SUGAR MILL	FWC - Guana River Wildlife Mgt.	Mill of unspecified function
SJ03485	HUNTER'S FIND	FWC - Guana River Wildlife Mgt.	Prehistoric midden
SJ04802	COQUINA	FWC - Guana River Wildlife Mgt.	Historic well
SJ04987	CATTLE DIP	FWC - Guana River Wildlife Mgt.	Land-terrestrial
SJ03148	NEDER MIDDEN	SJRWMD - Stokes Landing Con Area	Site for procurement of raw materials
SJ03184	NEDER ISLAND	SJRWMD - Stokes Landing Con Area	Building remains

Southern Component

FMSF #	Site Name	Property Management	Description
SJ03203	RHOTAN MIDDEN	CAMA - Pellicer Creek AP	Prehistoric shell midden
FL00002	MARINELAND MIDDEN	CAMA - GTMNERR	Prehistoric midden
FL00010	HOMESTEAD MIDDEN	CAMA - GTMNERR	Prehistoric midden(s)
FL00026	MALA COMPRA	CAMA - GTMNERR	Agriculture/Farm structure
FL00027	MAKER MIDDEN	CAMA - GTMNERR	Prehistoric shell midden
FL00030	WATERWAY MIDDEN	CAMA - GTMNERR	Prehistoric shell midden
FL00031	PIRATES COVE MIDDEN	CAMA - GTMNERR	Prehistoric shell midden
SJ00042	WEFF	CAMA - GTMNERR	Prehistoric shell midden
SJ00043	CRESCENT BEACH	CAMA - GTMNERR	Prehistoric shell midden
SJ00046	SUMMER HAVEN	CAMA - GTMNERR	Prehistoric shell midden
SJ00090	POMPANO FARM	CAMA - GTMNERR	Prehistoric shell midden
SJ03131	SAND DOLLAR MIDDEN I	CAMA - GTMNERR	Site for procurement of raw materials
SJ03132	SAND DOLLAR MIDDEN II	CAMA - GTMNERR	Site for procurement of raw materials
SJ03157	EVANS	CAMA - GTMNERR	Prehistoric shell midden
SJ03167	P V KELLEY	CAMA - GTMNERR	Prehistoric shell midden
SJ03168	CRESCENT BEACH 2	CAMA - GTMNERR	Land-terrestrial
SJ03169	RIVERVIEW	CAMA - GTMNERR	Prehistoric shell midden
SJ03171	GRIFFIN	CAMA - GTMNERR	Land-terrestrial
SJ03173	SOUTH CRESCENT BEACH	CAMA - GTMNERR	Prehistoric shell midden
SJ03289	WEARY TUNE	CAMA - GTMNERR	Campsite (prehistoric)
SJ03740	HENANDEZ ISLAND	CAMA - GTMNERR	Prehistoric shell midden
SJ03756	MOSES CREEK POINT	CAMA - GTMNERR	Building remains
SJ00035	ROOTAN BRANCH COMPLEX & MOUNDS	DEP - Faver-Dykes State Park	Building remains
SJ03133	HEMMING POINT	DEP - Faver-Dykes State Park	Prehistoric shell midden
SJ03742	FDSP CAMPGROUND NATURE TRAIL	DEP - Faver-Dykes State Park	Artifact scatter-low density (< 2 per sq meter)
SJ04990	CLUSTER 1	DEP - Faver-Dykes State Park	Building remains
FL00011	WASHINGTON OAKS MIDDEN	DEP- Washington Oaks State Park	Prehistoric shell midden
FL00032	SOUTHERN MIDDEN	DEP- Washington Oaks State Park	Land-terrestrial
FL00175	BIG OAK	DEP- Washington Oaks State Park	Habitation (prehistoric)
FL00176	SAND DUNE	DEP- Washington Oaks State Park	Campsite (prehistoric)
FL00187	BING'S LANDING	Flagler County Parks	Building remains
FL00012	WADSWORTH MIDDEN	Flagler County-Princess Place Pre.	Prehistoric shell midden

Southern Component

FMSF #	Site Name	Property Management	Description
FL00145	ROBERSON HOUSE	Flagler County-Princess Place Pre.	Building remains
FL00252	MARINELAND HAMMOCK	Flagler County - River To Sea Pre.	Site for procurement of raw materials
SJ00028	FORT MATANZAS MIDDEN	NPS - Ft Matanzas Nat. Monument	Prehistoric midden
SJ00044B	FT MATANZAS NATIONAL MON. (ARCH'L)	NPS - Ft Matanzas Nat. Monument	Historic fort
SJ03225	VISITOR CENTER MIDDEN/FOMA 5	NPS - Ft Matanzas Nat. Monument	Site for procurement of raw materials
SJ03231	FOMA-003	NPS - Ft Matanzas Nat. Monument	Historic refuse / Dump
SJ03232	FOMA-004	NPS - Ft Matanzas Nat. Monument	Historic refuse / Dump
SJ03233	FOMA-006	NPS - Ft Matanzas Nat. Monument	Homestead
SJ03241	CUSTOMS HOUSE SITE	NPS - Ft Matanzas Nat. Monument	Habitation (prehistoric)
SJ03159	MURAT POINT	SJRWMD - Moses Creek Cons. Area	Campsite (prehistoric)
SJ03160	GOVERNMENT ISLAND MIDDEN	SJRWMD - Moses Creek Cons. Area	Prehistoric shell midden
SJ03294	POTSHOT SITE	SJRWMD - Moses Creek Cons. Area	Land-terrestrial
SJ03295	LAST RISE SITE	SJRWMD - Moses Creek Cons. Area	Land-terrestrial
SJ03315	MOSES CREEK CONSERVATION AREA	SJRWMD - Moses Creek Cons. Area	Building remains
SJ03751	BRADDOCK'S POINT	SJRWMD - Moses Creek Cons. Area	Campsite (prehistoric)
SJ03752	MOSES CREEK BLUFF	SJRWMD - Moses Creek Cons. Area	Campsite (prehistoric)
SJ03753	CROSSROADS	SJRWMD - Moses Creek Cons. Area	Land-terrestrial
SJ03754	MORSES CREEK MOUND	SJRWMD - Moses Creek Cons. Area	Land-terrestrial
SJ03755	BADDOCK POINT 2	SJRWMD - Moses Creek Cons. Area	Building remains
FL00140	FT FULTON	SJRWMD - Pellicer Creek Cons. Area	Historic refuse / Dump
FL00146	DUPONT MILL	SJRWMD - Pellicer Creek Cons. Area	Sugar mill
FL00149	MURITT'S OLDFIELD AND HOUSE	SJRWMD - Pellicer Creek Cons. Area	Building remains
FL00186	OLD KING'S ROAD	SJRWMD - Pellicer Creek Cons. Area	Land-terrestrial

Resource Data

B.1 / Code of Federal Regulations

SUBCHAPTER B—OCEAN AND COASTAL RESOURCE MANAGEMENT

PART 921—NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM REG- ULATIONS

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APPENDIX I TO PART 921—BIOGEOGRAPHIC CLASSIFICATION SCHEME

APPENDIX II TO PART 921—TYPOLOGY OF NATIONAL ESTUARINE RESEARCH RESERVES

AUTHORITY: Section 315 of the Coastal Zone Management Act, as amended (16 U.S.C. 1461).

SOURCE: 58 FR 38215, July 15, 1993, unless otherwise noted.

Subpart A—General

§921.1 Mission, goals and general provisions.

(a) The mission of the National Estuarine Research Reserve Program is the establishment and management, through Federal-state cooperation, of a national system (National Estuarine Research Reserve System or System) of estuarine research reserves (National Estuarine Research Reserves or Reserves) representative of the various regions and estuarine types in the United States. National Estuarine Research Reserves are established to provide opportunities for long-term research, education, and interpretation.

(b) The goals of the Program are to:

(1) Ensure a stable environment for research through long-term protection of National Estuarine Research Reserve resources;

(2) Address coastal management issues identified as significant through coordinated estuarine research within the System;

(3) Enhance public awareness and understanding of estuarine areas and provide suitable opportunities for public education and interpretation;

(4) Promote Federal, state, public and private use of one or more Reserves within the System when such entities conduct estuarine research; and

(5) Conduct and coordinate estuarine research within the System, gathering and making available information necessary for improved understanding and management of estuarine areas.

(c) National Estuarine Research Reserves shall be open to the public to the extent permitted under state and Federal law. Multiple uses are allowed to the degree compatible with each Reserve's overall purpose as provided in the management plan (see §921.13) and consistent with paragraphs (a) and (b) of this section. Use levels are set by the state where the Reserve is located and analyzed in the management plan. The Reserve management plan shall describe the uses and establish priorities among these uses. The plan shall identify uses requiring a state permit, as well as areas where uses are encouraged or prohibited. Consistent with resource protection and research objectives, public access and use may be restricted to certain areas or components within a Reserve.

(d) Habitat manipulation for research purposes is allowed consistent with the following limitations. Manipulative research activities must be specified in the management plan, be consistent with the mission and goals of the program (see paragraphs (a) and (b) of this section) and the goals and objectives set forth in the Reserve's management plan, and be limited in nature and extent to the minimum manipulative activity necessary to accomplish the stated research objective. Manipulative research activities with a significant or long-term impact on Reserve resources require the prior approval of the state and the National Oceanic and Atmospheric Administration (NOAA). Manipulative research activities which can reasonably be expected to have a significant adverse impact on the estuarine resources and habitat of a Reserve, such that the activities themselves or their resulting short- and

long-term consequences compromise the representative character and integrity of a Reserve, are prohibited. Habitat manipulation for resource management purposes is prohibited except as specifically approved by NOAA as: (1) A restoration activity consistent with paragraph (e) of this section; or (2) an activity necessary for the protection of public health or the preservation of other sensitive resources which have been listed or are eligible for protection under relevant Federal or state authority (e.g., threatened/endangered species or significant historical or cultural resources) or if the manipulative activity is a long-term pre-existing use (*i.e.*, has occurred prior to designation) occurring in a buffer area. If habitat manipulation is determined to be necessary for the protection of public health, the preservation of sensitive resources, or if the manipulation is a long-term pre-existing use in a buffer area, then these activities shall be specified in the Reserve management plan in accordance with §921.13(a)(10) and shall be limited to the reasonable alternative which has the least adverse and shortest term impact on the representative and ecological integrity of the Reserve.

(e) Under the Act an area may be designated as an estuarine Reserve only if the area is a representative estuarine ecosystem that is suitable for long-term research. Many estuarine areas have undergone some ecological change as a result of human activities (e.g., hydrological changes, intentional/unintentional species composition changes—introduced and exotic species). In those areas proposed or designated as National Estuarine Research Reserves, such changes may have diminished the representative character and integrity of the site. Although restoration of degraded areas is not a primary purpose of the System, such activities may be permitted to improve the representative character and integrity of a Reserve. Restoration activities must be carefully planned and approved by NOAA through the Reserve management plan. Historical research may be necessary to determine the "natural" representative state of an estuarine area (*i.e.*, an estuarine ecosystem minimally affected by

human activity or influence). Frequently, restoration of a degraded estuarine area will provide an excellent opportunity for management oriented research.

(f) NOAA may provide financial assistance to coastal states, not to exceed, per Reserve, 50 percent of all actual costs or \$5 million whichever amount is less, to assist in the acquisition of land and waters, or interests therein. NOAA may provide financial assistance to coastal states not to exceed 70 percent of all actual costs for the management and operation of, the development and construction of facilities, and the conduct of educational or interpretive activities concerning Reserves (see subpart I). NOAA may provide financial assistance to any coastal state or public or private person, not to exceed 70 percent of all actual costs, to support research and monitoring within a Reserve. Notwithstanding any financial assistance limits established by this Part, when financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, such assistance may be used to pay 100 percent of all actual costs of activities carried out with this assistance, as long as such funds are available. Predesignation, acquisition and development, operation and management, special research and monitoring, and special education and interpretation awards are available under the National Estuarine Reserve Program. Predesignation awards are for site selection/feasibility, draft management plan preparation and conduct of basic characterization studies. Acquisition and development awards are intended primarily for acquisition of interests in land, facility construction and to develop and/or upgrade research, monitoring and education programs. Operation and management awards provide funds to assist in implementing, operating and managing the administrative, and basic research, monitoring and education programs, outlined in the Reserve management plan. Special research and monitoring awards provide funds to conduct estuarine research and monitoring projects with the System. Special educational and interpretive awards provide funds to conduct estuarine educational and

interpretive projects within the System.

(g) Lands already in protected status managed by other Federal agencies, state or local governments, or private organizations may be included within National Estuarine Research Reserves only if the managing entity commits to long-term management consistent with paragraphs (d) and (e) of this section in the Reserve management plan. Federal lands already in protected status may not comprise a majority of the key land and water areas of a Reserve (see §921.11(c)(3)).

(h) To assist the states in carrying out the Program's goals in an effective manner, NOAA will coordinate a research and education information exchange throughout the National Estuarine Research Reserve System. As part of this role, NOAA will ensure that information and ideas from one Reserve are made available to others in the System. The network will enable Reserves to exchange information and research data with each other, with universities engaged in estuarine research, and with Federal, state, and local agencies. NOAA's objective is a system-wide program of research and monitoring capable of addressing the management issues that affect long-term productivity of our Nation's estuaries.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12540, Mar. 17, 1997; 63 FR 26717, May 14, 1998]

§921.2 Definitions.

(a) *Act* means the Coastal Zone Management Act of 1972, as amended, 16 U.S.C. 1451 *et seq.*

(b) *Assistant Administrator* means the Assistant Administrator for Ocean Services and Coastal Zone Management or delegee.

(c) *Coastal state* means a state of the United States, in or bordering on, the Atlantic, Pacific, or Arctic Ocean, the Gulf of Mexico, Long Island Sound, or one or more of the Great Lakes. For the purposes of these regulations the term also includes Puerto Rico, the Virgin Islands, Guam, the Commonwealth of the Northern Mariana Islands, the Trust Territories of the Pacific Islands, and American Samoa (see 16 U.S.C. 1453(4)).

(d) *State agency* means an instrumentality of a coastal state to whom the coastal state has delegated the authority and responsibility for the creation and/or management/operation of a National Estuarine Research Reserve. Factors indicative of this authority may include the power to receive and expend funds on behalf of the Reserve, acquire and sell or convey real and personal property interests, adopt rules for the protection of the Reserve, enforce rules applicable to the Reserve, or develop and implement research and education programs for the reserve. For the purposes of these regulations, the terms "coastal state" and "State agency" shall be synonymous.

(e) *Estuary* means that part of a river or stream or other body of water having unimpaired connection with the open sea, where the sea water is measurably diluted with fresh water derived from land drainage. The term also includes estuary-type areas with measurable freshwater influence and having unimpaired connections with the open sea, and estuary-type areas of the Great Lakes and their connecting waters (see 16 U.S.C. 1453(7)).

(f) *National Estuarine Research Reserve* means an area that is a representative estuarine ecosystem suitable for long-term research, which may include all of the key land and water portion of an estuary, and adjacent transitional areas and uplands constituting to the extent feasible a natural unit, and which is set aside as a natural field laboratory to provide long-term opportunities for research, education, and interpretation on the ecological relationships within the area (see 16 U.S.C. 1453(8)) and meets the requirements of 16 U.S.C. 1461(b). This includes those areas designated as National Estuarine Sanctuaries or Reserves under section 315 of the Act prior to enactment of the Coastal Zone Act Reauthorization Amendments of 1990 and each area subsequently designated as a National Estuarine Research Reserve.

§921.3 National Estuarine Research Reserve System biogeographic classification scheme and estuarine typologies.

(a) National Estuarine Research Reserves are chosen to reflect regional

differences and to include a variety of ecosystem types. A biogeographic classification scheme based on regional variations in the nation's coastal zone has been developed. The biogeographic classification scheme is used to ensure that the National Estuarine Research Reserve System includes at least one site from each region. The estuarine typology system is utilized to ensure that sites in the System reflect the wide range of estuarine types within the United States.

(b) The biogeographic classification scheme, presented in appendix I, contains 29 regions. Figure 1 graphically depicts the biogeographic regions of the United States.

(c) The typology system is presented in appendix II.

§921.4 Relationship to other provisions of the Coastal Zone Management Act, and to the Marine Protection, Research and Sanctuaries Act.

(a) The National Estuarine Research Reserve System is intended to provide information to state agencies and other entities involved in addressing coastal management issues. Any coastal state, including those that do not have approved coastal management programs under section 306 of the Act, is eligible for an award under the National Estuarine Research Reserve Program (see §921.2(c)).

(b) For purposes of consistency review by states with a federally approved coastal management program, the designation of a National Estuarine Research Reserve is deemed to be a Federal activity, which, if directly affecting the state's coastal zone, must be undertaken in a manner consistent to the maximum extent practicable with the approved state coastal management program as provided by section 1456(c)(1) of the Act, and implementing regulations at 15 CFR part 930, subpart C. In accordance with section 1456(c)(1) of the Act and the applicable regulations NOAA will be responsible for certifying that designation of the Reserve is consistent with the state's approved coastal management program. The state must concur with or object to the certification. It is recommended that the lead state agency for Reserve designation consult, at the

earliest practicable time, with the appropriate state officials concerning the consistency of a proposed National Estuarine Research Reserve.

(c) The National Estuarine Research Reserve Program will be administered in close coordination with the National Marine Sanctuary Program (Title III of the Marine Protection, Research and Sanctuaries Act, as amended, 16 U.S.C. 1431-1445), also administered by NOAA. Title III authorizes the Secretary of Commerce to designate discrete areas of the marine environment as National Marine Sanctuaries to protect or restore such areas for their conservation, recreational, ecological, historical, research, educational or esthetic values. National Marine Sanctuaries and Estuarine Research Reserves may not overlap, but may be adjacent.

Subpart B—Site Selection, Post Site Selection and Management Plan Development

§ 921.10 General.

(a) A coastal state may apply for Federal financial assistance for the purpose of site selection, preparation of documents specified in § 921.13 (draft management plan (DMP) and environmental impact statement (EIS)), and the conduct of limited basic characterization studies. The total Federal share of this assistance may not exceed \$100,000. Federal financial assistance for preacquisition activities under § 921.11 and § 921.12 is subject to the total \$5 million for which each Reserve is eligible for land acquisition. Notwithstanding the above, when financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, such assistance may be used to pay 100 percent of all actual costs of activities carried out with this assistance, as long as such funds are available. In the case of a biogeographic region (see appendix I) shared by two or more coastal states, each state is eligible for Federal financial assistance to establish a separate National Estuarine Research Reserve within their respective portion of the shared biogeographic region. Each separate National Estuarine Research Reserve is eligible for the full complement of

funding. Financial assistance application procedures are specified in subpart I.

(b) In developing a Reserve program, a state may choose to develop a multiple-site Reserve reflecting a diversity of habitats in a single biogeographic region. A multiple-site Reserve allows the state to develop complementary research and educational programs within the individual components of its multi-site Reserve. Multiple-site Reserves are treated as one Reserve in terms of financial assistance and development of an overall management framework and plan. Each individual site of a proposed multiple-site Reserve shall be evaluated both separately under § 921.11(c) and collectively as part of the site selection process. A coastal state may propose to establish a multiple-site Reserve at the time of the initial site selection, or at any point in the development or operation of the Reserve. If the state decides to develop a multiple-site National Estuarine Research Reserve after the initial acquisition and development award is made for a single site, the proposal is subject to the requirements set forth in § 921.33(b). However, a state may not propose to add one or more sites to an already designated Reserve if the operation and management of such Reserve has been found deficient and uncorrected or the research conducted is not consistent with the Estuarine Research Guidelines referenced in § 921.51. In addition, Federal funds for the acquisition of a multiple-site Reserve remain limited to \$5,000,000 (see § 921.20). The funding for operation of a multiple-site Reserve is limited to the maximum allowed for any one Reserve per year (see § 921.32(c)) and preacquisition funds are limited to \$100,000 per Reserve. Notwithstanding the above, when financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, such assistance may be used to pay 100 percent of all actual costs of activities carried out with this assistance, as long as such funds are available.

[58 FR 38215, July 15, 1993, as amended at 63 FR 26717, May 14, 1998]

§ 921.11 Site selection and feasibility.

(a) A coastal state may use Federal funds to establish and implement a site selection process which is approved by NOAA.

(b) In addition to the requirements set forth in subpart I, a request for Federal funds for site selection must contain the following programmatic information:

(1) A description of the proposed site selection process and how it will be implemented in conformance with the biogeographic classification scheme and typology (§ 921.3);

(2) An identification of the site selection agency and the potential management agency; and

(3) A description of how public participation will be incorporated into the process (see § 921.11(d)).

(c) As part of the site selection process, the state and NOAA shall evaluate and select the final site(s). NOAA has final authority in approving such sites. Site selection shall be guided by the following principles:

(1) The site's contribution to the biogeographical and typological balance of the National Estuarine Research Reserve System. NOAA will give priority consideration to proposals to establish Reserves in biogeographic regions or subregions or incorporating types that are not represented in the system. (see the biogeographic classification scheme and typology set forth in § 921.3 and appendices I and II);

(2) The site's ecological characteristics, including its biological productivity, diversity of flora and fauna, and capacity to attract a broad range of research and educational interests. The proposed site must be a representative estuarine ecosystem and should, to the maximum extent possible, be an estuarine ecosystem minimally affected by human activity or influence (see § 921.1(e)).

(3) Assurance that the site's boundaries encompass an adequate portion of the key land and water areas of the natural system to approximate an ecological unit and to ensure effective conservation. Boundary size will vary greatly depending on the nature of the ecosystem. Reserve boundaries must encompass the area within which adequate control has or will be established

by the managing entity over human activities occurring within the Reserve. Generally, Reserve boundaries will encompass two areas: Key land and water areas (or "core area") and a buffer zone. Key land and water areas and a buffer zone will likely require significantly different levels of control (see § 921.13(a)(7)). The term "key land and water areas" refers to that core area within the Reserve that is so vital to the functioning of the estuarine ecosystem that it must be under a level of control sufficient to ensure the long-term viability of the Reserve for research on natural processes. Key land and water areas, which comprise the core area, are those ecological units of a natural estuarine system which preserve, for research purposes, a full range of significant physical, chemical and biological factors contributing to the diversity of fauna, flora and natural processes occurring within the estuary. The determination of which land and water areas are "key" to a particular Reserve must be based on specific scientific knowledge of the area. A basic principle to follow when deciding upon key land and water areas is that they should encompass resources representative of the total ecosystem, and which if compromised could endanger the research objectives of the Reserve. The term *buffer zone* refers to an area adjacent to or surrounding key land and water areas and essential to their integrity. Buffer zones protect the core area and provide additional protection for estuarine-dependent species, including those that are rare or endangered. When determined appropriate by the state and approved by NOAA, the buffer zone may also include an area necessary for facilities required for research and interpretation. Additionally, buffer zones should be established sufficient to accommodate a shift of the core area as a result of biological, ecological or geomorphological change which reasonably could be expected to occur. National Estuarine Research Reserves may include existing Federal or state lands already in a protected status where mutual benefit can be enhanced. However, NOAA will not approve a site

for potential National Estuarine Research Reserve status that is dependent primarily upon the inclusion of currently protected Federal lands in order to meet the requirements for Reserve status (such as key land and water areas). Such lands generally will be included within a Reserve to serve as a buffer or for other ancillary purposes; and may be included, subject to NOAA approval, as a limited portion of the core area;

(4) The site's suitability for long-term estuarine research, including ecological factors and proximity to existing research facilities and educational institutions;

(5) The site's compatibility with existing and potential land and water uses in contiguous areas as well as approved coastal and estuarine management plans; and

(6) The site's importance to education and interpretive efforts, consistent with the need for continued protection of the natural system.

(d) Early in the site selection process the state must seek the views of affected landowners, local governments, other state and Federal agencies and other parties who are interested in the area(s) being considered for selection as a potential National Estuarine Research Reserve. After the local government(s) and affected landowner(s) have been contacted, at least one public meeting shall be held in the vicinity of the proposed site. Notice of such a meeting, including the time, place, and relevant subject matter, shall be announced by the state through the area's principal newspaper at least 15 days prior to the date of the meeting and by NOAA in the FEDERAL REGISTER.

(e) A state request for NOAA approval of a proposed site (or sites in the case of a multi-site Reserve) must contain a description of the proposed site(s) in relationship to each of the site selection principals (§921.11(c)) and the following information:

(1) An analysis of the proposed site(s) based on the biogeographical scheme/typology discussed in §921.3 and set forth in appendices I and II;

(2) A description of the proposed site(s) and its (their) major resources, including location, proposed bound-

aries, and adjacent land uses. Maps are required;

(3) A description of the public participation process used by the state to solicit the views of interested parties, a summary of comments, and, if interstate issues are involved, documentation that the Governor(s) of the other affected state(s) has been contacted. Copies of all correspondence, including contact letters to all affected landowners must be appended;

(4) A list of all sites considered and a brief statement of the reasons why a site was not preferred; and

(5) A nomination of the proposed site(s) for designation as a National Estuarine Research Reserve by the Governor of the coastal state in which the state is located.

(f) A state proposing to reactivate an inactive site, previously approved by NOAA for development as an Estuarine Sanctuary or Reserve, may apply for those funds remaining, if any, provided for site selection and feasibility (§921.11a)) to determine the feasibility of reactivation. This feasibility study must comply with the requirements set forth in §921.11 (c) through (e).

§921.12 Post site selection.

(a) At the time of the coastal state's request for NOAA approval of a proposed site, the state may submit a request for funds to develop the draft management plan and for preparation of the EIS. At this time, the state may also submit a request for the remainder of the predesignation funds to perform a limited basic characterization of the physical, chemical and biological characteristics of the site approved by NOAA necessary for providing EIS information to NOAA. The state's request for these post site selection funds must be accompanied by the information specified in subpart I and, for draft management plan development and EIS information collection, the following programmatic information:

(1) A draft management plan outline (see §921.13(a) below); and

(2) An outline of a draft memorandum of understanding (MOU) between the state and NOAA detailing the Federal-state role in Reserve management during the initial period of Federal funding and expressing the

state's long-term commitment to operate and manage the Reserve.

(b) The state is eligible to use the funds referenced in §921.12(a) after the proposed site is approved by NOAA under the terms of §921.11.

§921.13 Management plan and environmental impact statement development.

(a) After NOAA approves the state's proposed site and application for funds submitted pursuant to §921.12, the state may begin draft management plan development and the collection of information necessary for the preparation by NOAA of an EIS. The state shall develop a draft management plan, including an MOU. The plan shall set out in detail:

(1) Reserve goals and objectives, management issues, and strategies or actions for meeting the goals and objectives;

(2) An administrative plan including staff roles in administration, research, education/interpretation, and surveillance and enforcement;

(3) A research plan, including a monitoring design;

(4) An education/interpretive plan;

(5) A plan for public access to the Reserve;

(6) A construction plan, including a proposed construction schedule, general descriptions of proposed developments and general cost estimates. Information should be provided for proposed minor construction projects in sufficient detail to allow these projects to begin in the initial phase of acquisition and development. A categorical exclusion, environmental assessment, or EIS may be required prior to construction;

(7)(i) An acquisition plan identifying the ecologically key land and water areas of the Reserve, ranking these areas according to their relative importance, and including a strategy for establishing adequate long-term state control over these areas sufficient to provide protection for Reserve resources to ensure a stable environment for research. This plan must include an identification of ownership within the proposed Reserve boundaries, including land already in the public domain; the method(s) of acquisition which the

state proposes to use—acquisition (including less-than-fee simple options) to establish adequate long-term state control; an estimate of the fair market value of any property interest—which is proposed for acquisition; a schedule estimating the time required to complete the process of establishing adequate state control of the proposed research reserve; and a discussion of any anticipated problems. In selecting a preferred method(s) for establishing adequate state control over areas within the proposed boundaries of the Reserve, the state shall perform the following steps for each parcel determined to be part of the key land and water areas (control over which is necessary to protect the integrity of the Reserve for research purposes), and for those parcels required for research and interpretive support facilities or buffer purposes:

(A) Determine, with appropriate justification, the minimum level of control(s) required [e.g., management agreement, regulation, less-than-fee simple property interest (e.g., conservation easement), fee simple property acquisition, or a combination of these approaches]. This does not preclude the future necessity of increasing the level of state control;

(B) Identify the level of existing state control(s);

(C) Identify the level of additional state control(s), if any, necessary to meet the minimum requirements identified in paragraph (a)(7)(i)(A) of this section;

(D) Examine all reasonable alternatives for attaining the level of control identified in paragraph (a)(7)(i)(C) of this section, and perform a cost analysis of each; and

(E) Rank, in order of cost, the methods (including acquisition) identified in paragraph (a)(7)(i)(D) of this section.

(ii) An assessment of the relative cost-effectiveness of control alternatives shall include a reasonable estimate of both short-term costs (e.g., acquisition of property interests, regulatory program development including associated enforcement costs, negotiation, adjudication, etc.) and long-term costs (e.g., monitoring, enforcement,

adjudication, management and coordination). In selecting a preferred method(s) for establishing adequate state control over each parcel examined under the process described above, the state shall give priority consideration to the least costly method(s) of attaining the minimum level of long-term control required. Generally, with the possible exception of buffer areas required for support facilities, the level of control(s) required for buffer areas will be considerably less than that required for key land and water areas. This acquisition plan, after receiving the approval of NOAA, shall serve as a guide for negotiations with landowners. A final boundary for the reserve shall be delineated as a part of the final management plan;

(8) A resource protection plan detailing applicable authorities, including allowable uses, uses requiring a permit and permit requirements, any restrictions on use of the research reserve, and a strategy for research reserve surveillance and enforcement of such use restrictions, including appropriate government enforcement agencies;

(9) If applicable, a restoration plan describing those portions of the site that may require habitat modification to restore natural conditions;

(10) If applicable, a resource manipulation plan, describing those portions of the Reserve buffer in which long-term pre-existing (prior to designation) manipulation for reasons not related to research or restoration is occurring. The plan shall explain in detail the nature of such activities, shall justify why such manipulation should be permitted to continue within the reserve buffer; and shall describe possible effects of this manipulation on key land and water areas and their resources;

(11) A proposed memorandum of understanding (MOU) between the state and NOAA regarding the Federal-state relationship during the establishment and development of the National Estuarine Research Reserve, and expressing a long-term commitment by the state to maintain and manage the Reserve in accordance with section 315 of the Act, 16 U.S.C. 1461, and applicable regulations. In conjunction with the MOU, and where possible under state law, the state will consider taking appropriate

administrative or legislative action to ensure the long-term protection and operation of the National Estuarine Research Reserve. If other MOUs are necessary (such as with a Federal agency, another state agency or private organization), drafts of such MOUs must be included in the plan. All necessary MOU's shall be signed prior to Reserve designation; and

(12) If the state has a federally approved coastal management program, a certification that the National Estuarine Research Reserve is consistent to the maximum extent practicable with that program. See §§921.4(b) and 921.30(b).

(b) Regarding the preparation of an EIS under the National Environmental Policy Act on a National Estuarine Research Reserve proposal, the state and NOAA shall collect all necessary information concerning the socioeconomic and environmental impacts associated with implementing the draft management plan and feasible alternatives to the plan. Based on this information, the state will draft and provide NOAA with a preliminary EIS.

(c) Early in the development of the draft management plan and the draft EIS, the state and NOAA shall hold a scoping meeting (pursuant to NEPA) in the area or areas most affected to solicit public and government comments on the significant issues related to the proposed action. NOAA will publish a notice of the meeting in the FEDERAL REGISTER at least 15 days prior to the meeting. The state shall be responsible for publishing a similar notice in the local media.

(d) NOAA will publish a FEDERAL REGISTER notice of intent to prepare a draft EIS. After the draft EIS is prepared and filed with the Environmental Protection Agency (EPA), a Notice of Availability of the draft EIS will appear in the FEDERAL REGISTER. Not less than 30 days after publication of the notice, NOAA will hold at least one public hearing in the area or areas most affected by the proposed national estuarine research reserve. The hearing will be held no sooner than 15 days after appropriate notice of the meeting has been given in the principal news media by the state and in the FEDERAL REGISTER by NOAA. After a 45-day

comment period, a final EIS will be prepared by the state and NOAA.

Subpart C—Acquisition, Development and Preparation of the Final Management Plan

§ 921.20 General.

The acquisition and development period is separated into two major phases. After NOAA approval of the site, draft management plan and draft MOU, and completion of the final EIS, a coastal state is eligible for an initial acquisition and development award(s). In this initial phase, the state should work to meet the criteria required for formal research reserve designation; e.g., establishing adequate state control over the key land and water areas as specified in the draft management plan and preparing the final management plan. These requirements are specified in § 921.30. Minor construction in accordance with the draft management plan may also be conducted during this initial phase. The initial acquisition and development phase is expected to last no longer than three years. If necessary, a longer time period may be negotiated between the state and NOAA. After Reserve designation, a state is eligible for a supplemental acquisition and development award(s) in accordance with § 921.31. In this post-designation acquisition and development phase, funds may be used in accordance with the final management plan to construct research and educational facilities, complete any remaining land acquisition, for program development, and for restorative activities identified in the final management plan. In any case, the amount of Federal financial assistance provided to a coastal state with respect to the acquisition of lands and waters, or interests therein, for any one National Estuarine Research Reserve may not exceed an amount equal to 50 percent of the costs of the lands, waters, and interests therein or \$5,000,000, whichever amount is less, except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of all actual costs of activities carried out

with this assistance, as long as such funds are available.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12540, Mar. 17, 1997; 63 FR 26717, May 14, 1998]

§ 921.21 Initial acquisition and development awards.

(a) Assistance is provided to aid the recipient prior to designation in:

(1) Acquiring a fee simple or less-than-fee simple real property interest in land and water areas to be included in the Reserve boundaries (see § 921.13(a)(7); § 921.30(d));

(2) Minor construction, as provided in paragraphs (b) and (c) of this section;

(3) Preparing the final management plan; and

(4) Initial management costs, e.g., for implementing the NOAA approved draft management plan, hiring a Reserve manager and other staff as necessary and for other management-related activities. Application procedures are specified in subpart I.

(b) The expenditure of Federal and state funds on major construction activities is not allowed during the initial acquisition and development phase. The preparation of architectural and engineering plans, including specifications, for any proposed construction, or for proposed restorative activities, is permitted. In addition, minor construction activities, consistent with paragraph (c) of this section also are allowed. The NOAA-approved draft management plan must, however, include a construction plan and a public access plan before any award funds can be spent on construction activities.

(c) Only minor construction activities that aid in implementing portions of the management plan (such as boat ramps and nature trails) are permitted during the initial acquisition and development phase. No more than five (5) percent of the initial acquisition and development award may be expended on such activities. NOAA must make a specific determination, based on the final EIS, that the construction activity will not be detrimental to the environment.

(d) Except as specifically provided in paragraphs (a) through (c) of this section, construction projects, to be funded in whole or in part under an acquisition and development award(s), may not be initiated until the Reserve receives formal designation (see §921.30). This requirement has been adopted to ensure that substantial progress in establishing adequate state control over key land and water areas has been made and that a final management plan is completed before major sums are spent on construction. Once substantial progress in establishing adequate state control/acquisition has been made, as defined by the state in the management plan, other activities guided by the final management plan may begin with NOAA's approval.

(e) For any real property acquired in whole or part with Federal funds for the Reserve, the state shall execute suitable title documents to include substantially the following provisions, or otherwise append the following provisions in a manner acceptable under applicable state law to the official land record(s):

(1) Title to the property conveyed by this deed shall vest in the [recipient of the award granted pursuant to section 315 of the Act, 16 U.S.C. 1461 or other NOAA approved state agency] subject to the condition that the designation of the [name of National Estuarine Reserve] is not withdrawn and the property remains part of the federally designated [name of National Estuarine Research Reserve]; and

(2) In the event that the property is no longer included as part of the Reserve, or if the designation of the Reserve of which it is part is withdrawn, then NOAA or its successor agency, after full and reasonable consultation with the State, may exercise the following rights regarding the disposition of the property:

(i) The recipient may retain title after paying the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the current fair market value of the property;

(ii) If the recipient does not elect to retain title, the Federal Government may either direct the recipient to sell

the property and pay the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the proceeds from the sale (after deducting actual and reasonable selling and repair or renovation expenses, if any, from the sale proceeds), or direct the recipient to transfer title to the Federal Government. If directed to transfer title to the Federal Government, the recipient shall be entitled to compensation computed by applying the recipient's percentage of participation in the cost of the original project to the current fair market value of the property; and

(iii) Fair market value of the property must be determined by an independent appraiser and certified by a responsible official of the state, as provided by Department of Commerce regulations at 15 CFR part 24, and Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally assisted programs at 15 CFR part 11.

(f) Upon instruction by NOAA, provisions analogous to those of §921.21(e) shall be included in the documentation underlying less-than-fee-simple interests acquired in whole or part with Federal funds.

(g) Federal funds or non-Federal matching share funds shall not be spent to acquire a real property interest in which the state will own the land concurrently with another entity unless the property interest has been identified as a part of an acquisition strategy pursuant to §921.13(7) which has been approved by NOAA prior to the effective date of these regulations.

(h) Prior to submitting the final management plan to NOAA for review and approval, the state shall hold a public meeting to receive comment on the plan in the area affected by the estuarine research reserve. NOAA will publish a notice of the meeting in the FEDERAL REGISTER at least 15 days prior to the public meeting. The state shall be responsible for having a similar notice published in the local newspaper(s).

Subpart D—Reserve Designation and Subsequent Operation

§ 921.30 Designation of National Estuarine Research Reserves.

(a) The Under Secretary may designate an area proposed for designation by the Governor of the state in which it is located, as a National Estuarine Research Reserve if the Under Secretary finds:

(1) The area is a representative estuarine ecosystem that is suitable for long-term research and contributes to the biogeographical and typological balance of the System;

(2) Key land and water areas of the proposed Reserve, as identified in the management plan, are under adequate state control sufficient to provide long-term protection for reserve resources to ensure a stable environment for research;

(3) Designation of the area as a Reserve will serve to enhance public awareness and understanding of estuarine areas, and provide suitable opportunities for public education and interpretation;

(4) A final management plan has been approved by NOAA;

(5) An MOU has been signed between the state and NOAA ensuring a long-term commitment by the state to the effective operation and implementation of the area as a National Estuarine Research Reserve;

(6) All MOU's necessary for reserve management (*i.e.*, with relevant Federal, state, and local agencies and/or private organizations) have been signed; and

(7) The coastal state in which the area is located has complied with the requirements of subpart B.

(b) NOAA will determine whether the designation of a National Estuarine Research Reserve in a state with a federally approved coastal zone management program directly affects the coastal zone. If the designation is found to directly affect the coastal zone, NOAA will make a consistency determination pursuant to § 307(c)(1) of the Act, 16 U.S.C. 1456, and 15 CFR part 930, subpart C. See § 921.4(b). The results of this consistency determination will be published in the FEDERAL REG-

ISTER when the notice of designation is published. See § 921.30(c).

(c) NOAA will publish the notice of designation of a National Estuarine Research Reserve in the FEDERAL REGISTER. The state shall be responsible for having a similar notice published in the local media.

(d) The term *state control* in § 921.30(a)(3) does not necessarily require that key land and water areas be owned by the state in fee simple. Acquisition of less-than-fee simple interests *e.g.*, conservation easements) and utilization of existing state regulatory measures are encouraged where the state can demonstrate that these interests and measures assure adequate long-term state control consistent with the purposes of the research reserve (see also §§ 921.13(a)(7); 921.21(g)). Should the state later elect to purchase an interest in such lands using NOAA funds, adequate justification as to the need for such acquisition must be provided to NOAA.

§ 921.31 Supplemental acquisition and development awards.

After National Estuarine Research Reserve designation, and as specified in the approved management plan, a coastal state may request a supplemental acquisition and/or development award(s) for acquiring additional property interests identified in the management plan as necessary to strengthen protection of key land and water areas and to enhance long-term protection of the area for research and education, for facility and exhibit construction, for restorative activities identified in the approved management plan, for administrative purposes related to acquisition and/or facility construction and to develop and/or upgrade research, monitoring and education/interpretive programs. Federal financial assistance provided to a National Estuarine Research Reserve for supplemental development costs directly associated with facility construction (*i.e.*, major construction activities) may not exceed 70 percent of the total project cost, except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100

§ 921.32

percent of the costs. NOAA must make a specific determination that the construction activity will not be detrimental to the environment. Acquisition awards for the acquisition of lands or waters, or interests therein, for any one reserve may not exceed an amount equal to 50 percent of the costs of the lands, waters, and interests therein of \$5,000,000, whichever amount is less, except when the financial assistance is provided from amounts recovered as result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of all actual costs of activities carried out with this assistance, as long as such funds are available. In the case of a biogeographic region (see appendix I) shared by two or more states, each state is eligible independently for Federal financial assistance to establish a separate National Estuarine Research Reserve within their respective portion of the shared biogeographic region. Application procedures are specified in subpart I. Land acquisition must follow the procedures specified in §§921.13(a)(7), 921.21(e) and (f) and 921.81.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12540, Mar. 17, 1997; 63 FR 26717, May 14, 1998]

§921.32 Operation and management: Implementation of the management plan.

(a) After the Reserve is formally designated, a coastal state is eligible to receive Federal funds to assist the state in the operation and management of the Reserve including the management of research, monitoring, education, and interpretive programs. The purpose of this Federally funded operation and management phase is to implement the approved final management plan and to take the necessary steps to ensure the continued effective operation of the Reserve.

(b) State operation and management of the Reserves shall be consistent with the mission, and shall further the goals of the National Estuarine Research Reserve program (see §921.1).

(c) Federal funds are available for the operation and management of the Reserve. Federal funds provided pursuant to this section may not exceed 70 percent of the total cost of operating and

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managing the Reserve for any one year, except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs. In the case of a biogeographic region (see Appendix I) shared by two or more states, each state is eligible for Federal financial assistance to establish a separate Reserve within their respective portion of the shared biogeographic region (see §921.10).

(d) Operation and management funds are subject to the following limitations:

(1) Eligible coastal state agencies may apply for up to the maximum share available per Reserve for that fiscal year. Share amounts will be announced annually by letter from the Sanctuary and Reserves Division to all participating states. This letter will be provided as soon as practicable following approval of the Federal budget for that fiscal year.

(2) No more than ten percent of the total amount (state and Federal shares) of each operation and management award may be used for construction-type activities.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12541, Mar. 17, 1997]

§921.33 Boundary changes, amendments to the management plan, and addition of multiple-site components.

(a) Changes in the boundary of a Reserve and major changes to the final management plan, including state laws or regulations promulgated specifically for the Reserve, may be made only after written approval by NOAA. NOAA may require public notice, including notice in the FEDERAL REGISTER and an opportunity for public comment before approving a boundary or management plan change. Changes in the boundary of a Reserve involving the acquisition of properties not listed in the management plan or final EIS require public notice and the opportunity for comment; in certain cases, a categorical exclusion, an environmental assessment and possibly an environmental impact statement may be required.

NOAA will place a notice in the FEDERAL REGISTER of any proposed changes in Reserve boundaries or proposed major changes to the final management plan. The state shall be responsible for publishing an equivalent notice in the local media. See also requirements of §§921.4(b) and 921.13(a)(11).

(b) As discussed in §921.10(b), a state may choose to develop a multiple-site National Estuarine Research Reserve after the initial acquisition and development award for a single site has been made. NOAA will publish notice of the proposed new site including an invitation for comments from the public in the FEDERAL REGISTER. The state shall be responsible for publishing an equivalent notice in the local newspaper(s). An EIS, if required, shall be prepared in accordance with section §921.13 and shall include an administrative framework for the multiple-site Reserve and a description of the complementary research and educational programs within the Reserve. If NOAA determines, based on the scope of the project and the issues associated with the additional site(s), that an environmental assessment is sufficient to establish a multiple-site Reserve, then the state shall develop a revised management plan which, concerning the additional component, incorporates each of the elements described in §921.13(a). The revised management plan shall address goals and objectives for all components of the multi-site Reserve and the additional component's relationship to the original site(s).

(c) The state shall revise the management plan for a Reserve at least every five years, or more often if necessary. Management plan revisions are subject to (a) above.

(d) NOAA will approve boundary changes, amendments to management plans, or the addition of multiple-site components, by notice in the FEDERAL REGISTER. If necessary NOAA will revise the designation document (findings) for the site.

Subpart E—Ongoing Oversight, Performance Evaluation and Withdrawal of Designation

§921.40 Ongoing oversight and evaluations of designated National Estuarine Research Reserves.

(a) The Sanctuaries and Reserve Division shall conduct, in accordance with section 312 of the Act and procedures set forth in 15 CFR part 928, ongoing oversight and evaluations of Reserves. Interim sanctions may be imposed in accordance with regulations promulgated under 15 CFR part 928.

(b) The Assistant Administrator may consider the following indicators of non-adherence in determining whether to invoke interim sanctions:

(1) Inadequate implementation of required staff roles in administration, research, education/interpretation, and surveillance and enforcement. Indicators of inadequate implementation could include: No Reserve Manager, or no staff or insufficient staff to carry out the required functions.

(2) Inadequate implementation of the required research plan, including the monitoring design. Indicators of inadequate implementation could include: Not carrying out research or monitoring that is required by the plan, or carrying out research or monitoring that is inconsistent with the plan.

(3) Inadequate implementation of the required education/interpretation plan. Indicators of inadequate implementation could include: Not carrying out education or interpretation that is required by the plan, or carrying out education/interpretation that is inconsistent with the plan.

(4) Inadequate implementation of public access to the Reserve. Indicators of inadequate implementation of public access could include: Not providing necessary access, giving full consideration to the need to keep some areas off limits to the public in order to protect fragile resources.

(5) Inadequate implementation of facility development plan. Indicators of inadequate implementation could include: Not taking action to propose and budget for necessary facilities, or not undertaking necessary construction in a timely manner when funds are available.

(6) Inadequate implementation of acquisition plan. Indicators of inadequate implementation could include: Not pursuing an aggressive acquisition program with all available funds for that purpose, not requesting promptly additional funds when necessary, and evidence that adequate long-term state control has not been established over some core or buffer areas, thus jeopardizing the ability to protect the Reserve site and resources from offsite impacts.

(7) Inadequate implementation of Reserve protection plan. Indicators of inadequate implementation could include: Evidence of non-compliance with Reserve restrictions, insufficient surveillance and enforcement to assure that restrictions on use of the Reserve are adhered to, or evidence that Reserve resources are being damaged or destroyed as a result of the above.

(8) Failure to carry out the terms of the signed Memorandum of Understanding (MOU) between the state and NOAA, which establishes a long-term state commitment to maintain and manage the Reserve in accordance with section 315 of the Act. Indicators of failure could include: State action to allow incompatible uses of state-controlled lands or waters in the Reserve, failure of the state to bear its fair share of costs associated with long-term operation and management of the Reserve, or failure to initiate timely updates of the MOU when necessary.

§ 921.41 Withdrawal of designation.

The Assistant Administrator may withdraw designation of an estuarine area as a National Estuarine Research Reserve pursuant to and in accordance with the procedures of section 312 and 315 of the Act and regulations promulgated thereunder.

Subpart F—Special Research Projects

§ 921.50 General.

(a) To stimulate high quality research within designated National Estuarine Research Reserves, NOAA may provide financial support for research projects which are consistent with the Estuarine Research Guidelines referenced in § 921.51. Research awards may be awarded under this subpart to

only those designated Reserves with approved final management plans. Although research may be conducted within the immediate watershed of the Reserve, the majority of research activities of any single research project funded under this subpart may be conducted within Reserve boundaries. Funds provided under this subpart are primarily used to support management-related research projects that will enhance scientific understanding of the Reserve ecosystem, provide information needed by Reserve management and coastal management decision-makers, and improve public awareness and understanding of estuarine ecosystems and estuarine management issues. Special research projects may be oriented to specific Reserves; however, research projects that would benefit more than one Reserve in the National Estuarine Research System are encouraged.

(b) Funds provided under this subpart are available on a competitive basis to any coastal state or qualified public or private person. A notice of available funds will be published in the FEDERAL REGISTER. Special research project funds are provided in addition to any other funds available to a coastal state under the Act. Federal funds provided under this subpart may not exceed 70 percent of the total cost of the project, consistent with § 921.81(e)(4) ("allowable costs"), except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12541, Mar. 17, 1997]

§ 921.51 Estuarine research guidelines.

(a) Research within the National Estuarine Research Reserve System shall be conducted in a manner consistent with Estuarine Research Guidelines developed by NOAA.

(b) A summary of the Estuarine Research Guidelines is published in the FEDERAL REGISTER as a part of the notice of available funds discussed in § 921.50(c).

(c) The Estuarine Research Guidelines are reviewed annually by NOAA. This review will include an opportunity

for comment by the estuarine research community.

§921.52 Promotion and coordination of estuarine research.

(a) NOAA will promote and coordinate the use of the National Estuarine Research Reserve System for research purposes.

(b) NOAA will, in conducting or supporting estuarine research other than that authorized under section 315 of the Act, give priority consideration to research that make use of the National Estuarine Research Reserve System.

(c) NOAA will consult with other Federal and state agencies to promote use of one or more research reserves within the National Estuarine Research Reserve System when such agencies conduct estuarine research.

Subpart G—Special Monitoring Projects

§921.60 General.

(a) To provide a systematic basis for developing a high quality estuarine resource and ecosystem information base for National Estuarine Research Reserves and, as a result, for the System, NOAA may provide financial support for basic monitoring programs as part of operations and management under §921.32. Monitoring funds are used to support three major phases of a monitoring program:

- (1) Studies necessary to collect data for a comprehensive site description/characterization;
- (2) Development of a site profile; and
- (3) Formulation and implementation of a monitoring program.

(b) Additional monitoring funds may be available on a competitive basis to the state agency responsible for Reserve management or a qualified public or private person or entity. However, if the applicant is other than the managing entity of a Reserve that applicant must submit as a part of the application a letter from the Reserve manager indicating formal support of the application by the managing entity of the Reserve. Funds provided under this subpart for special monitoring projects are provided in addition to any other funds available to a coastal state under the Act. Federal funds provided

under this subpart may not exceed 70 percent of the total cost of the project, consistent with §921.81(e)(4) ("allowable costs"), except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs.

(c) Monitoring projects funded under this subpart must focus on the resources within the boundaries of the Reserve and must be consistent with the applicable sections of the Estuarine Research Guidelines referenced in §921.51. Portions of the project may occur within the immediate watershed of the Reserve beyond the site boundaries. However, the monitoring proposal must demonstrate why this is necessary for the success of the project.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12541, Mar. 17, 1997]

Subpart H—Special Interpretation and Education Projects

§921.70 General.

(a) To stimulate the development of innovative or creative interpretive and educational projects and materials to enhance public awareness and understanding of estuarine areas, NOAA may fund special interpretive and educational projects in addition to those activities provided for in operations and management under §921.32. Special interpretive and educational awards may be awarded under this subpart to only those designated Reserves with approved final management plans.

(b) Funds provided under this subpart may be available on a competitive basis to any state agency. However, if the applicant is other than the managing entity of a Reserve, that applicant must submit as a part of the application a letter from the Reserve manager indicating formal support of the application by the managing entity of the Reserve. These funds are provided in addition to any other funds available to a coastal state under the Act. Federal funds provided under this subpart may not exceed 70 percent of the total cost of the project, consistent with §921.81(e)(4) ("allowable costs"),

except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs.

(c) Applicants for education/interpretive projects that NOAA determines benefit the entire National Estuarine Research Reserve System may receive Federal assistance of up to 100% of project costs.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12541, Mar. 17, 1997]

Subpart I—General Financial Assistance Provisions

§921.80 Application information.

(a) Only a coastal state may apply for Federal financial assistance awards for preacquisition, acquisition and development, operation and management, and special education and interpretation projects under subpart H. Any coastal state or public or private person may apply for Federal financial assistance awards for special estuarine research or monitoring projects under subpart G. The announcement of opportunities to conduct research in the System appears on an annual basis in the FEDERAL REGISTER. If a state is participating in the national Coastal Zone Management Program, the applicant for an award under section 315 of the Act shall notify the state coastal management agency regarding the application.

(b) An original and two copies of the formal application must be submitted at least 120 working days prior to the proposed beginning of the project to the following address: Sanctuaries and Reserves Division Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration, 1825 Connecticut Avenue, NW., suite 714, Washington, DC 20235. Application for Federal Assistance Standard Form 424 (Non-construction Program) constitutes the formal application for site selection, post-site selection, operation and management, research, and education and interpretive awards. The Application for Federal Financial Assistance Standard Form 424 (Construction Program) constitutes the formal

application for land acquisition and development awards. The application must be accompanied by the information required in subpart B (predesignation), subpart C and §921.31 (acquisition and development), and §921.32 (operation and management) as applicable. Applications for development awards for construction projects, or restorative activities involving construction, must include a preliminary engineering report, a detailed construction plan, a site plan, a budget and categorical exclusion check list or environmental assessment. All applications must contain back up data for budget estimates (Federal and non-Federal shares), and evidence that the application complies with the Executive Order 12372, "Intergovernmental Review of Federal Programs." In addition, applications for acquisition and development awards must contain:

- (1) State Historic Preservation Office comments;
- (2) Written approval from NOAA of the draft management plan for initial acquisition and development award(s); and
- (3) A preliminary engineering report for construction activities.

§921.81 Allowable costs.

(a) Allowable costs will be determined in accordance with applicable OMB Circulars and guidance for Federal financial assistance, the financial assistant agreement, these regulations, and other Department of Commerce and NOAA directives. The term "costs" applies to both the Federal and non-Federal shares.

(b) Costs claimed as charges to the award must be reasonable, beneficial and necessary for the proper and efficient administration of the financial assistance award and must be incurred during the award period.

(c) Costs must not be allocable to or included as a cost of any other Federally-financed program in either the current or a prior award period.

(d) General guidelines for the non-Federal share are contained in Department of Commerce Regulations at 15 CFR part 24 and OMB Circular A-110.

Copies of Circular A-110 can be obtained from the Sanctuaries and Reserves Division; 1825 Connecticut Avenue, NW., suite 714; Washington, DC 20235. The following may be used in satisfying the matching requirement:

(1) *Site selection and post site selection awards.* Cash and in-kind contributions (value of goods and services directly benefiting and specifically identifiable to this part of the project) are allowable. Land may not be used as match.

(2) *Acquisition and development awards.* Cash and in-kind contributions are allowable. In general, the fair market value of lands to be included within the Reserve boundaries and acquired pursuant to the Act, with other than Federal funds, may be used as match. However, the fair market value of real property allowable as match is limited to the fair market value of a real property interest equivalent to, or required to attain, the level of control over such land(s) identified by the state and approved by the Federal Government as that necessary for the protection and management of the National Estuarine Research Reserve. Appraisals must be performed according to Federal appraisal standards as detailed in Department of Commerce regulations at 15 CFR part 24 and the Uniform Relocation Assistance and Real Property Acquisition for Federal land Federally assisted programs in 15 CFR part 11. The fair market value of privately donated land, at the time of donation, as established by an independent appraiser and certified by a responsible official of the state, pursuant to 15 CFR part 11, may also be used as match. Land, including submerged lands already in the state's possession, may be used as match to establish a National Estuarine Research Reserve. The value of match for these state lands will be calculated by determining the value of the benefits foregone by the state, in the use of the land, as a result of new restrictions that may be imposed by Reserve designation. The appraisal of the benefits foregone must be made by an independent appraiser in accordance with Federal appraisal standards pursuant to 15 CFR part 24 and 15 CFR part 11. A state may initially use as match land valued at greater than the Federal share of the acquisition and develop-

ment award. The value in excess of the amount required as match for the initial award may be used to match subsequent supplemental acquisition and development awards for the National Estuarine Research Reserve (see also §921.20). Costs related to land acquisition, such as appraisals, legal fees and surveys, may also be used as match.

(3) *Operation and management awards.* Generally, cash and in-kind contributions (directly benefiting and specifically identifiable to operations and management), except land, are allowable.

(4) *Research, monitoring, education and interpretive awards.* Cash and in-kind contributions (directly benefiting and specifically identifiable to the scope of work), except land, are allowable.

§921.82 Amendments to financial assistance awards.

Actions requiring an amendment to the financial assistance award, such as a request for additional Federal funds, revisions of the approved project budget or original scope of work, or extension of the performance period must be submitted to NOAA on Standard Form 424 and approved in writing.

APPENDIX I TO PART 921— BIOGEOGRAPHIC CLASSIFICATION SCHEME

Acadian

1. Northern of Maine (Eastport to the Sheepscot River.)
2. Southern Gulf of Maine (Sheepscot River to Cape Cod.)

Virginian

3. Southern New England (Cape Cod to Sandy Hook.)
4. Middle Atlantic (Sandy Hook to Cape Hatteras.)
5. Chesapeake Bay.

Carolinian

6. North Carolinas (Cape Hatteras to Santee River.)
7. South Atlantic (Santee River to St. John's River.)
8. East Florida (St. John's River to Cape Canaveral.)

West Indian

9. Caribbean (Cape Canaveral to Ft. Jefferson and south.)
10. West Florida (Ft. Jefferson to Cedar Key.)

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Louisianian

11. Panhandle Coast (Cedar Key to Mobile Bay.)
12. Mississippi Delta (Mobile Bay to Galveston.)
13. Western Gulf (Galveston to Mexican border.)

Californian

14. Southern California (Mexican border to Point Conception.)
15. Central California (Point Conception to Cape Mendocino.)
16. San Francisco Bay.

Columbian

17. Middle Pacific (Cape Mendocino to the Columbia River.)
18. Washington Coast (Columbia River to Vancouver Island.)
19. Puget Sound.

Great Lakes

20. Lake Superior (including St. Mary's River.)

21. Lakes Michigan and Huron (including Straits of Mackinac, St. Clair River, and Lake St. Clair.)

22. Lake Erie (including Detroit River and Niagara Falls.)

23. Lake Ontario (including St. Lawrence River.)

Fjord

24. Southern Alaska (Prince of Wales Island to Cook Inlet.)

25. Aleutian Island (Cook Inlet Bristol Bay.)

Sub-Arctic

26. Northern Alaska (Bristol Bay to Demarcation Point.)

Insular

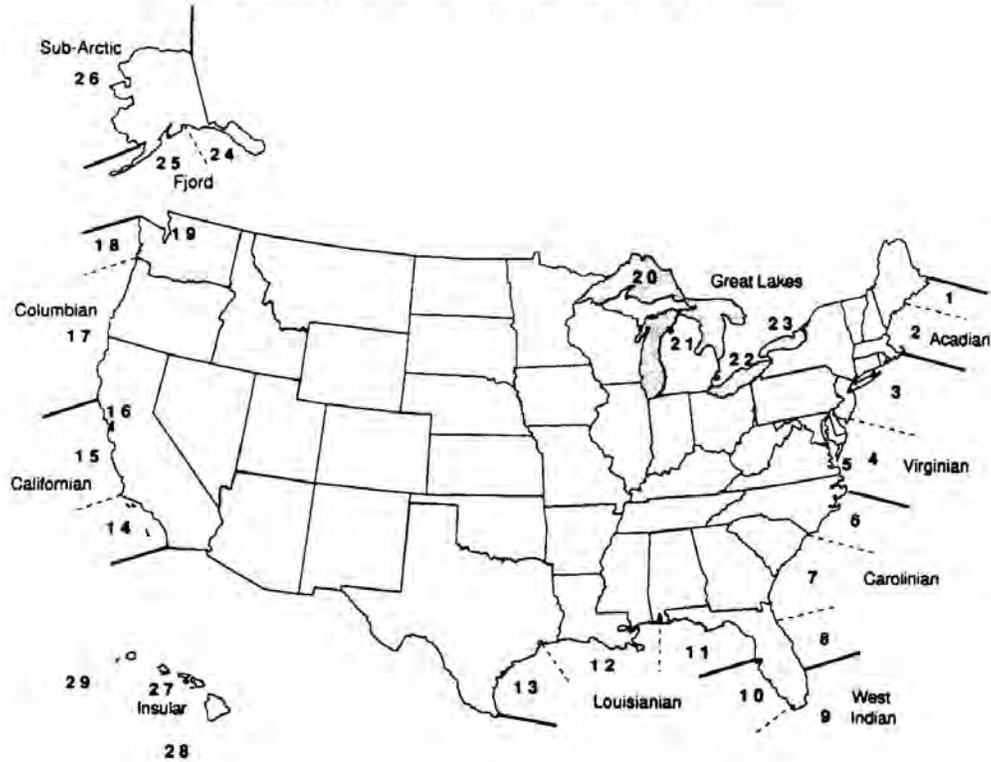
27. Hawaiian Islands.

28. Western Pacific Island.

29. Eastern Pacific Island.

FIGURE 1

**National Estuarine Research Reserve System
Biogeographic Regions of the United States**



APPENDIX II TO PART 921—TYPOLOGY OF NATIONAL ESTUARINE RESEARCH RESERVES

This typology system reflects significant differences in estuarine characteristics that are not necessarily related to regional location. The purpose of this type of classification is to maximize ecosystem variety in the selection of national estuarine reserves. Priority will be given to important ecosystem types as yet unrepresented in the reserve system. It should be noted that any one site may represent several ecosystem types or physical characteristics.

Class I—Ecosystem Types

Group I—Shorelands

A. Maritime Forest Woodland. That have developed under the influence of salt spray. It can be found on coastal uplands or recent features such as barrier islands and beaches,

and may be divided into the following biomes:

1. Northern coniferous forest biome: This is an area of predominantly evergreens such as the sitka spruce (*Picea*), grand fir (*Abies*), and white cedar (*Thuja*), with poor development of the shrub and herb layer, but high annual productivity and pronounced seasonal periodicity.

2. Moist temperate (Mesothermal) coniferous forest biome: Found along the west coast of North America from California to Alaska, this area is dominated by conifers, has relatively small seasonal range, high humidity with rainfall ranging from 30 to 150 inches, and a well-developed understory of vegetation with an abundance of mosses and other moisture-tolerant plants.

3. Temperate deciduous forest biome: This biome is characterized by abundant, evenly distributed rainfall, moderate temperatures which exhibit a distinct seasonal pattern,

well-developed soil biota and herb and shrub layers, and numerous plants which produce pulpy fruits and nuts. A distinct subdivision of this biome is the pine edible forest of the southeastern coastal plain, in which only a small portion of the area is occupied by climax vegetation, although it has large areas covered by edaphic climax pines.

4. Broad-leaved evergreen subtropical forest biome: The main characteristic of this biome is high moisture with less pronounced differences between winter and summer. Examples are the hammocks of Florida and the live oak forests of the Gulf and South Atlantic coasts. Floral dominants include pines, magnolias, bays, hollies, wild tamarine, strangler fig, gumbo limbo, and palms.

B. Coast shrublands. This is a transitional area between the coastal grasslands and woodlands and is characterized by woody species with multiple stems and a few centimeters to several meters above the ground developing under the influence of salt spray and occasional sand burial. This includes thickets, scrub, scrub savanna, heathlands, and coastal chaparral. There is a great variety of shrubland vegetation exhibiting regional specificity:

1. Northern areas: Characterized by *Hudsonia*, various erinaceous species, and thickets of *Myrica*, *Prunus*, and *Rosa*.

2. Southeast areas: Floral dominants include *Myrica*, *Baccharis*, and *Ilex*.

3. Western areas: *Adenostoma*, *arcotyphlos*, and *eucalyptus* are the dominant floral species.

C. Coastal grasslands. This area, which possesses sand dunes and coastal flats, has low rainfall (10 to 30 inches per year) and large amounts of humus in the soil. Ecological succession is slow, resulting in the presence of a number of seral stages of community development. Dominant vegetation includes mid-grasses (5 to 8 feet tall), such as *Spartina*, and trees such as willow (*Salix* sp.), cherry (*Prunus* sp.), and cottonwood (*Populus deltoides*.) This area is divided into four regions with the following typical strand vegetation:

1. Arctic/Boreal: *Elymus*;

2. Northeast/West: *Ammophila*;

3. Southeast Gulf: *Uniola*; and

4. Mid-Atlantic/Gulf: *Spartina patens*.

D. Coastal tundra. This ecosystem, which is found along the Arctic and Boreal coasts of North America, is characterized by low temperatures, a short growing season, and some permafrost, producing a low, treeless mat community made up of mosses, lichens, heath, shrubs, grasses, sedges, rushes, and herbaceous and dwarf woody plants. Common species include arctic/alpine plants such as *Empetrum nigrum* and *Betula nana*, the lichens *Cetraria* and *Cladonia*, and herbaceous plants such as *Potentilla tridentata* and *Rubus chamaemorus*. Common species

on the coastal beach ridges of the high arctic desert include *Bryas intergrifolia* and *Saxifrage oppositifolia*. This area can be divided into two main subdivisions:

1. Low tundra: Characterized by a thick, spongy mat of living and undecayed vegetation, often with water and dotted with ponds when not frozen; and

2. High Tundra: A bare area except for a scanty growth of lichens and grasses, with underlying ice wedges forming raised polygonal areas.

E. Coastal cliffs. This ecosystem is an important nesting site for many sea and shore birds. It consists of communities of herbaceous, graminoid, or low woody plants (shrubs, heath, etc.) on the top or along rocky faces exposed to salt spray. There is a diversity of plant species including mosses, lichens, liverworts, and "higher" plant representatives.

GROUP II—TRANSITION AREAS

A. Coastal marshes. These are wetland areas dominated by grasses (*Poacea*), sedges (*Cyperaceae*), rushes (*Juncaceae*), cattails (*Typhaceae*), and other graminoid species and is subject to periodic flooding by either salt or freshwater. This ecosystem may be subdivided into: (a) Tidal, which is periodically flooded by either salt or brackish water; (b) nontidal (freshwater); or (c) tidal freshwater. These are essential habitats for many important estuarine species of fish and invertebrates as well as shorebirds and waterfowl and serve important roles in shore stabilization, flood control, water purification, and nutrient transport and storage.

B. Coastal swamps. These are wet lowland areas that support mosses and shrubs together with large trees such as cypress or gum.

C. Coastal mangroves. This ecosystem experiences regular flooding on either a daily, monthly, or seasonal basis, has low wave action, and is dominated by a variety of salt-tolerant trees, such as the red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia Nitida*), and the white mangrove (*Laguncularia racemosa*.) It is also an important habitat for large populations of fish, invertebrates, and birds. This type of ecosystem can be found from central Florida to extreme south Texas to the islands of the Western Pacific.

D. Intertidal beaches. This ecosystem has a distinct biota of microscopic animals, bacteria, and unicellular algae along with macroscopic crustaceans, mollusks, and worms with a detritus-based nutrient cycle. This area also includes the driftline communities found at high tide levels on the beach. The dominant organisms in this ecosystem include crustaceans such as the mole crab (*Emerita*), amphipods (*Gammaridae*), ghost crabs (*Ocypode*), and bivalve mollusks such

as the coquina (*Donax*) and surf clams (*Spisula* and *Mactra*.)

E. Intertidal mud and sand flats. These areas are composed of unconsolidated, high organic content sediments that function as a short-term storage area for nutrients and organic carbons. Macrophytes are nearly absent in this ecosystem, although it may be heavily colonized by benthic diatoms, dinoflagellates, filamentous blue-green and green algae, and chaemosynthetic purple sulfur bacteria. This system may support a considerable population of gastropods, bivalves, and polychaetes, and may serve as a feeding area for a variety of fish and wading birds. In sand, the dominant fauna include the wedge shell *Donax*, the scallop *Pecten*, tellin shells *Tellina*, the heart urchin *Echinocardium*, the lug worm *Arenicola*, sand dollar *Dendraster*, and the sea pansy *Renilla*. In mud, faunal dominants adapted to low oxygen levels include the terebellid *Amphitrite*, the boring clam *Playdon*, the deep sea scallop *Eplacopecten*, the Quahog *Mercenaria*, the echiurid worm *Urechis*, the mud snail *Nassarius*, and the sea cucumber *Thyone*.

F. Intertidal algal beds. These are hard substrates along the marine edge that are dominated by macroscopic algae, usually thalloid, but also filamentous or unicellular in growth form. This also includes the rocky coast tidepools that fall within the intertidal zone. Dominant fauna of these areas are barnacles, mussels, periwinkles, anemones, and chitons. Three regions are apparent:

1. Northern latitude rocky shores: It is in this region that the community structure is best developed. The dominant algal species include *Chondrus* at the low tide level, *Fucus* and *Ascophyllum* at the mid-tidal level, and *Laminaria* and other kelp-like algae just beyond the intertidal, although they can be exposed at extremely low tides or found in very deep tidepools.

2. Southern latitudes: The communities in this region are reduced in comparison to those of the northern latitudes and possess algae consisting mostly of single-celled or filamentous green, blue-green, and red algae, and small thalloid brown algae.

3. Tropical and subtropical latitudes: The intertidal in this region is very reduced and contains numerous calcareous algae such as *Porolithon* and *Lithothamnion*, as well as green algae with calcareous particles such as *Halimeda*, and numerous other green, red, and brown algae.

GROUP III—SUBMERGED BOTTOMS

A. Subtidal hardbottoms. This system is characterized by a consolidated layer of solid rock or large pieces of rock (neither of biotic origin) and is found in association with geomorphological features such as submarine canyons and fjords and is usually covered with assemblages of sponges, sea fans, bivalves, hard corals, tunicates, and

other attached organisms. A significant feature of estuaries in many parts of the world is the oyster reef, a type of subtidal hardbottom. Composed of assemblages of organisms (usually bivalves), it is usually found near an estuary's mouth in a zone of moderate wave action, salt content, and turbidity. If light levels are sufficient, a covering of microscopic and attached macroscopic algae, such as kelp, may also be found.

B. Subtidal softbottoms. Major characteristics of this ecosystem are an unconsolidated layer of fine particles of silt, sand, clay, and gravel, high hydrogen sulfide levels, and anaerobic conditions often existing below the surface. Macrophytes are either sparse or absent, although a layer of benthic microalgae may be present if light levels are sufficient. The faunal community is dominated by a diverse population of deposit feeders including polychaetes, bivalves, and burrowing crustaceans.

C. Subtidal plants. This system is found in relatively shallow water (less than 8 to 10 meters) below mean low tide. It is an area of extremely high primary production that provides food and refuge for a diversity of faunal groups, especially juvenile and adult fish, and in some regions, manatees and sea turtles. Along the North Atlantic and Pacific coasts, the seagrass *Zostera marina* predominates. In the South Atlantic and Gulf coast areas, *Thalassia* and *Diplanthera* predominate. The grasses in both areas support a number of epiphytic organisms.

Class II—Physical Characteristics

GROUP I—GEOLOGIC

A. Basin type. Coastal water basins occur in a variety of shapes, sizes, depths, and appearances. The eight basic types discussed below will cover most of the cases:

1. Exposed coast: Solid rock formations or heavy sand deposits characterize exposed ocean shore fronts, which are subject to the full force of ocean storms. The sand beaches are very resilient, although the dunes lying just behind the beaches are fragile and easily damaged. The dunes serve as a sand storage area making them chief stabilizers of the ocean shoreline.

2. Sheltered coast: Sand or coral barriers, built up by natural forces, provide sheltered areas inside a bar or reef where the ecosystem takes on many characteristics of confined waters—abundant marine grasses, shellfish, and juvenile fish. Water movement is reduced, with the consequent effects pollution being more severe in this area than in exposed coastal areas.

3. Bay: Bays are larger confined bodies of water that are open to the sea and receive strong tidal flow. When stratification is pronounced the flushing action is augmented by

river discharge. Bays vary in size and in type of shorefront.

4. Embayment: A confined coastal water body with narrow, restricted inlets and with a significant freshwater inflow can be classified as an embayment. These areas have more restricted inlets than bays, are usually smaller and shallower, have low tidal action, and are subject to sedimentation.

5. Tidal river: The lower reach of a coastal river is referred to as a tidal river. The coastal water segment extends from the sea or estuary into which the river discharges to a point as far upstream as there is significant salt content in the water, forming a salt front. A combination of tidal action and freshwater outflow makes tidal rivers well-flushed. The tidal river basin may be a simple channel or a complex of tributaries, small associated embayments, marshfronts, tidal flats, and a variety of others.

6. Lagoon: Lagoons are confined coastal bodies of water with restricted inlets to the sea and without significant freshwater inflow. Water circulation is limited, resulting in a poorly flushed, relatively stagnant body of water. Sedimentation is rapid with a great potential for basin shoaling. Shores are often gently sloping and marshy.

7. Perched coastal wetlands: Unique to Pacific islands, this wetland type found above sea level in volcanic crater remnants forms as a result of poor drainage characteristics of the crater rather than from sedimentation. Floral assemblages exhibit distinct zonation while the faunal constituents may include freshwater, brackish, and/or marine species. EXAMPLE: Aunu's Island, American Samoa.

8. Anchialine systems: These small coastal exposures of brackish water form in lava depressions or elevated fossil reefs have only a subsurface connection in the ocean, but show tidal fluctuations. Differing from true estuaries in having no surface continuity with streams or ocean, this system is characterized by a distinct biotic community dominated by benthic algae such as *Rhizoclonium*, the mineral encrusting *Schizothrix*, and the vascular plant *Ruppia maritima*. Characteristic fauna which exhibit a high degree of endemism, include the mollusks *Theosoxus neglectus* and *Tecariosus*. Although found throughout the world, the high islands of the Pacific are the only areas within the U.S. where this system can be found.

B. Basin structure. Estuary basins may result from the drowning of a river valley (coastal plains estuary), the drowning of a glacial valley (fjord), the occurrence of an offshore barrier (bar-bounded estuary), some tectonic process (tectonic estuary), or volcanic activity (volcanic estuary).

1. Coastal plains estuary: Where a drowned valley consists mainly of a single channel, the form of the basin is fairly regular form-

ing a simple coastal plains estuary. When a channel is flooded with numerous tributaries an irregular estuary results. Many estuaries of the eastern United States are of this type.

2. Fjord: Estuaries that form in elongated steep headlands that alternate with deep U-shaped valleys resulting from glacial scouring are called fjords. They generally possess rocky floors or very thin veneers of sediment, with deposition generally being restricted to the head where the main river enters. Compared to total fjord volume river discharge is small. But many fjords have restricted tidal ranges at their mouths due to sills, or upreaching sections of the bottom which limit free movement of water, often making river flow large with respect to the tidal prism. The deepest portions are in the upstream reaches, where maximum depths can range from 800m to 1200m while sill depths usually range from 40m to 150m.

3. Bar-bounded estuary: These result from the development of an offshore barrier such as a beach strand, a line of barrier islands, reef formations a line of moraine debris, or the subsiding remnants of a deltaic lobe. The basin is often partially exposed at low tide and is enclosed by a chain of offshore bars of barrier islands broken at intervals by inlets. These bars may be either deposited offshore or may be coastal dunes that have become isolated by recent sea level rises.

4. Tectonic estuary: These are coastal indentures that have formed through tectonic processes such as slippage along a fault line (San Francisco Bay), folding or movement of the earth's bedrock often with a large inflow of freshwater.

5. Volcanic estuary: These coastal bodies of open water, a result of volcanic processes are depressions or craters that have direct and/or subsurface connections with the ocean and may or may not have surface continuity with streams. These formations are unique to island areas of volcanic origin.

C. Inlet type. Inlets in various forms are an integral part of the estuarine environment as they regulate to a certain extent, the velocity and magnitude of tidal exchange, the degree of mixing, and volume of discharge to the sea.

1. Unrestricted: An estuary with a wide unrestricted inlet typically has slow currents, no significant turbulence, and receives the full effect of ocean waves and local disturbances which serve to modify the shoreline. These estuaries are partially mixed, as the open mouth permits the incursion of marine waters to considerable distances upstream, depending on the tidal amplitude and stream gradient.

2. Restricted: Restrictions of estuaries can exist in many forms: Bars, barrier islands, spits, sills, and more. Restricted inlets result in decreased circulation, more pronounced longitudinal and vertical salinity gradients, and more rapid sedimentation. However, if

the estuary mouth is restricted by depositional features or land closures, the incoming tide may be held back until it suddenly breaks forth into the basin as a tidal wave, or bore. Such currents exert profound effects on the nature of the substrate, turbidity, and biota of the estuary.

3. Permanent: Permanent inlets are usually opposite the mouths of major rivers and permit river water to flow into the sea.

4. Temporary (Intermittent): Temporary inlets are formed by storms and frequently shift position, depending on tidal flow, the depth of the sea, and sound waters, the frequency of storms, and the amount of littoral transport.

D. Bottom composition. The bottom composition of estuaries attests to the vigorous, rapid, and complex sedimentation processes characteristic of most coastal regions with low relief. Sediments are derived through the hydrologic processes of erosion, transport, and deposition carried on by the sea and the stream.

1. Sand: Near estuary mouths, where the predominating forces of the sea build spits or other depositional features, the shore and substrates of the estuary are sandy. The bottom sediments in this area are usually coarse, with a gradation toward finer particles in the head region and other zones of reduced flow, fine silty sands are deposited. Sand deposition occurs only in wider or deeper regions where velocity is reduced.

2. Mud: At the base level of a stream near its mouth, the bottom is typically composed of loose muds, silts, and organic detritus as a result of erosion and transport from the upper stream reaches and organic decomposition. Just inside the estuary entrance, the bottom contains considerable quantities of sand and mud, which support a rich fauna. Mud flats, commonly built up in estuarine basins, are composed of loose, coarse, and fine mud and sand, often dividing the original channel.

3. Rock: Rocks usually occur in areas where the stream runs rapidly over a steep gradient with its coarse materials being derived from the higher elevations where the stream slope is greater. The larger fragments are usually found in shallow areas near the stream mouth.

4. Oyster shell: Throughout a major portion of the world, the oyster reef is one of the most significant features of estuaries, usually being found near the mouth of the estuary in a zone of moderate wave action, salt content, and turbidity. It is often a major factor in modifying estuarine current systems and sedimentation, and may occur as an elongated island or peninsula oriented across the main current, or may develop parallel to the direction of the current.

GROUP II—HYDROGRAPHIC

A. Circulation. Circulation patterns are the result of combined influences of freshwater inflow, tidal action, wind and oceanic forces, and serve many functions: Nutrient transport, plankton dispersal, ecosystem flushing, salinity control, water mixing, and more.

1. Stratified: This is typical of estuaries with a strong freshwater inflow and is commonly found in bays formed from "drowned" river valleys, fjords, and other deep basins. There is a net movement of freshwater outward at the top layer and saltwater at the bottom layer, resulting in a net outward transport of surface organisms and net inward transport of bottom organisms.

2. Non-stratified: Estuaries of this type are found where water movement is sluggish and flushing rate is low, although there may be sufficient circulation to provide the basis for a high carrying capacity. This is common to shallow embayments and bays lacking a good supply of freshwater from land drainage.

3. Lagoonal: An estuary of this type is characterized by low rates of water movement resulting from a lack of significant freshwater inflow and a lack of strong tidal exchange because of the typically narrow inlet connecting the lagoon to the sea. Circulation whose major driving force is wind, is the major limiting factor in biological productivity within lagoons.

B. Tides. This is the most important ecological factor in an estuary as it affects water exchange and its vertical range determines the extent of tidal flats which may be exposed and submerged with each tidal cycle. Tidal action against the volume of river water discharged into an estuary results in a complex system whose properties vary according to estuary structure as well as the magnitude of river flow and tidal range. Tides are usually described in terms of the cycle and their relative heights. In the United States, tide height is reckoned on the basis of average low tide, which is referred to as datum. The tides, although complex, fall into three main categories:

1. Diurnal: This refers to a daily change in water level that can be observed along the shoreline. There is one high tide and one low tide per day.

2. Semidiurnal: This refers to a twice daily rise and fall in water that can be observed along the shoreline.

3. Wind/Storm tides: This refers to fluctuations in water elevation to wind and storm events, where influence of lunar tides is less.

C. Freshwater. According to nearly all the definitions advanced, it is inherent that all estuaries need freshwater, which is drained from the land and measurably dilutes seawater to create a brackish condition. Freshwater enters an estuary as runoff from the

land either from a surface and/or subsurface source.

1. Surface water: This is water flowing over the ground in the form of streams. Local variation in runoff is dependent upon the nature of the soil (porosity and solubility), degree of surface slope, vegetational type and development, local climatic conditions, and volume and intensity of precipitation.

2. Subsurface water: This refers to the precipitation that has been absorbed by the soil and stored below the surface. The distribution of subsurface water depends on local climate, topography, and the porosity and permeability of the underlying soils and rocks. There are two main subtypes of surface water:

a. Vadose water: This is water in the soil above the water table. Its volume with respect to the soil is subject to considerable fluctuation.

b. Groundwater: This is water contained in the rocks below the water table, is usually of more uniform volume than vadose water, and generally follows the topographic relief of the land being high hills and sloping into valleys.

GROUP III—CHEMICAL

A. *Salinity*. This reflects a complex mixture of salts, the most abundant being sodium chloride, and is a very critical factor in the distribution and maintenance of many estuarine organisms. Based on salinity, there are two basic estuarine types and eight different salinity zones (expressed in parts per thousand-ppt.)

1. Positive estuary: This is an estuary in which the freshwater influx is sufficient to maintain mixing, resulting in a pattern of increasing salinity toward the estuary mouth. It is characterized by low oxygen concentration in the deeper waters and considerable organic content in bottom sediments.

2. Negative estuary: This is found in particularly arid regions, where estuary evaporation may exceed freshwater inflow, resulting in increased salinity in the upper part of the basin, especially if the estuary mouth is restricted so that tidal flow is inhibited. These are typically very salty (hyperhaline), moderately oxygenated at depth, and possess bottom sediments that are poor in organic content.

3. Salinity zones (expressed in ppt):

- a. Hyperhaline—greater than 40 ppt.
- b. Euhaline—40 ppt to 30 ppt.
- c. Mixhaline—30 ppt to 0.5 ppt.
 - (1) Mixoeuhaline—greater than 30 ppt but less than the adjacent euhaline sea.
 - (2) Polyhaline—30 ppt to 18 ppt.
 - (3) Mesohaline—18 ppt to 5 ppt.
 - (4) Oligohaline—5 ppt to 0.5 ppt.
- d. Limnetic: Less than 0.5 ppt.

B. *pH Regime*: This is indicative of the mineral richness of estuarine waters and falls into three main categories:

1. Acid: Waters with a pH of less than 5.5.
2. Circumneutral: A condition where the pH ranges from 5.5 to 7.4.
3. Alkaline: Waters with a pH greater than 7.4.

PART 922—NATIONAL MARINE SANCTUARY PROGRAM REGULATIONS

Subpart A—General

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- 922.1 Applicability of regulations.
- 922.2 Mission, goals, and special policies.
- 922.3 Definitions.
- 922.4 Effect of National Marine Sanctuary designation.

Subpart B—Site Evaluation List (SEL)

- 922.10 General.

Subpart C—Designation of National Marine Sanctuaries

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- 922.21 Selection of active candidates.
- 922.22 Development of designation materials.
- 922.23 Coordination with States and other Federal agencies.
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- 922.25 Designation determination and findings.

Subpart D—Management Plan Development and Implementation

- 922.30 General.
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Subpart E—Regulations of General Applicability

- 922.40 Purpose.
- 922.41 Boundaries.
- 922.42 Allowed activities.
- 922.43 Prohibited or otherwise regulated activities.
- 922.44 Emergency regulations.
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- 922.47 Pre-existing authorizations or rights and certifications of pre-existing authorizations or rights.
- 922.48 National Marine Sanctuary permits—application procedures and issuance criteria.

B.2 / State Legal Requirements

Acquisition and Restoration Council (ARC)/DSL Requirements for a

Conceptual State Lands Management Plan: <http://www.dep.state.fl.us/lands/oes/ARC/Mgt%20Plan/SLMP.pdf>

B.3 / Aquatic Preserve Resolution

WHEREAS, the State of Florida, by virtue of its sovereignty, is the owner of the beds of all navigable waters, salt and fresh, lying within its territory, with certain minor exceptions, and is also the owner of certain other lands derived from various sources; and

WHEREAS, title to these sovereignty and certain other lands has been vested by the Florida Legislature in the State of Florida Board of Trustees of the Internal Improvement Trust Fund, to be held, protected and managed for the long-range benefit of the people of Florida; and

WHEREAS, the State of Florida Board of Trustees of the Internal Improvement Trust Fund, as a part of its overall management program for Florida's state-owned lands, does desire to insure the perpetual protection, preservation and public enjoyment of certain specific areas of exceptional quality and value by setting aside forever these certain areas as aquatic preserves or sanctuaries; and

WHEREAS, the ad hoc Florida Inter-Agency Advisory Committee on Submerged Land Management has selected through careful study and deliberation a number of specific areas of state-owned land having exceptional biological, aesthetic and scientific value, and has recommended to the State of Florida Board of Trustees of the Internal Improvement Trust Fund that these selected areas be officially recognized and established as the initial elements of a statewide system of aquatic preserves for Florida;

NOW, THEREFORE, BE IT RESOLVED by the State of Florida Board of Trustees of the Internal Improvement Trust Fund:

THAT it does hereby establish a statewide system of aquatic preserves as a means of protecting and preserving in perpetuity certain specially selected areas of state-owned land: and

THAT specifically described, individual areas of state-owned land may from time to time be established as aquatic preserves and included in the statewide system of aquatic preserves by separate resolution of the State of Florida Board of Trustees of the Internal Improvement Trust Fund; and

THAT the statewide system of aquatic preserves and all individual aquatic preserves established hereunder shall be administered and managed, either by the said State of Florida Board of Trustees of the Internal Improvement Trust Fund or its designee as may be specifically provided for in the establishing resolution for each individual aquatic preserve, in accordance with the following management policies and criteria:

- (1) An aquatic preserve is intended to set aside an exceptional area of state-owned land and its associated waters for preservation essentially in their natural or existing condition by reasonable regulation of all human activity which might have an effect on the area.
- (2) An aquatic preserve shall include only lands or water bottoms owned by the State of Florida, and such private lands or water bottoms as may be specifically authorized for inclusion by appropriate instrument from the owner. Any included lands or water bottoms to which a private ownership claim might subsequently be proved shall upon adjudication of private ownership be automatically excluded from the preserve, although such exclusion shall not preclude the State from attempting to negotiate an arrangement with the owner by which such lands or water bottoms might be again included within the preserve.
- (3) No alteration of physical conditions within an aquatic preserve shall be permitted except: (a) minimum dredging and spoiling for authorized public navigation projects, or (b) other approved activity designed to enhance the quality or utility of the preserve itself. It is inherent in the concept of the aquatic preserve that, other than as contemplated above, there be: no dredging and filling to create land, no drilling of oil wells or excavation for shell or minerals, and no erection of structures on stilts or otherwise unless associated with authorized activity, within the confines of a preserve - to the extent these activities can be lawfully prevented.
- (4) Specifically, there shall be no bulkhead lines set within an aquatic preserve. When the boundary of a preserve is intended to be the line of mean high water along a particular shoreline, any bulkhead line subsequently set for that shoreline will also be at the line of mean high water.
- (5) All human activity within an aquatic preserve shall be subject to reasonable rules and regulations promulgated and enforced by the State of Florida Board of Trustees of the Internal Improvement Trust Fund and/or any other specifically designated managing agency. Such rules and regulations shall not interfere unduly with lawful and traditional public uses of the area, such as fishing (both sport and commercial), hunting, boating, swimming and the like.
- (6) Neither the establishment nor the management of an aquatic preserve shall infringe upon the lawful and traditional riparian rights of private property owners adjacent to a preserve. In furtherance of these rights, reasonable improvement for ingress and egress, mosquito control, shore protection and similar purposes may be permitted by

the State of Florida Board of Trustees of the Internal Improvement Trust Fund and other jurisdictional agencies, after review and formal concurrence by any specifically designated managing agency for the preserve in question.

(7) Other uses of an aquatic preserve, or human activity within a preserve, although not originally contemplated, may be permitted by the State of Florida Board of Trustees of the Internal Improvement Trust Fund and other jurisdictional agencies, but only after a formal finding of compatibility made by the said Trustees on the advice of any specifically designated managing agency for the preserve in question.

IN TESTIMONY WHEREOF, the Trustees for and on behalf of the State of Florida Board of Trustees of the Internal Improvement Trust Fund have hereunto subscribed their names and have caused the official seal of said State of Florida Board of Trustees of the Internal Improvement Trust Fund to be hereunto affixed, in the City of Tallahassee, Florida, on this the 24th day of November A. D. 1969.

CLAUDE R. KIRK, JR, Governor TOM ADAMS, Secretary of State

EARL FAIRCLOTH, Attorney General FRED O. DICKINSON, JR., Comptroller

BROWARD WILLIAMS, Treasurer FLOYD T. CHRISTIAN, Commissioner of Education

DOYLE CONNER, Commissioner of Agriculture

As and Constituting the State of Florida Board of Trustees of the Internal Improvement Trust Fund

B.4 / Florida Statutes (F.S.)

Florida Statutes, Chapter 253: State Lands

http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_StatuteandURL=Ch0253/titl0253.htm

Florida Statutes, Chapter 258: State Parks and Preserves

http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_StatuteandURL=Ch0258/ch0258.htm

Part II (Aquatic Preserves):

http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_StatuteandURL=Ch0258/part02.htm

Florida Statutes, Chapter 259: Land Acquisitions for Conservation or Recreation

http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_StatuteandURL=Ch0259/titl0259.htm

Florida Statutes, Chapter 370: Saltwater Fisheries

http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_StatuteandURL=Ch0370/titl0370.htm

Florida Statutes, Chapter 372: Wildlife

http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_StatuteandURL=Ch0372/titl0372.htm

Florida Statutes, Chapter 403: Environmental Control

(Statute authorizing DEP to create Outstanding Florida Waters is at 403.061(27))

http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_StatuteandURL=Ch0403/ch0403.htm

B.5 / Florida Administrative Codes (F.A.C.)

Florida Administrative Code, Chapter 18-20: Florida Aquatic Preserves

<http://www.dep.state.fl.us/legal/Rules/shared/18-20.pdf>

Florida Administrative Code, Chapter 18-21: Sovereignty Submerged Lands Management

<http://www.dep.state.fl.us/legal/Rules/shared/18-21.pdf>

Florida Administrative Code, Chapter 18-23: State Buffer Preserves

<http://www.dep.state.fl.us/legal/Rules/shared/18-23.pdf>

Florida Administrative Code, Chapter 62-302: Surface Water Quality Standards

(Rule designating Outstanding Florida Waters is at 62-302.700) <http://www.dep.state.fl.us/legal/Rules/shared/62-302/62-302.pdf>

B.6 / Memorandums of Understanding (MOU)

Memorandum of Understanding between the National Oceanic and Atmospheric Administration and the Florida Department of Environmental Protection

Memorandum of Understanding between the Department of Environmental Protection Division of Marine Resources and the Division of Recreation and Parks

Memorandum of Understanding between the Department of Environmental Protection Division of Marine Resources and the St. Johns River Water Management District

Memorandum of Understanding between the Department of Environmental Protection Division of Marine Resources and the Florida Game and Fresh Water Fish Commission

Memorandum of Understanding between the Department of Environmental Protection Division of Marine Resources and Flagler County

Memorandum of Understanding between the Department of Environmental Protection Division of Marine Resources and the National Park Service

Memorandum of Understanding for the citizens of St. Johns and Flagler counties

Memorandum of Understanding
Between the
National Oceanic and Atmospheric Administration
and the
Florida Department of Environmental Protection
Detailing the State-Federal Roles in the
Management of National Estuarine Research Reserves in Florida

This Memorandum of Understanding (MOU) states the provisions for the cooperative management of three National Estuarine Research Reserves (Reserves or NERRs) in Florida, between the Florida Department of Environmental Protection (DEP) and the National Oceanic and Atmospheric Administration's (NOAA) Office of Ocean and Coastal Resource Management (OCRM). Those Reserves are the Rookery Bay, Apalachicola, and Guana-Tolomato-Matanzas NERRs, located, respectively, near Naples, Apalachicola, and St. Augustine, Florida.

WHEREAS, the Rookery Bay National Estuarine Research Reserve (RBNERR) and the Apalachicola National Estuarine Research Reserve (ANERR) were designated as NERRs in 1978 and 1979, respectively, under the authority of the Coastal Zone Management Act of 1972 (P.L. 96-583) and its amendments of 1976 (P.L. 94-370) and 1980 (P.L. 96-464) for the purpose of creating natural field laboratories in which to gather information by promoting and conducting scientific studies of the natural and human processes occurring along Florida's coastline to: contribute to the science of estuarine ecosystem processes; enhance the quality of environmental education; and provide the technical information essential to effective coastal zone management to ensure the protection of estuarine ecosystems throughout Florida and the United States; and

WHEREAS, the RBNERR and the ANERR have established programs that have been recognized at the state and federal levels for a high level of achievement in accomplishing both state and federal goals of natural resource protection through innovative environmental education, scientific research, and on-site resource management practices; and

WHEREAS, DEP determined that the pristine waters and related coastal habitats of the coastal lagoonal estuarine ecosystem of the Guana, Tolomato, and Matanzas Rivers provide opportunities to study a unique and relatively undisturbed natural estuarine ecosystem as a representative site on Florida's east coast in NOAA's system of biogeographic zoning; and

WHEREAS, DEP finds that the value of the natural and cultural resources of the Guana-Tolomato-Matanzas (GTM) estuary to the citizens of Florida and the United States will benefit from the management of this site as part of the National Estuarine Research Reserve System (NERRS); and

WHEREAS, NOAA has concurred with that finding and pursuant to its authority under 15 U.S.C. 1525 and Section 315 of the Coastal Zone Management Act of 1972, as amended, (CZMA, P.L. 92-583, 16 U.S.C. 1461) and in accordance with the regulations at 15 CFR 921.30, shall designate the GTM National Estuarine Research Reserve (GTMNERR) in Florida; and

WHEREAS, DEP, as the responsible agency of the State of Florida for the management of the ANERR, RBNERR, and the GTMNERR, and NOAA, as the responsible federal agency for the national administration of the NERRS, acknowledge the value of establishing federal-state cooperation in the long-term management of these three Reserves in a manner consistent with the purposes of their designation; and

WHEREAS, the management plans for the three Reserves describe the goals, objectives, plans, administrative structure, and institutional arrangements for each Reserve respectively, including this MOU and others;

NOW THEREFORE, in consideration of the mutual agreements contained herein, DEP and NOAA agree, contingent on the availability of legislative funding from the Florida Legislature and the Congress of the United States, respectively, as follows:

ARTICLE 1: STATE-FEDERAL ROLES IN RESERVE MANAGEMENT

A. DEP Responsibilities in Reserve Management

The DEP shall:

1. be responsible for compliance with federal law and regulations of the NERRS, and goals and objectives of each Reserve's management plan;
2. ensure that each Reserve's management plan and annual work plans are consistent with the provisions of the CZMA;
3. be responsible for the administration and on-site management of each Reserve;
4. assume the responsibility of managing each Reserve with advisory input from each Reserve's respective advisory group and any ad hoc subcommittees that may be established to address scientific research, environmental education, or on-site management;

5. ensure protection of the natural and cultural resources of each Reserve, and ensure enforcement of the provisions of state law, including the rules and regulations of the Florida Coastal Management Program;
6. annually apply for, budget, and allocate funds received for scientific research and environmental monitoring, environmental education, public land acquisition, general program operations, and the construction of Reserve facilities;
7. coordinate and conduct active research and monitoring programs at each Reserve with scientists from a variety of institutions to obtain a better understanding of the ecology of each Reserve's ecosystem for application to the improved manageability of each Reserve, similar coastal ecosystems, and the NERRS;
8. disseminate the information gathered through scientific research to environmental regulators, local school systems, the general public, and any other interested parties;
9. seek state legislative funding for the facilities and staff required to implement the provisions of each Reserve's management plan, such as: field research laboratories; classrooms for environmental education; libraries; administrative offices; interpretive displays; equipment; storage space; and staff to perform the duties related to the management of each Reserve;
10. maintain liaison with local, regional, state, and federal policy makers, regulators, and the general public;
11. seek partnerships for the protection of the natural and cultural resources of each Reserve with residents, commerce, industry, property owners, adjacent land owners, government agencies at the local, state, and federal levels, and any other appropriate parties;
12. provide for public recreational uses that are compatible with natural and cultural resource protection;
13. Respond to NOAA's requests for information and respond to evaluation findings made pursuant to Section 312 of the CZMA.

B. Federal Role in Reserve Operation

The Office of Ocean and Coastal Resource Management will serve to administer the provisions of Section 315 of the CZMA to ensure that each Reserve operates in accordance with the goals of the NERRS and each Reserve's respective management plan. These responsibilities are subject to the availability of appropriated funds. In carrying out its responsibilities, OCRM will:

1. evaluate the functions of each Reserve periodically and inform DEP of its findings on issues within DEP's authority;
2. advise DEP of existing and emerging national and regional issues; and
3. establish an information exchange network cataloging all available research data and educational material developed on each Reserve included within the NERRS.

C. General Provisions

1. Nothing in this agreement or subsequent financial assistance awards shall obligate any party in the expenditure of funds, or for future payments of money, in excess of appropriations authorized by law.
2. Both parties agree to comply with all applicable federal or State laws regulating ethical conduct of public officers and employees.
3. Each party will comply with all applicable laws, regulations, and executive orders relative to Equal Employment Opportunity.
4. Upon termination of this agreement or any subsequent financial assistance awards, any equipment purchased for studies initiated in furtherance of this agreement will be returned to the agency of initial purchase.
5. A free exchange of research and assessment data among agencies is encouraged and is necessary to insure the success of these cooperative studies.

D. Other Provisions

Nothing in this MOU diminishes the independent authority or coordination responsibility of each agency in administering its statutory obligations. Nothing herein is intended to conflict with current agency directives. If the terms of this MOU are inconsistent with existing directives of any agency entering into this agreement, then those portions which are determined to be inconsistent shall be invalid; but the remaining terms not

affected by the inconsistency shall remain in full force and effect. At the first opportunity for review of this agreement, all necessary changes will be made by either an amendment to this MOU or by entering into a new MOU, which ever is deemed expedient to the interest of all Parties. Should disagreement arise on the interpretation of the provisions of this MOU, or amendments and/or revisions thereto, that cannot be resolved at the operating level, the area(s) of disagreement shall be stated in writing by each party and presented to the other parties for consideration.

ARTICLE II: REAL PROPERTY ACQUIRED FOR THE PURPOSE OF EACH RESERVE

As well as agreeing to adhere to the rest of the provisions set forth at 15 CFR Part 921, DEP agrees to the conditions set forth at 15 CFR 921.21(e), which specify the legal documentation requirements concerning the use and disposition of real property acquired for Reserve purposes with Federal funds under Section 315 of the CZMA.

ARTICLE III. PROGRAM EVALUATION

OCRM will schedule periodic evaluations of the DEP's performance in meeting the terms of financial assistance awards, in implementing each Reserve's respective management plan and in meeting the provisions of this MOU. Where findings of deficiency occur, NOAA may initiate action in accordance with the designation withdrawal procedures established by the CZMA and applicable regulations.

ARTICLE IV. EFFECTIVE DATE, REVIEW, AMENDMENT AND TERMINATION

This MOU is effective on the date of designation of the GTMNERR and replaces the previous MOU with the Florida Department of Natural Resources dated May 20, 1986. The MOU will be reviewed periodically. This MOU may be amended by the mutual consent of the parties. This MOU may be terminated by mutual consent of the Parties, or by NOAA if it withdraws designation of any of the three areas as a National Estuarine Research Reserve, pursuant to applicable provisions of the CZMA and its implementing regulations as described under 15 CFR Part 923 Subpart L. Should this MOU be terminated, reimbursement of unexpended funds shall be determined on a pro rata basis according to the amount of work done by the Parties at the time of termination.

IN WITNESS THEREOF, the Parties hereto have caused this MOU to be executed.

Jeffrey R. Benoit
Jeffrey R. Benoit
Director
Office of Ocean and Coastal
Resource Management
National Ocean Service
National Oceanic and
Atmospheric Administration
U.S. Department of Commerce

12/4/98
Date

Kirby B. Green, III
Kirby B. Green, III
Secretary
Department of Environmental
Protection
State of Florida

21 December 1998
Date

APPROVED AS TO FORM AND LEGALITY

BY: [Signature]
DEP Attorney

DATE: 12/21/98

MEMORANDUM OF AGREEMENT

among the

Florida Department of Environmental Protection (DEP) Division of Marine Resources

DEP's Division of Recreation and Parks,

Florida Game and Fresh Water Fish Commission,

St. Johns River Water Management District,

National Park Service,

and

Flagler County,

for the cooperative management of the

GUANA TOLOMATO MATANZAS NATIONAL ESTUARINE RESEARCH RESERVE

Whereas, the Guana Tolomato Matanzas National Estuarine Research Reserve, hereinafter called the "Reserve", is established under authority of the Coastal Zone Management Act of 1972 (P.L. 96-583) and its amendments of 1976 (P.L. 94-370) and 1980 (P.L. 96-464) to designate representative sites of America's estuaries as natural field laboratories for gathering data through scientific studies of natural and human processes to enhance the scientific knowledge, environmental education, and on-site management of this estuarine ecosystem for the long term protection and benefit of the nation's coastlines; and,

Whereas, the National Estuarine Research Reserve (NERR) System is administered at the federal level by the National Oceanic and Atmospheric Administration's Office of Coastal Resource Management (NOAA/OCRM), and at the state level in Florida by the Department of Environmental Protection (DEP), Division of Marine Resources (DMR), Bureau of Coastal and Aquatic Managed Areas (CAMA); and,

Whereas, DEP and all the parties hereto are property owners and/or managers of lands included within the boundaries of the reserve who desire to enter into this agreement to:

Acknowledge the designation of the estuarine ecosystem comprised of the Guana, Tolomato, and Mantanzas (GTM) Rivers estuarine ecosystem and the surrounding publicly owned uplands as a NERR;

Commit the publicly owned lands within the Reserve boundaries that are managed by the parties of this agreement to inclusion into the reserve, with the understanding by all parties that neither the responsibility nor authority for the management of those uplands is altered whatsoever by this agreement;

Establish a partnership for the purpose of enhancing the ability to effectively manage this valuable ecosystem through cooperation, the sharing of knowledge, skills and abilities, and the recognition of the roles of each party in the operations and functioning of the Reserve;

Whereas, the parties recognize the fragile nature of the Reserve environment and that the routine activities in fulfilling their duties may affect the environmental quality of the Reserve;

Whereas, the parties recognize the need for continuing cooperation in managing the Reserve to ensure that the management of the Reserve remains consistent with the goals and objectives of the NERR System;

Whereas, it is mutually beneficial for Florida's NERRs to be operated on a permanent basis in a manner consistent with the guidelines of the NERR system as stated in 15 CFR Part 921, the objectives of the parties hereto, and the specific objective and goals as follows:

The objective of the Reserve is to establish and manage, through federal, state, and local government cooperation, a permanent NERR to provide opportunities for long-term scientific research and environmental education.

The goals of the NERR program for carrying out this objective are to:

Provide a scientific research and monitoring program in the Reserve which is responsive to the resource management needs of the cooperators for the purpose of ultimate improvement of the management of this coastal ecosystem; and,

Provide resource management by implementing a long-term management plan tailored to the site's specific resources; and,

Enhance public awareness and understanding of the estuarine environment through the implementation of environmental education programs in the local public schools and the nearby communities, and by conducting on-site interpretation of the natural and cultural resources within the Reserve; and,

Promote local, state, and federal government cooperation in the management of the Reserve.

BE IT THEREFORE RESOLVED, that the parties hereto covenant and agree to the following articles:

ARTICLE I - PURPOSE

The purpose of this agreement is to coordinate, through local, state, and federal government cooperation, the activities of all involved agencies to ensure the protection of the GTM estuary, to provide for the enhancement and promotion of scientific research and public environmental education, and to allow environmentally compatible public access and recreation.

ARTICLE II - RESPONSIBILITIES

DMR, in order to fulfill the obligations of this Agreement, shall:

Actively seek federal funding assistance that is available through the NOAA/OCRM and state funding assistance from the Florida Legislature for the development of the Reserve facilities and programs, and for the daily operations costs of the Reserve;

Manage the Reserve to the best of its ability at the level of funding and staffing provided by NOAA/OCRM and the Florida Legislature;

Accept sole responsibility for conformance with NERR program goals and objectives, as well as the administrative requirements, such as filing operations grant proposals, providing required financial and activity reports, and meeting other similar administrative functions required of the state partners of NOAA throughout the NERR system under federal and state law;

Develop, implement and update a management plan, which is compatible and consistent with the existing resource management plans of the parties hereto, as needed to achieve the federal and state program goals;

Provide the parties of this agreement the right of advance review and comment on the management plan and environmental impact statement for the reserve and any subsequent amendments thereto;

Provide a copy of the Reserve management plan to each of the parties of this agreement;

Provide scientific data and other information on issues affecting the Reserve and adjacent areas (this may include, but is not limited to, research reports, research proposals, educational materials, scientific publications and, periodic status reports);

Actively seek the cooperation and assistance of appropriate local, state and federal agencies and the public to enhance the Reserve's programs;

Recognize and acknowledge that the Reserve does not play a direct role in the management of the properties within the reserve boundaries;

Conduct and facilitate scientific research projects that are beneficial to the health and preservation of the GTM estuarine ecosystem, and contribute to the accomplishment of the goals of the parties to this agreement;

Establish a Management Advisory Group (MAG) by charter and seek program management advice from the MAG to assist in program operations;

Assist the responsible public land owners with efforts to acquire privately owned lands within or adjacent to the Reserve to provide additional upland buffers for the protection of the GTM estuarine ecosystem;

Provide the use of any Reserve facilities, equipment, and personnel as availability permits and DMR deems appropriate, for support to scientific researchers, environmental educators, resource managers, and the parties of this agreement;

Encourage participation of the parties to this agreement in Reserve functions such as, but not limited to, environmental education and scientific research workshops; and,

Monitor activities within the Reserve and report any problems or violations to the appropriate agencies.

Each of the other parties hereto, in order to fulfill the obligations of this Agreement, shall:

Recognize the MAG and its role as set forth in its Charter;

Recognize and support the implementation of the Reserve Management Plan to the extent possible without compromising their own management goals and objectives as stated in their approved management plans;

Provide DMR with a final published copy of approved management plans for properties within or adjacent to the Reserve;

Provide DMR with copies of scientific data and other information, which may include but not be limited to periodic status or progress reports and scientific publication;

Cooperate in good faith with DMR and all other parties hereto toward the goal of maximum environmental protection and public benefit;

Provide the use of facilities, equipment and personnel as available and within reasonable limits, as determined by each party, to assist in carrying out the Reserve duties and functions;

Strive to provide DMR with advance notice of all activities, including but not limited to ecological burns, road construction, and dredging within or adjacent to the Reserve which may affect the Reserve; and,

Allow access to the properties of the parties to this agreement to DMR staff for carrying out the environmental education, scientific research and environmental monitoring function of the reserve, in a manner that is acceptable to each party for their respective properties.

ARTICLE III - MISCELLANEOUS

This agreement shall remain in effect until canceled by the parties hereto.

Cancellation of this agreement between DEP and individual parties shall not affect the other parties hereto.

Any party to this agreement may cease its participation and attendant responsibilities with 30 days advance notice to all parties as follows:

Florida Game and Fresh Water Fish Commission
620 South Meridian Street
Tallahassee, Florida 32399-1600

St. Johns River Water Management District
P.O. Box 1429
Palatka, Florida 32708-1429

Flagler County Board of County Commission
1200 East Moody Boulevard #1
Bunnell, Florida 32330

National Park Service
Atlanta Federal Center
1924 Building
100 Atlanta Street, Southwest
Atlanta, Georgia 30303

Department of Environmental Protection
Division of Recreation and Parks
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

Department of Environmental Protection
Division of Marine Resources
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

This agreement shall become effective upon the date of execution by the parties hereto and shall remain in full force and effect until terminated.

BE IT FURTHER RESOLVED that the parties hereto agree to negotiate in good faith to deal with any points, whether or not specifically covered by this agreement, to resolve any differences in the best interest of the Reserve program and the public.

Florida Game and Fresh Water Fish Commission

The Florida Game and Fresh Water Fish Commission (GFC) and the Department of Environmental Protection (DEP) do hereby agree to the inclusion of the Guana River WMA properties under GFC management and lease from the Trustees into the Reserve, and recognize and acknowledge the obligations of GFC and DEP as stated previously in this agreement and the specific paragraph below:

GFC will include Reserve staff in the review and comment of Conceptual Management Plans and updates for management plans for the Guana River WMA. This does not include minor changes in hunting schedules, policy, road grading or other minor administrative changes. DEP recognizes that the GFC maintains the water control structure(s) and associated berms on the Guana River WMA and agrees that the GFC shall continue to utilize such structures to manipulate water levels on said lakes.

IN WITNESS WHEREOF, the legally designated agents for the parties hereto have caused this agreement to be executed on this 30th day of December, 1998.

Florida Game and Fresh Water Fish Commission

By: Allan Egbert
Allan L. Egbert, Ph.D., Executive Director

Jimmie C. Bell
Witness
Rona Wright
Witness

Department of Environmental Protection

By: Kirby B. Green, III
Kirby B. Green, III, Secretary

APPROVED AS TO FORM AND LEGALITY
BY: [Signature]
DEP Attorney
DATE: 12/21/98

Melli G. Palmer
Witness
[Signature]
Witness

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY
[Signature]
Commission Attorney

The St. Johns River Water Management District

The St. Johns River Water Management District (hereinafter referred to as the District), does hereby recognize, acknowledge, and agree to the inclusion of the District owned Pellicer Creek, Moses Creek and Stokes Landing properties, and to the obligations of DMR and the District as stated in the Agreement and in recognition of further obligations shall:

Cooperate with DMR to establish a coordinated environmental education program;

Coordinate scientific research projects within and adjacent to the Reserve and share resulting data;

Provide technical expertise and personnel assistance, to the greatest degree practicable, on issues relating to the District's statutory responsibilities within its jurisdiction, which relate to the Reserve;

Provide funding assistance for environmental education, scientific research, and resource management projects of the Reserve to the degree appropriate and reasonable, to be determined by the District;

Provide DMR the opportunity of advance review and comment on its proposed management plans, major development plans, major policy changes, permit applications, or other activities within or adjacent to the Reserve which may affect the quality of the Reserve;

Liabilities of the parties to this agreement shall be determined by the applicable laws and regulations now or hereafter in force; However, DMR, nor any person or entity claiming by or through DMR shall hold the District liable for any injury or damage to person or personal property which may occur on District-owners properties.

IN WITNESS WHEREOF, the legally designated agents for the parties hereto have caused this Agreement to be executed on this 30th day of December, 1998.

St. Johns River Water Management District

By: [Signature]
Henry Dean, Executive Director

Witness

Witness

Department of Environmental Protection

By: [Signature]
Kirby B. Green, III, Secretary

[Signature]
Witness

APPROVED AS TO FORM AND LEGALITY

BY: [Signature]
DEP Attorney

DATE: 12/28/98

[Signature]
Witness

Witness

National Park Service

The National Park Service (hereinafter referred to as the NPS) does hereby agree to the inclusion of the Ft. Matanzas National Monument into the GTMNERR, and recognizes, acknowledges, and agrees to the obligations of the NPS and DEP as stated in the Agreement and in recognition of further obligations shall:

Provide DEP the opportunity of advance review and comment on its proposed management plans, major development plans, major policy changes, permit applications or other activities within or adjacent to the Reserve which may affect the environmental quality of the Reserve;

DEP further agrees to the following further obligations:

During the performance of this Agreement, DEP agrees to abide by the terms of Executive Order 11246 on nondiscrimination and will not discriminate against any person because of race, color, religion, sex, or national origin, and will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex or national origin.

No member or delegate to Congress, or resident Commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom, but his provision shall not be construed to extend to this Agreement if made with a corporation for its general benefit.

IN WITNESS WHEREOF, the legally designated agents for the parties hereto have caused this Agreement to be executed on this 20th day of October, 1998.

National Park Service

By: [Signature]
Jerry Belson, Regional Director

[Signature]
Witness

[Signature]
Witness

Department of Environmental Protection

By: [Signature]
Kirby B. Green, III, Secretary

[Signature]
Witness

[Signature]
Witness

APPROVED AS TO FORM AND LEGALITY

BY: [Signature]
DEP Attorney

DATE: 12/28/98

The Flagler County Board of County Commissioners

The Flagler County Board of County Commissioners (hereinafter referred to as the Flagler Commission), does hereby agree to the inclusion of the upland properties of the "Princess Place", and recognizes and acknowledges the obligations of DMR and the Flagler Commission as stated in the Agreement and in recognition of further obligations shall:

Cooperate with DEP to establish a coordinated environmental protection program between the Flagler Commission and the Reserve at no cost to Flagler County. This program shall include, but not be limited to, organism identification, biological studies related to estuarine ecology, resource conservation, and the management of upland and submerged coastal resources in Flagler County.

IN WITNESS WHEREOF, the legally designated agents for the parties heretofore identified have caused this Agreement to be executed on this 21st Day of May, 1999 (1999)

Flagler County Board of County Commissioners

By: James A. Darby
James Darby, Chairman

APPROVED AS TO
FORM AND LEGALITY

Ray E. Quinn
COUNTY ATTORNEY

Mason J. Ford
Witness

Arthur P. Colton
Witness

Department of Environmental Protection

By: David B. Struhs
David B. Struhs, Secretary

Clayton Bakke
Witness

Jeanne Bridges
Witness

APPROVED AS TO FORM AND LEGALITY

BY: [Signature]
DEP Attorney

DATE: 5/4/99



Flagler County

Board of County Commissioners



1769 East Moody Boulevard, Building 2 • Bunnell, Florida 32110 • (386) 313-4000 • fax: (386) 313-4101 • www.FlaglerCounty.org

November 18, 2008

Michael Shirley, Ph.D.
Environmental Administrator
GTMNERR
505 Guana River Road
Ponte Vedra Beach, FL 32082

Re: Interagency MOU between DEP/GTMNERR and Flagler County

Dear Dr. Shirley:

Thank you for the opportunity to review the Guana Tolomato Matanzas National Estuarine Research Reserve's (GTMNERR) draft Management Plan revision of June 2008. Per your request, we have reviewed the existing MOU, the May 2000 amendments, and remain satisfied with the terms contained therein.

Please note that we are pleased to have Princess Place Preserve and River to Sea Preserve within the boundary of GTMNERR. We would like to reemphasize what is stated by the previous MOU. While the aforementioned Preserves are included in the MOU, Flagler County retains the responsibility and authority for management of those lands. It is also interesting to note that the draft management plan, section 9.2.1, considers an expansion of the GTMNERR to include lands contiguous with River to Sea Preserve. Flagler County would be interested in discussing a partnership in pursuit of this property at your convenience.

We look forward to continuing our partnership with the GTMNERR through the sharing of knowledge, skills and abilities, and we continue to recognize the importance of GTMNERR in our local and national communities.

Sincerely,

Milissa Holland, Chair
Flagler County Board of County Commissioners

C: Flagler County Board of County Commissioners

James M. O'Connell
District 1

Milissa Holland
District 2

James A. Darby
District 3

Bob Abbott
District 4

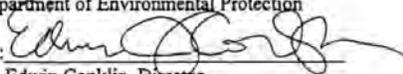
George Hanns
District 5

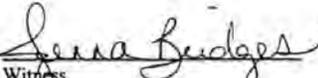
Division of Recreation and Parks

The Divisions of Recreation and Parks (DRP) and Marine Resources (DMR) of the Florida Department of Environmental Protection recognize, acknowledge and agree to the inclusion of the Faver Dykes and Guana River State Parks and the Washington Oaks State Gardens into the GTMNERR and to the obligations of both divisions and the department in the management of the GTMNERR and vow to work cooperatively in carrying out their respective duties and responsibilities to develop this reserve into another well managed and effective coastal management project that will contribute to the accomplishment of the goals and objectives of both divisions and the department.

IN WITNESS WHEREOF, the legally designated agents for the parties hereto have caused this Agreement to be executed on this 28th day of December, 1998.

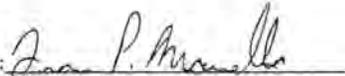
Department of Environmental Protection

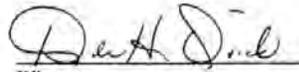
By: 
Edwin Conklin, Director
Division of Marine Resources

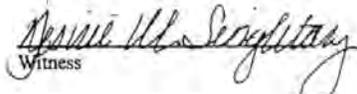

Witness


Witness

Department of Environmental Protection

By: 
Fran P. Mainella, Director
Division of Recreation and Parks


Witness


Witness



Florida Department of Environmental Protection

District 3 Administration
1800 Wekiwa Circle
Apopka, FL 32712
407/884-2000

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

September 26, 2008

Forrest Penny
Stewardship Coordinator
GTM Research Reserve
505 Guana River Road
Ponte Vedra Beach, FL 32082

Dear Forrest:

Thank you for the opportunity to review the Cooperative MOU the Florida Division of Recreation and Parks has with GTMNERR. If revisions are to be made, please note a change of Division Director and a change of a parks name are two items identified for correction. Our current director is Mike Bullock and the correct park name is Washington Oaks Gardens State Park. Otherwise, the MOU appears to be in order and continues to meet our needs. We enjoy our working relationships with you and with the other agencies represented in this agreement. It is our desire to continue in such a relationship.

Sincerely,

Larry Fooks, Chief
Parks District 3

C: Albert Gregory, Chief of Park Planning
Doug Carter, Park Manager

"More Protection, Less Process"

FDACS CONTRACT #

009260

MEMORANDUM OF AGREEMENT

between the

Florida Department of Environmental Protection (DEP), Office of Coastal and Aquatic Managed Areas (CAMA)

and the

Florida Department of Agriculture and Consumer Services, Division of Forestry (DOF)

for the cooperative management of the

GUANA TOLOMATO MATANZAS NATIONAL ESTUARINE RESEARCH RESERVE

Whereas, the Guana Tolomato Matanzas National Estuarine Research Reserve, hereinafter called the "Reserve", is established under authority of the Coastal Zone Management Act of 1972 (P.L. 96-583) and its amendments of 1976 (P.L. 94-370) and 1980 (P.L. 96-464) to designate representative sites of America's estuaries as natural field laboratories for gathering data through scientific studies of natural and human processes to enhance the scientific knowledge, environmental education, and on-site management of this estuarine ecosystem for the long term protection and benefit of the nation's coastlines; and,

Whereas, the National Estuarine Research Reserve (NERR) System is administered at the federal level by the National Oceanic and Atmospheric Administration's Office of Coastal Resource Management (NOAA/OCRM), and at the state level in Florida by the Department of Environmental Protection (DEP), Office of Coastal and Aquatic Managed Areas (CAMA); and,

Whereas, DEP and all the parties hereto are property owners and/or managers of lands included within the boundaries of the reserve who desire to enter into this agreement to:

Acknowledge the designation of the estuarine ecosystem comprised of the Guana, Tolomato, and Matanzas (GTM) Rivers estuarine ecosystem and the surrounding publicly owned uplands as a NERR;

Commit the publicly owned lands within the Reserve boundaries that are managed by the parties of this agreement to inclusion into the reserve, with the understanding by all parties that neither the responsibility nor authority for the management of those uplands is altered whatsoever by this agreement;

Establish a partnership for the purpose of enhancing the ability to effectively manage this valuable ecosystem through cooperation, the sharing of knowledge, skills and abilities, and the recognition of the roles of each party in the operations and functioning of the Reserve;

Whereas, the parties recognize the fragile nature of the Reserve environment and that the routine activities in fulfilling their duties may affect the environmental quality of the Reserve;

Whereas, the parties recognize the need for continuing cooperation in managing the Reserve to ensure that the management of the Reserve remains consistent with the goals and objectives of the NERR System;

Whereas, it is mutually beneficial for Florida's NERRs to be operated on a permanent basis in a manner consistent with the guidelines of the NERR system as stated in 15 CFR Part 921, the objectives of the parties hereto, and the specific objective and goals as follows:

The objective of the Reserve is to establish and manage, through federal, state, and local government cooperation, a permanent NERR to provide opportunities for long-term scientific research and environmental education.

The goals of the NERR program for carrying out this objective are to:

Provide a scientific research and monitoring program in the Reserve which is responsive to the resource management needs of the cooperators for the purpose of ultimate improvement of the management of this coastal ecosystem; and,

Provide resource management by implementing a long-term management plan tailored to the site's specific resources; and,

Enhance public awareness and understanding of the estuarine environment through the implementation of environmental education programs in the local public schools and the nearby communities, and by conducting on-site interpretation of the natural and cultural resources within the Reserve; and,

Promote local, state, and federal government cooperation in the management of the Reserve.

BE IT THEREFORE RESOLVED, that the parties hereto covenant and agree to the following articles:

ARTICLE I- PURPOSE

The purpose of this agreement is to coordinate, through local, state, and federal government cooperation, the activities of all involved agencies to ensure the protection of the GTM estuary, to provide for the enhancement and promotion of scientific research and public environmental education, and to allow environmentally compatible public access and recreation.

ARTICLE II - RESPONSIBILITIES

CAMA, in order to fulfill the obligations of this Agreement, shall:

Actively seek federal funding assistance that is available through the NOAA/OCRM and State funding assistance from the Florida Legislature for the development of the Reserve facilities and programs, and for the daily operations costs of the Reserve;

Manage the Reserve to the best of its ability at the level of funding and staffing provided by NOAA/OCRM and the Florida Legislature;

Accept sole responsibility for conformance with NERR program goals and objectives, as well as the administrative requirements, such as filing operations grant proposals, providing required financial and activity reports, and meeting other similar administrative functions required of the state partners of NOAA throughout the NERR system under federal and state law;

Develop, implement and update a management plan, which is compatible and consistent with the existing resource management plans of the parties hereto, as needed to achieve the federal and state program goals;

Provide the parties of this agreement the right of advance review and comment on the management plan and environmental impact statement for the reserve and any subsequent amendments thereto;

Provide a copy of the Reserve management plan to each of the parties of this agreement;

Provide scientific data and other information on issues affecting the Reserve and adjacent areas (this may include, but is not limited to, research reports, research proposals, educational materials, scientific publications and periodic status reports);

Actively seek the cooperation and assistance of appropriate local, state and federal agencies and the public to enhance the Reserve's programs;

Recognize and acknowledge that the Reserve does not play a direct role in the management of the public conservation lands with other lead managers within the reserve boundaries;

Conduct and facilitate scientific research projects that are beneficial to the health and preservation of the GTM estuarine ecosystem, and contribute to the accomplishment of the goals of the parties to this agreement;

Establish a Management Advisory Group (MAG) by charter and seek program management advice from the MAG to assist in program operations;

Assist the responsible public land owners with efforts to acquire privately owned lands within or adjacent to the Reserve to provide additional upland buffers for the protection of the GTM estuarine ecosystem;

Provide the use of any Reserve facilities, equipment, and personnel as availability permits and CAMA deems appropriate, for support to scientific researchers, environmental educators, resource managers, and the parties of this agreement;

Encourage participation of the parties to this agreement in Reserve functions such as, but not limited to, environmental education and scientific research workshops; and,

Monitor activities within the Reserve and report any problems or violations to the appropriate agencies.

The Division of Forestry, in order to fulfill the obligations of this Agreement, shall:

Recognize the MAG and its role as set forth in its Charter;

Recognize and support the implementation of the Reserve Management Plan to the extent possible without compromising their own management goals and objectives as stated in their approved management plans;

Provide CAMA with a final published copy of approved management plans for properties within or adjacent to the Reserve;

Provide CAMA with copies of scientific data and other information, which may include but not be limited to periodic status or progress reports and scientific publications;

Cooperate in good faith with CAMA and all other parties hereto toward the goal of maximum environmental protection and public benefit;

Provide the use of facilities, equipment and personnel as available and within reasonable limits, as determined by DOF, to assist in carrying out the Reserve duties and functions;

Strive to provide CAMA with advance notice of all activities, including but not limited to ecological burns, road construction, and dredging within or adjacent to the Reserve which may affect the Reserve; and,

Allow access to the properties of the parties to this agreement to CAMA staff for carrying out the environmental education, scientific research and environmental monitoring function of the reserve, in a manner that is acceptable to each party for their respective properties.

ARTICLE III - MISCELLANEOUS

This agreement shall remain in effect until canceled by the parties hereto.

Cancellation of this agreement between DEP and The Division of Forestry shall not affect the similar agreements with other land managing agencies.

Either party to this agreement may cease its participation or attendant responsibilities with 30 days advance notice to all parties as follows:

Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas
3900 Commonwealth Boulevard Tallahassee, Florida 32399

Guana Tolomato Matanzas National Estuarine Research Reserve (GTMNERR)
9741 Ocean Shore Blvd., St. Augustine, Florida 32080

Florida Department of Agriculture and Consumer Services
Division of Forestry
3125 Conner Blvd., Tallahassee, Florida 32399-1650

This agreement shall become effective upon the date of execution by the parties hereto and shall remain in full force and effect until terminated.

BE IT FURTHER RESOLVED that the parties hereto agree to negotiate in good faith to deal with any points, whether or not specifically covered by this agreement, to resolve any differences in the best interest of the Reserve program and the public.

ARTICLE IV – DIVISION OF FORESTRY

The Florida Department of Agriculture and Consumer Services, Division of Forestry (DOF) and the Department of Environmental Protection (DEP) do hereby agree to the inclusion of Matanzas State Forest and Deep Creek State Forest under DOF management, within the GTMNERR, and recognize and acknowledge the obligations of DOF and DEP as stated previously in this agreement and the specific paragraph below:

DOF shall appoint a member of the Reserve staff to its Matanzas State Forest Liaison Committee.

DOF shall include Reserve staff in the review of the 10-year management plan for the Forest as well as any updates to that plan.

DOF shall provide the Reserve, upon request, with a copy of the annual work plan for the Forest. It is understood that this does not include routine maintenance activities.

DOF shall appoint a representative of DOF to serve on the GTMNERR Management Advisory Group.

IN WITNESS WHEREOF, the legally designated agents for the parties hereto have caused this agreement to be executed on this 27th day of September, 2004.

Florida Department of Agriculture and Consumer Services
Division of Forestry

By: Mike Gresham
Mike Gresham, Director, Division of Administration

Chrissie Adams
Witness
Loren A. Meyer
Witness

Department of Environmental Protection

By: Katherine Andrews
Katherine Andrews, Director
Office of Coastal and Aquatic Managed Areas

Dennis M. Riley
Witness
Ellen L. Stora
Witness

Memorandum of Understanding

between

The State of Florida, Fish and Wildlife Conservation Commission

and

The State of Florida, Department of Environmental Protection

WHEREAS, Section 9 of the Florida Constitution Article IV establishes the Florida Fish and Wildlife Conservation Commission, hereinafter called FWC, to manage wild animal life, fresh water aquatic life, and marine life to provide for the effective conservation of those natural resources;

WHEREAS, the Florida Department of Environmental Protection, hereinafter called DEP, as staff of the Board of Trustees of the Internal Improvement Trust Fund, manages the sovereignty submerged lands of Florida, which comprise all the components of marine habitat;

WHEREAS, DEP managed sites contain some of the most productive and popular saltwater recreation venues in the world including: 41 Aquatic Preserves that encompass more than 1.8 million acres of sovereignty submerged lands of the state; 160 state parks that include 100 miles of sandy white beaches; 3 National Estuarine Research Reserves that include over 350,000 acres of the most pristine and productive estuarine ecosystems in the nation; and the Florida Keys National Marine Sanctuary that covers over 2900 square nautical miles of diverse and unique saltwater fisheries habitats and species;

WHEREAS, these sites attract millions of people every year, many of whom come from all parts of the world to participate in Florida's marine recreational activities;

WHEREAS, the agencies' complementary responsibilities and authorities address the two major factors in marine resource conservation, which are the effective management of the habitat and the harvest of marine organisms;

WHEREAS, the accomplishment of each of these agencies' responsibilities is related to the effectiveness of their collective efforts;

WHEREAS, the coordination of efforts by these agencies shall facilitate achievement of their mutual marine resource conservation goal;

WHEREAS, both agencies have existing environmental outreach programs throughout the state aimed at informing the public about marine resource conservation issues and marine recreational opportunities; and,

WHEREAS, there are rapidly increasing demands on the marine resources and for information about those resources.

THEREFORE, BE IT RESOLVED, that FWC and DEP shall hereby establish the Marine Resource Conservation Partnership (MRCP) to effectively manage the marine resources of the State of Florida for the benefit of the public and future generations by designing and implementing non-regulatory saltwater recreational outreach and education programs through inter-agency coordination and cooperation in accordance with state-approved management plans, and contingent on available funding.

THEREFORE, BE IT FURTHER RESOLVED, that FWC and DEP shall solicit and welcome any other interested entities or individuals into the Marine Resource Conservation Partnership including local, state and federal government agencies, industry, non-government organizations, and conservation organizations that wish to protect the marine resources under the guidelines established by FWC and DEP policies and programs. The inclusion of those partners shall be acknowledged by execution of a Memorandum of Understanding by the authoritative party of the joining entity and the FWC and DEP project administrators, which will be included as an addendum to this document.

IN WITNESS HEREOF, the parties hereto have executed this agreement on the dates set forth below.

FOR FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION:

Michael W. Sole *Michael W. Sole* Date: February 21, 2007
Secretary (Signature)
Florida Department of Environmental Protection

FOR THE FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION:

Kenneth D. Haddad *Kenneth D. Haddad* Date: 3/13/07
Executive Director (Signature)
Florida Fish and Wildlife Conservation Commission

To Whom It May Concern:

The undersigned, Christopher Benjamin, represented the St. Johns County Board of County Commissioners as coordinator of all activities related to the nomination and designation of the GTM NERR.

I was the primary county contact with FDEP, NOAA, Flagler County officials, the Florida Cabinet, the Florida Legislature, and the Governor's Office.

Moreover, I arranged and facilitated all committee meetings and public meetings and assisted with all FDEP meetings as requested. I still have in my possession all of the files related to these activities.

The original MOU(attached) which is the subject of this letter was created and approved by a ten-member committee initiated by State Representative Tracy Upchurch.

The intent of the original MOU was to clarify and define the conditions under which the Upchurch Committee could vote to support a recommendation to approve the nomination of Phase One of the GTMNERR to the Florida Cabinet and NOAA. After discussing the response to the MOU from FDEP, the Upchurch Committee voted to recommend the nomination of Phase One of the GTMNERR to the Governor and Cabinet.

I was a voting member of the original Management Plan Advisory Group (MPAG), appointed to that position by State Representative Joe Arnall. The MPAG voted to include the MOU as a valuable reference in the proposed management plan. It has since been referenced in all updated management plans prepared by GTMNERR staff.

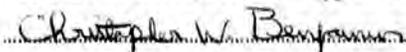
As a member, and Chair, of the current MAG, I participated in the December, 2008 meeting where the MOU was discussed by the Group. Frank Usina, a member of the original Upchurch Committee, and a current MAG member, and I provided the Group with background concerning the MOU.

The MAG reviewed, amended, and then voted to approve a "Letter of Support by the Management Advisory Group for the GTM Research Reserve."

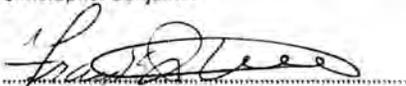
The intent of the original MOU was to guarantee a degree of citizen participation in the management of the GTMNERR and to underscore the scientific, non-regulatory nature of the Reserve.

These objectives have in fact been accomplished and are sustained by the current Management Advisory Group. I believe it is in the best interests of the citizens of the State of Florida to resolve any technicality of succession raised by the original MOU by accepting the "Letter of Support" passed by the MAG at the December, 2008 meeting and to henceforth hold that the current MAG is the de facto successor to any citizen advisory group referenced in the MOU.

Please call me at (904) 827-6980 if you wish to contact me about this matter.

 St. Johns County Coordinator for the Upchurch Committee

Christopher Benjamin

 Upchurch Committee Member [attester]

Frank Usina

Signed this 2nd day of March, 2009.

Letter of Support by the Management Advisory Group for the GTM Research Reserve

Whereas the Estuary Committee (Also Known as the Upchurch Committee) appointed in 1994 as an advisory committee recommended the establishment of the Guana Tolomato Matanzas National Estuarine Research Reserve (GTM Research Reserve) Management Advisory Group (MAG) with the intention for this group to supersede in this advisory function.

Whereas the MAG recognizes that the establishment of the GTM Research Reserve and continuation of its research, stewardship and education programs is compatible with the vision of the Estuary Committee as a non-regulatory science-based program.

Whereas the MAG has been given approval by presiding State legislators to directly establish membership and be a self governing advisory group.

Whereas the MAG maintains a charter that ensures that its advisory function is maintained in the best interest of the citizens of St. Johns County and Flagler County and that includes provisions to conduct meetings in accordance with State of Florida's Government-in-the-Sunshine Law.

Whereas the MAG has reviewed and commented on this revised management plan and finds it to be in keeping with the established criteria guiding the recommended functions of the GTM Research Reserve.

The MAG of the GTM Research Reserve hereby endorses the revised GTM Research Reserve Management Plan and finds that it is consistent with the intentions of the Estuary Committee as described in the original Memorandum of Understanding (attached as an historical reference)

Recommendations

Notice:

The meetings of the MAG shall continue to be noticed in accordance with the State of Florida's Government-in-the-Sunshine Law and at a frequency and location determined by the MAG charter. The MAG secretary will ensure that all members are notified within 10 days of any MAG meeting and that the meeting times and locations are advertised in local newspapers in St. Johns County and Flagler County.

Water Quality Classification:

The GTM Research Reserve Staff will not initiate changes to water quality classifications of any waters within the Reserve's Boundary. However it is not the intention of this recommendation to prohibit the GTM Research Reserve from facilitating or conducting research that provides scientific information to guide citizen or public agency initiated proposals that may alter water quality classification. Petitions to alter water quality classifications within the GTM Research Reserve by public agencies or citizen groups are not constrained by this recommendation.

Public Access:

Regulations governing public access of the waters, wetlands, and other resources within the GTM Research Reserve will be the same as those governing similar activities in estuarine areas that are not subject to Research Reserve designation.

Commercial and Recreational Fishing and Boating:

Regulations governing commercial and recreational fishing and boating within the GTM Research Reserve will be the same as those governing similar activities in estuarine areas that are not subject to Research Reserve designation.

Development and Jurisdictional:

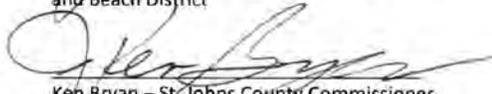
The GTM Research Reserve will serve a non-regulatory role relative to activities within or adjacent to its boundary. This recommendation is not intended to restrict the GTM Research Reserve's ability to facilitate, conduct or otherwise provide science-based information to promote informed decision making. The GTM Research Reserve is encouraged to conduct and facilitate research and educational programming leading to the development or implementation of best management practices to sustain the natural resources of St. Johns County and Flagler County and to guide landuse decisions affecting these resources. The GTM Research Reserve Staff is also encouraged to provide science-based information and express concerns regarding regulated activities but are not authorized to recommend approval or denial of permits associated with these activities.

Extensions of the GTM Research Reserve Boundary:

Extensions to the GTM Research Reserve is limited to annexation of public lands, fee simple and less than fee simple acquisition of private lands so long as the activity is voluntary on the part of the managing agency or private land owner. Expansions to the GTM Research Reserve Boundary will be noticed using the same criteria as MAG meetings and are subject to State and Federal notice procedures.


Dr. Barbara Battelle – Citizen Appointee


Barry Benjamin – St. Augustine Port, Waterway and Beach District

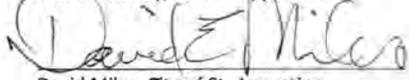

Ken Bryan – St. Johns County Commissioner

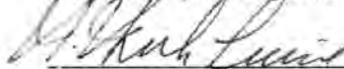

Ernest Clark – Army Corps of Engineers

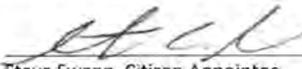
Abstain
Michael Cullum, St. Johns River Water Management District

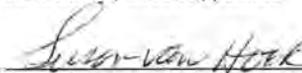

John Hankinson, Citizen Appointee

Absent
William Hurley, Citizen Appointee

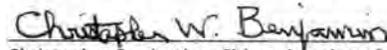

David Miles, City of St. Augustine

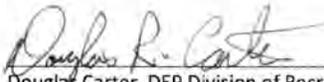

Pierre Pierce, Friends of the GTM Reserve Board

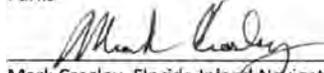

Steve Swann, Citizen Appointee


Susan Van Hoek, Citizen Appointee

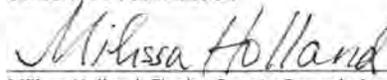
Absent
Dennis K. Bayer – Citizen Appointee

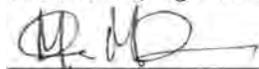

Christopher Benjamin – Citizen Appointee*

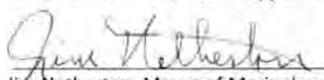

Douglas Carter, DEP Division of Recreation and Parks

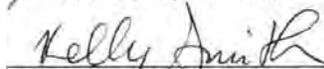

Mark Crosley, Florida Inland Navigation District

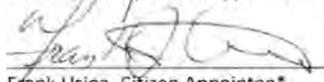

Justin Ellenberger, Florida Fish and Wildlife Conservation Commission


Milissa Holland, Flagler County Commissioner


Mark Middlebrook, Citizen Appointee


Jim Netherton, Mayor of Marineland


Dr. Kelly Smith, Citizen Appointee


Frank Usina, Citizen Appointee*


Gordon Wilson, National Park Service

*Member of the Original 1994 Estuary Committee (Also Known as the Upchurch Committee)

TOLOMATO-GUANA-MATANZAS NATIONAL ESTUARINE
RESEARCH RESERVE PROPOSAL

MEMORANDUM OF UNDERSTANDING
FOR THE CITIZENS OF ST. JOHNS AND FLAGLER COUNTIES

PREAMBLE

WE, the citizens of St. Johns and Flagler Counties welcome the opportunity to have portions of the Tolomato-Guana-Matanzas estuarine system designated as a National Estuarine Research Reserve (NERR). This designation will attract scientists, educators and students from throughout the State to engage in research and learning activities within an exemplary estuarine setting where man and nature have co-existed successfully for many years.

It is a compliment to our citizens that a major segment of their estuarine system has qualified for designation as a NERR site. However, our citizens must be assured that the NERR designation does not decrease their rights to use the waterway and its resources in ways which are legal in other coastal Florida areas. Hence, we declare that both the acceptance, and the continuation, of the NERR designation for portions of the Tolomato-Guana-Matanzas estuarine system is contingent upon a list of recommendations and findings as defined by this Committee. Prior to acceptance of the NERR designation, the recommendations stated below must be acknowledged in writing by all City, County, District and State Agencies which are empowered with legal, jurisdictional, or managerial control over the NERR site.

RECOMMENDATIONS:

Notice:

In addition to any notice requirements mandated by Florida and/or Federal law, all State or Federal meetings to discuss changes or amendments to the TGM NERR boundaries and water classifications as designated by the Estuary Committee, shall be announced by a minimum of one (1) display advertisement in the St. Augustine Record, or its successor, and in the newspapers of general

circulation in Flagler County or their successors. Such advertisement shall precede the actual meeting by no less than one calendar week (7 days), and by no more than four weeks (28 days). In addition, notice of all such meetings shall be announced by letter to each of the following groups and individuals no less than ten (10) days before the meeting date: the present full Estuary Committee, or its standing representation; the TGM Management Advisory Group; the St. Johns County Administrator; the Mayor of the City of St. Augustine; the Mayor of the City of St. Augustine Beach; Chair of the St. Johns County Board of County Commissioners; and the Chair of the Flagler County Board of County Commissioners.

Water Classifications:

Waters within the NERR site that are currently classified as Outstanding Florida Waters (OFW) will retain this classification. Waters that are currently classified as Class II or Class III Waters will retain this classification and not be reclassified as OFW.

Public Access:

Regulations governing public access and utilization of the waters, wetlands, and other resources within the NERR site will be the same as those governing similar activities in estuarine areas which are not subject to NERR designation.

Fishing:

Regulations governing recreational or commercial fishing, crabbing, and shellfishing activities within the NERR site, will be the same as those governing similar activities in estuarine areas which are not subject to NERR designation.

Boating:

Regulations governing recreational or commercial use of boats or other water-borne vehicles within the NERR site, will be the same as those governing similar activities in estuarine areas which are not subject to NERR designation.

Development:

Regulations governing the activities of existing property owners, new building projects, and other private, commercial or industrial developments within or adjacent to the NERR site, will be the same as those governing similar activities within or

adjacent to other estuarine areas which are not subject to NERR designation.

Extensions of NERR Boundaries:

Any future proposals to extend current NERR boundaries shall require the same public notice and meetings as described in the Notice Recommendations cited above.

Jurisdiction:

The Bureau of Sanctuaries and Reserves and the NERR shall have no regulatory, rule-making, review authority, or review comment ability over any areas outside of the designated boundaries of the NERR.

Management and Citizens Advisory Groups:

One way that local jurisdictions have played an interactive role in estuary management is by the formation of advisory boards composed of the Reserve Manager, local public officials, and interested private citizens.

Established NERR guidelines call for a hands-on management group of limited membership and for a citizens's committee with a larger enrollment and a less formal structure.

In the specific case of the proposed TGM Estuary, we propose that the Management Group consist of the following individuals:

- (1) The Reserve Manager or His/Her Designee;
- (2) Mayor, City of St. Augustine or His/Her Designee;
- (3) A Commissioner of St. Johns County or His/Her Designee;
- (4) A Commissioner of Flagler County or His/Her Designee;
- (5) A Representative of the St. Johns River Water Management District;
- (6) A Representative from the State Park Service, Game and Fresh Water Fish Commission or any other State Agency which currently administers State lands or waters within the Legal limits of St. Johns County; and,
- (7) A Representative from the City of St. Augustine Port, Waterway, and Beach Commission,

(8-14) Seven private citizens, to include at least one individual from Flagler County.

In no case shall the number of public officials exceed the number of private citizens on the Management Group.

The selection of private citizens to the Management Group is based upon applications and nominations received by the Upchurch Estuary Workshop Committee or a standing entity thereof, by Representative Upchurch, or by his designee(s). Citizens shall be chosen for a specific term and each must be present to vote unless incapacitated by illness or unavoidable absence, in which case a notarized proxy will be accepted.

The Management Group shall be limited to a total of 14 members.

The Citizens Advisory Group shall consist of such number of private citizens as the Management Group deems useful and efficient. In no case shall any individual hold concurrent membership in both the Management and Citizen's Advisory Groups. Both committees shall be formed upon notification by the appropriate Federal and State of Florida officials that the TGM site has been accepted for NERR designation.

Recommendations for proposed NERR Boundaries:

Northern Area: The proposed Tolomato-Guana Reserve area should include (footprint) all of the lands and waters included in the Legal Jurisdiction of the Guana River Marsh Aquatic Preserve, as described in the GRMAP Management Plan, as confirmed by the Florida Department of Environmental Protection, Bureau of Survey and Mapping, and as authorized by F.S. 258.394.

Southern Area: The northern boundary of the proposed Matanzas River Reserve Area should be drawn at the jurisdictional (category) line where Class II and Class III waters meet (approximately at Marker 29, south of Moultrie Creek).

The Southern Boundary of the proposed Matanzas River Reserve area should be placed at the northern perimeter line of the first artificial canal in Flagler County, and should include the tributary waters of Long Creek.



Lawton Chiles
Governor

Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Virginia B. Wetherell
Secretary

February 2, 1994

Honorable Tracy W. Upchurch
Representative 20th District
Post office Box 4227
St. Augustine, FL 32085-4227

Dear Representative Upchurch:

Secretary Wetherell and I, as well as staff of the Bureau of Sanctuaries and Research Reserves, appreciate your efforts regarding the proposal to nominate the Guana, Tolomato, and Matanzas Rivers as a National Estuarine Research Reserve. The committee that you formed has worked hard to address the public concerns.

The Department's responses to the recommendations in the committee's Memorandum of Understanding (MOU) are as follows:

Notice - Acceptable, contingent on Legislative Appropriations.

Water Classification - Acceptable

Public Access - Acceptable

Fishing - Acceptable

Boating - Acceptable

Development - Acceptable

Extensions of NERR Boundaries - Acceptable

Jurisdiction - Acceptable, if changed to recognize review and comment by individual employees is a routine responsibility of all Bureau of Sanctuaries and Research Reserve staff as directed by the Department.

Honorable Tracy W. Upchurch
February 2, 1994
Page Two

Management and Citizens Advisory Groups - The recommendation is acceptable. The management advisory committee includes the following representatives: Mayor of the City of St. Augustine; county commissioners from both St. Johns and Flagler Counties; the City of St. Augustine Port, Waterway, and Beach Commission; the Reserve Manager or other DEP representative; the St. Johns River Water Management District; the State Park Service; Game and Freshwater Fish Commission; other state agencies that administer state lands or waters in St. Johns County; and, several private citizens appointed by you or your Estuary Workshop Committee. However, the Department prefers to not specify the exact number of representatives prior to thoroughly evaluating all options for the inclusion of scientific researchers, environmental educators, or other representatives with appropriate disciplines. We also prefer to establish the Management Advisory Committee and then work with that committee to establish specific selection criteria and representation for the Citizens Advisory Committee.

Recommendations for Proposed NERR Boundaries - Acceptable

Please express our thanks to the committee members and the residents of St. Johns and Flagler Counties for their interest, assistance and cooperation in this project. We look forward to working with you, other public officials, and the citizens to develop a Research Reserve that will help us manage the GTM ecosystem.

Sincerely,



R. Dale Patchett
Deputy Assistant Secretary

RDP/dmr

Memorandum

Florida Department of
Environmental Protection

Date: June 29, 1994

To: Ed Conklin
Dan Riley
Ken Plante

From: M.B. Adelson IV 

Subject: "Legal effect" of a Memorandum of Understanding (MOU) between the Department and the East Coast National Estuarine Research Reserve Selection Committee

You have asked me whether the subject MOU is "legally binding" on the Department. The question is somewhat confusing, but my understanding of the circumstances and my legal conclusion is provided below. Outside of a legal opinion, I believe the integrity of both the Department and the Committee certainly suggest the good faith expressed and the expectation that the agreement will be honored in letter and intent.

In order for the area addressed in Phase II to be designated a research reserve, the Governor and Cabinet, acting in their capacity as the Trustees of the Internal Improvements Trust Fund (BOT) must formally nominate the area for designation as a research reserve to the U.S. Secretary of Commerce. The process for making this nomination is through an agenda item presented to the BOT for approval. The MOU is presented with the agenda item materials, and serves to add definitions, conditions, and terms that both the Department and the members of the East Coast National Estuarine Research Reserve Selection Committee have established as part of the effect and meaning of the designation of this (the Phase II) area as a research reserve.

While the MOU clarifies and defines certain things for the benefit of BOT decision making and later considerations of stewardship and management activities pertinent to the research reserve, the MOU does not supersede any lawful statute, rule, federal regulation, or other legislative or administrative application that exists or is applicable to the area. For example, designation as Class II Waters is an independent designation, and this existing designation is neither made more stringent nor abated by inclusion of the Class II Waters within the Phase II area designation as a research reserve under the terms, definitions and other statements contained in the MOU. Where the rules and regulations may be silent, the MOU may serve to clarify or otherwise guide decision-making considerations.

Memorandum to Ed Conklin, Dan Riley and Ken Planck
June 29, 1994
page 2

The MOU is a policy statement and a report, which makes it less controlling than a statute or administratively adopted rule, but more than a mere opinion or sentiment. It is created and presented as formal guidance for decisionmaking. It is intended by all signatories that persons affected by the designation, including the Governor and Cabinet, rely on it and use it to understand and comprehend the statements it contains and apply those meanings to future decisions regarding the area it addresses, within the limits and meanings of existing rules, regulations, laws and federal regulations as they may also apply to the area or portions of the area designated in the research reserve.

If someone felt in the future that the MOU had been "breached" by the Department, their claim would sound in allegations of arbitrary or capricious conduct, claiming that some action was allegedly inconsistent with the terms or expressed intent of the MOU. The MOU, where relevant, could be reviewed for evidence of expression of parameters of the decision or activity being challenged. Although reasonable persons may differ, the MOU, together with interpretive rules of contract and statutory construction, would be used to assist a hearing officer or decisionmaker in judging the challenged act against the expressed standards, definitions, or other terms that impact the subject being considered. Thus, the "legally binding" effect is more in the nature of definitions and reliable recommendation selections, as well as support for the BOT's nomination of the described area as a research reserve. It is a formal agreement between an official committee and the Department. It is not, however, a contract, rule or statute.

Please call me if you have any more questions, or would like any other issue discussed. You may reach me at 488 9314.

AOL1

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION,
OFFICE OF COASTAL AND AQUATIC MANAGED AREAS
ASSIGNMENT AND ASSUMPTION OF

Lease Number:

3462 Guana River State Park

The State of Florida Department of Environmental Protection, Division of Recreation and Parks ("Assignor"), for value received does, subject to written consent of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida ("Lessor"), hereby assign, transfer and convey 100% of its rights, title, and interest vested under the above referenced lease ("Lease") made and entered into by and between Lessor and Assignor, as Lessee, to the State of Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas ("Assignee"), for and during the remainder of the term of the Lease and all renewals thereof, subject to the performance of all covenants, conditions, and provisions required to be performed by the Lessee under the terms of the Lease, and subject to the conditions and provisions therein set forth.

Dated December 15, 2003.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION,
DIVISION OF RECREATION AND PARKS

By: Albert G. Gregory (SEAL)
Albert G. Gregory

Title: Chief, Office of Park Planning

"Assignor"

Jenna Hughes
Witness
Jenna Hughes
Print/Type Witness Name

Willem Footman
Witness
Willem Footman
Print/Type Witness Name

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 15th day of December, 2003, by Albert G. Gregory, Chief, Office of Park Planning, Division of Recreation and Parks, State of Florida Department of Environmental Protection. He is personally known to me.

(SEAL)

Dale H. Quick
Notary Public, State of Florida

Dale H. Quick
Commission # DD122787
Print/Type Notary Name
Expires June 20, 2006
Atlantic Bonding Co., Inc.

Commission Number:

Commission Expires:

ACCEPTANCE OF ASSIGNMENT AND ASSUMPTION OF LEASE

The State of Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas ("Assignee"), in consideration of the foregoing Assignment, subject to written consent of the Lessor, does hereby accept assignment of the Lease, and assumes and agrees for the benefit of the Lessor to perform all covenants, agreements, conditions and provisions of the Lease. Further, Assignee agrees that it, its successors and assigns shall be bound for the due performance herein in the same manner as was the Assignor, as the original Lessee named in the Lease, for and during the remainder of the term of the Lease and all renewals thereof.

Dated December 5, 2003.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF COASTAL AND AQUATIC MANAGED AREAS

Ellen K. Stere
Witness
Ellen K. Stere
Print/Type Witness Name

BY: Katharine Andrews (SEAL)

Katherine Andrews
Print/Type Name

Sherry G. Ervin
Witness
Sherry G. Ervin
Print/Type Witness Name

Title: CAAM Director
"Assignee"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 5th day of December, 2003 by Katherine Andrews, as Director, Office of Coastal and Aquatic Managed Areas, State of Florida Department of Environmental Protection. He/she is personally known to me.

Shannon Franklin
Notary Public, State of Florida

Shannon Franklin
Print/Type Notary Name



Shannon Franklin
MY COMMISSION # DD119914 EXPIRES
May 23, 2006
SCALED THRU ROYAL INSURANCE, INC.

Commission Number: DD119914

Commission Expires: May 23, 2006

CONSENT TO ASSIGNMENT AND ASSUMPTION OF LEASE

The BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, the Lessor of the property described in the Lease consents to the foregoing Assignment and Assumption of Lease this 22nd day of December, 2003.

BOARD OF TRUSTEES OF THE INTERNAL
IMPROVEMENT TRUST FUND OF THE STATE
OF FLORIDA

BY: Gloria C. Nelson (SEAL)
GLORIA C. NELSON, OPERATIONS
AND MANAGEMENT CONSULTANT
MANAGER, BUREAU OF PUBLIC LAND
ADMINISTRATION, DIVISION OF
STATE LANDS, DEPARTMENT OF
ENVIRONMENTAL PROTECTION

"LESSOR"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 22nd day of Dec, 2003, by Gloria C. Nelson, Operations and Management Consultant Manager, Bureau of Public Land Administration, Division of State Lands, Department of Environmental Protection, as agent for and on behalf of the Board of Trustees of the Internal Improvement Trust fund of the State of Florida. She is personally known to me.

(SEAL)

Theresa M. Brady
Notary Public, State of Florida

Theresa M. Brady
Commission Expires Jan. 2, 2006

Print/Type Notary Name: Theresa M. Brady
Bonds Thru
Atlantic Bonding Co., Inc.
Commission Number:

Commission Expires:

Approved as to Form
and Legality

By: David J. Hemi
DEP Attorney

B.8 / Letter of Compliance of the Management Plan with the Local Government Comprehensive Plan

This management plan is in compliance with St. Johns and Flagler County's Comprehensive Plan. The plan is intended to be in compliance with the State Lands Management Plan, adopted March 17, 1981 by the Board of Trustees of the Internal Improvement Trust Fund and considers balanced public utilization, specific agency statutory authority, and other legislative or executive constraints.

St. Johns County Board of County Commissioners

GROWTH MANAGEMENT SERVICES

4040 LEWIS SPEEDWAY
SAINT AUGUSTINE, FLORIDA
32084



PHONE: (904) 209-0575
FAX: (904) 209-0576

March 17, 2009

Janet Zimmerman, Assistant Manager
GTM National Estuarine Research Reserve
505 Guana River Road
Ponte Vedra Beach, FL 32082

Re: GTM National Estuarine Research Reserve Management Plan dated December 2008

Dear Ms. Zimmerman:

Both the Long Range Planning and Environmental Planning Divisions have reviewed the December 2008 GTM National Estuarine Research Reserve Management Plan to make sure it is consistent with the St. Johns County's 2015 Comprehensive Plan goals, objectives and policies (GOPs). After extensive review of the December 2008 GTM National Estuarine Research Reserve Management Plan as shown on DEP web site at http://www.dep.state.fl.us/coastal/downloads/management_plans/GTM_Draft_081230.pd it has been determined that the GTM NERR Management Plan is consistent with the St. Johns County's 2015 Comprehensive Plan's GOPs.

If you need any further assistance, please feel free to contact me at (904) 209-0615.

Sincerely,

Vickie Renna, Principal Planner
St. Johns County Growth Management Department

Cc: Teresa Bishop, AICP, Long Range Planning Director
Jan Brewer, Environmental Manager

Reference Materials

C.1 / Acronym List

Acronym	Definition
ADA	Americans with Disabilities Act
AIWW	Atlantic Intracoastal Waterway
ANERR	Apalachicola National Estuarine Research Reserve
AP	Aquatic Preserve
ARC	Acquisition and Restoration Council
BBA	Breeding Bird Atlas
BMP	Best Management Practices
BSA	Boy Scouts of America
BTIITF	Board of Trustees of the Internal Improvement Trust Fund
CAMA	Coastal and Aquatic Managed Areas
CARL	Conservation and Recreation Lands
CBRA	Coastal Barrier Resources Act
CDMO	Centralized Data Management Office
CFR	Code of Federal Regulations
CICEET	Cooperative Institute for Coastal and Estuarine Environmental Technology
CR	County Road
CRCP	Coral Reef Conservation Program
CSO	Citizen Support Organization
CTP	Coastal Training Program
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
DEP	Department of Environmental Protection
DHR	Division of Historical Resources
DNR	Department of Natural Resources (now DEP)
DSL	Division of State Lands
EEC	Environmental Education Center
EEL	Environmentally Endangered Lands
EPPC	Exotic Pest Plant Council
ERD	Estuarine Reserves Division
F	Fahrenheit
F.A.C.	Florida Administrative Code
F.A.W.	Florida Administrative Weekly
FCMP	Florida Coastal Management Program
FDACS	Florida Department of Agricultural and Consumer Services
FDOF	Florida Department of Agricultural and Consumer Services, Division of Forestry
FEPPC	Florida Exotic Pest Plant Council
FGS	Florida Geological Survey
FIND	Florida Inland Navigation District
FKNMS	Florida Keys National Marine Sanctuary
FLAIR	Florida Accounting Information Resource
FLUCCS	Florida Land Use Cover and Forms Classification System
FNAI	Florida Natural Area Inventory
F.S.	Florida Statutes
FTE	Full Time Equivalency
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	Fish and Wildlife Research Institute
FYN	Florida Yards and Neighborhoods
GEMS	Gulf Ecological Management Sites

Acronym	Definition
GHG	Greenhouse Gas
GPS	Global Positioning System
GIS	Geographic Information System
GRF	Graduate Research Fellowship
GRMAP	Guana River Marsh Aquatic Preserve
GRWMA	Guana River Wildlife Management Area
GTM Research Reserve	Guana Tolomato Matanzas National Estuarine Research Reserve
IAC	Interagency Advisory Committee
IDSi	International Dark Skies Initiative
LAMP	Lighthouse Archaeological Maritime Program
LATF	Land Acquisition Trust Fund
LBR	Legislative Budget Request
LEED	Leadership in Energy and Environmental Design
LIFE	Learning in Florida's Environment
MAG	Management Advisory Group
MHWL	Mean High Water Line
MLWL	Mean Low Water Line
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MYA	Million Years Ago
NC	Natural Communities
NCB	Northern Coastal Basin
NEFB	Northeast Florida Blueways
NEMO	Non-point Education for Municipal Officials
NERR	National Estuarine Research Reserve
NERRS	National Estuarine Research Reserve System
NMS	National Marine Sanctuary
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NRCS	Natural Resource Conservation Service
OCRM	Office of Ocean and Coastal Resource Management
OFW	Outstanding Florida Water
OPS	Other Personnel Services
PCAP	Pellicer Creek Aquatic Preserve
ppt	Parts Per Thousand
RBNERR	Rookery Bay National Estuarine Research Reserve
SCS	Soil Conservation Service
SFA	Stewardship Focus Area
SHCA	Strategic Habitat Conservation Area
SJRWMD	St. Johns River Water Management District
SOC	Save Our Coast
SR	State Road
SWIM	Surface Water Improvement and Management Plan
SWMP	System-wide Monitoring Program
TMDL	Total Maximum Daily Load
UF	University of Florida
UNH	University of New Hampshire
U.S.C.	United States Code
U.S.D.A.	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VHF	Very High Frequency
WMD	Water Management District

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Public Involvement

D.1 / Citizen Support Organization (CSO)

The Friends of GTM Reserve, Inc. is a non-profit 501(c)(3) CSO that was established in 2001 to support and enhance environmental education, stewardship of natural and cultural resources, and scientific research of the GTM Research Reserve through volunteer initiatives, citizen involvement, and community partnerships. In 2004 this organization merged with the Friends of Guana River State Park with the surviving corporation being the Friends of GTM Reserve. The Friends group raises funds, provides volunteer services, and promotes environmental awareness of the GTM Research Reserve. Becoming a member, making a donation or memorial gift are some of the ways that the public's generosity can benefit the GTM Research Reserve.

D.2 / Management Advisory Group

Management of the GTM Research Reserve is guided by an advisory group. The advisory group is composed of citizen and government representatives. The advisory group is designed to provide for broad and varied representation among the many involved governmental agencies, commercial interests, special interest groups, research and education entities and the general public that became involved during the site nomination process.

Following GTM Research Reserve designation, DEP established a twenty-one member Management Advisory Group (MAG) for advisory input for the long term management. Representation consists of various disciplines that represent the principles, goals and mission of the GTM Research Reserve. Essential representatives are those of the local citizens, local government, co-management entities, private property owners, scientists and environmental educators.

The MAG is currently composed of the following representatives:

- Mayor of the Town of Marineland or his/her Designee
- A Commissioner of Flagler County or his/her Designee
- A Commissioner of St. Johns County or his/her Designee
- A representative of the St. Johns River Water Management District
- A representative from the DEP Division of Recreation and Parks
- A representative from the National Park Service
- A representative from the Florida Fish & Wildlife Commission
- A Commissioner of the St. Augustine Port, Waterway & Beach District or His/her Designee
- A representative of the Division of Forestry
- A representative of the FIND
- Ten citizens among whom there is at least one representative each for the science of estuarine ecology, environmental education and private property owners.
- A representative of the GTM Research Reserve citizen support organization, Friends of GTM Reserve.

DEP requests appointment of the local and state government representatives by the respective agency/office which they represent. The private citizens are appointed by the MAG, from nominations solicited from the public at-large. Citizens from both St. Johns and Flagler counties will be appointed.

The MAG charter is maintained by the MAG and includes provisions such as: the length of terms of office of MAG members; the establishment of appropriate ad hoc subcommittees to address pertinent subjects such as environmental education and scientific research; and all the other procedural functions of the MAG.

The length of the initial terms of the private citizen advisory group members is three years. These terms are staggered to facilitate a smooth transition in the MAG membership for continuity of GTM Research Reserve operations.

Table 12 / Management advisory group membership.

GTM Research Reserve Management Advisory Group

Name	Affiliation
Mark Arnold	Jacksonville resident
Barbara Battelle	Palm Coast resident
Barry Benjamin	St. Augustine Port, Waterway, and Beach District
Christopher Benjamin	St. Augustine resident
Douglas Carter	DEP, Division of Recreation and Parks
Thomas W. Cheyne	USDA Natural Resources
Mark Crosley	Asst. Executive Director, Florida Inland Navigation District
Michael Cullum	Director, St. Johns River Water Management District
Jim Darby	Chair, Flagler County Board of County Commissioners

Name	Affiliation
Justin Ellenberger	Florida Fish & Wildlife Conservation Commission
David Miles	City of St. Augustine
Jim Netherton	Mayor, Town of Marineland
Pierre Pierce	St. Augustine resident
Ben Rich	Commissioner, St. Johns Board of County Commissioners
Richard Rubino	Palm Coast resident
Kelly J. Smith	Jacksonville resident
Frank Usina	St. Augustine resident
Susan Van Hoek	St. Augustine resident
Gordon J. Wilson	Superintendent, National Park Service

D.3 / Public Meetings, Minutes and Comments

Four general public meetings and three Management Advisor Group Meetings were held to allow for public comment and input into the development of this management plan. All meetings were public and conducted in accordance with **Florida's Government-in-the-Sunshine Law** (§286.011, F.S). Draft copies of the plan were also provided to all interested parties and were available for downloading from the DEP CAMA website (<http://www.dep.state.fl.us/coastal/sites/gtm/plan/>) beginning in August 29, 2007.

Table 13 / Public meeting dates and locations.

Public Meeting Schedule

Meeting Type	Date	Location	F.A.W.
Management Advisory Group	September 13, 2006	Ponte Vedra Beach	32(34) August 25, 2006
General Public	November 1, 2006	Marineland	32(39) September 29, 2006
General Public	November 2, 2006	Ponte Vedra Beach	32(39) September 29, 2006
Management Advisory Group	January 24, 2007	Marineland	32(51) December 22, 2006
Management Advisory Group	May 16, 2007	Ponte Vedra Beach	33(16) April 20, 2007
General Public	September 26, 2007	Marineland	33(33) August 17, 2007
General Public	September 27, 2007	Ponte Vedra Beach	33(33) August 17, 2007

D.3.1 / First Management Advisory Group Meeting

Management Advisory Group, September 13, 2006, Ponte Vedra Beach

Guana Tolomato Matanzas National Estuarine Research Reserve
 Department of Environmental Protection Management Advisory Group

Meeting Summary / September 13, 2006

Members Present	Members Absent
Jim Darby, Flagler County Commission	Barry Benjamin, Augustine Port Authority
Jim Darby, Flagler County Commission	Mark Crosley, Florida Inland Navigation District
Justin Ellenberger, Guana River Wildlife Mgmt. Area	Jim Netherton, Town of Marineland
Pierre Pierce, Friends of the GTMNERR	Greg Ihle, Dep. of Agricultural & Consumer Services
Gordie Wilson, National Park Service	Susan Van Hoek, Citizen Appointee
David Miles, City of St. Augustine	Christopher, Citizen Appointee
Renee Paolini, Recreation and Parks	Frank Usina, Citizen Appointee
Michael Cullum, St. Johns River Water Mgmt. District	
Ben Rich, St. Johns County Commission	
Karen Taylor, Citizen Appointee	
Richard Rubino, Citizen Appointee	
Kelly Smith, Citizen Appointee	
Anne Wilson, Citizen Appointee	
Barbara Battelle, Citizen Appointee	
Mark Arnold, Citizen Appointee	

Others Present

Ellen O'Brien	Kelly Samek
Brian Paradise	Karen Bareford
Lynne Paradise	Stephanie Bailenson
Tom Cheyne	
Laura Herren	

GTMNERR Staff

Janet Zimmerman	Rick Gleeson
Carroll Kissam	Martin Healey
Matt Love	Forrest Penny

Item 1: Call to Order and Pledge of Allegiance.

The meeting of the Guana Tolomato Matanzas National Estuarine Research Reserve Management Advisory Group (GTMNERR MAG) was called to order at 6:10 p.m. by Chairman Jim Darby. Audience and Board stood for Pledge of Allegiance.

Item 2: Determination of a quorum (7 or more MAG Members).

GTM Secretary Carroll Kissam took the roll, and then determined there was a quorum as more than the minimum number of 7 MAG members was present.

Item 3: Introduction of MAG Members, others present.

Introductions were conducted.

Item 4: Report on MAG Appointments.

Carroll Kissam gave an update on the two new members of the MAG, Dr. Barbara Battelle and Mr. Mark Arnold. There is one more vacant seat to be filled. That vacancy has been submitted to Senator Jim King's office. There are 3 members whose terms will end in spring 2007, Anne Wilson, Karen Taylor and Susan Van Hoek. Chairman Darby requested that staff contact these members to ask if they would like to continue to serve.

Item 5: Announcements by Chairman Jim Darby

No announcements at this time.

Item 6: Update on Vacant Environmental Administrator (EA) Position

Stephanie Bailenson announced the resignation of Ken Berk in late August, and Andy Flajole is the Acting Manager during the transition. She apologized that individual notice was not sent to the MAG members. She discussed the recruitment process, and expects to have an EA soon. She invited input from the MAG members. David Miles requested a copy of the EA qualifications. Ben Rich asked about the nature of the resignation, regarding possible political pressure. He requested a letter or report from DEP/CAMA regarding this. Stephanie Bailenson assured there was none. Chairman Darby asked to establish the agenda for discussion. After discussion among the MAG members, a consensus was reached to withdraw the request for a report from DEP to the MAG members. Mike Cullum made the motion to send a plaque to Ken Berk in appreciation for his service to the GTMNERR, seconded by Mark Arnold. The motion was amended for a framed letter of appreciation. A committee of Mike Cullum and Ben Rich was appointed to draft the letter for the MAG group approval. Donations were accepted to pay for the plaque.

Item 7: Update on Management Planning Process

Stephanie Bailenson outlined the planning process for the GTMNERR management plan, including input from the MAG group, and the general public. Then she introduced staff members Karen Bareford and Kelly Samek. Karen Bareford explained the handouts distributed, and then emphasized key dates on the Management Plan Development Calendar. There are particular dates that are pertinent to the MAG members. A private firm has been contracted to run the public scoping meetings and to facilitate the process. Discussion centered on meeting notice and presentations to the local governing bodies, especially Flagler and St. Johns County Commissions. Andy Flajole was asked to handle these contacts. Kelly Samek spoke on the legal process regarding the management plans, CAMA and aquatic preserves. The management plans should serve as guidance documents for internal decision making to manage the resource. Rule making, including penalties and enforcement, is a separate, but closely aligned issue. Ellen O'Brien questioned whether this process favored the public or the management. Discussion centered on the fact that this new way of doing things that would benefit CAMA and the public within the Florida Administrative Code. This public process has very detailed procedures that include workshops and public hearings. Stephanie Bailenson noted that the difference between the aquatic preserves and the NERRs is very confusing to the public. Dick Rubino inquired if the management plan documents and the rule documents would amplify each other. The impacts of the Sunshine Law upon the MAG members were emphasized, discussed, and clarified. Then the discussion centered on the management plan, the rule making process, and the relationship to the MAG. The procedure for the MAG to take an official position was outlined. The difference between a public

position and a private opinion was discussed. The MAG has a responsibility to the public to oversee various aspects of these processes. A means to accommodate public comments at opportune times during MAG meetings was discussed. The time length of the various meetings was discussed. There is a need to check on the legislative requirements for MAG special meetings or workshops. There was discussion regarding time involved for the various meetings. The next MAG meeting was set for January 24, 2007 at 6pm at the Marineland location.

Item 2A: Approval of Minutes (added)

Mark Arnold made a motion to add the minutes from the June meeting to the agenda. Ben Rich seconded the motion. It was voted on and approved. Dick Rubino made the motion to approve the minutes from June 14, 2006, as read. Ben Rich seconded the motion. It carried unanimously.

Item 6: (continued) Draft Letter for Ken Berk.

The draft letter was circulated among the members. An amendment to the previous motion was made by Mike Cullum to approve the draft letter as presented, seconded by Karen Taylor. Staff was directed to prepare and frame the letter. The amendment and main motion carried unanimously.

Item 8: 259.032(10)(b) Requirements for Land Management Plans

Marty Healey, GTM Environmental Trainer requested the MAG add a non-voting member for the duration of the Management Planning process. Statute requirements include a representative of the Soil and Water Conservation District. USDA Natural Resources Conservation Service, District Conservationist, Tom Cheyne, was introduced. He outlined the agency role, the relationship to the planning process, and his background. Ben Rich made the motion to include Tom Cheyne as a non-voting member of the MAG, seconded by Karen Taylor. Discussion followed on the statutory requirements and temporary status for the duration of the Management Plan development only. Justin Ellenberger asked who would represent the local conservation organization. Janet Zimmerman said that requirement was met by the Friends of the Reserve group. The motion was carried unanimously.

Item 9: Reports by MAG agency partners: current projects, issues, needs.

Justin Ellenberger, Fish and Wildlife Commission, Guana River Wildlife Management Area (GRWMA) - On September 30th there will be the 2nd Volunteer Workday to coincide with the National Public Lands Day. It also coincides with GTMNERR National Estuaries Day. They hope to have an invitation to bid out to begin restoring the 25 acre MacNeil's Pond. A 200 acre prescribed burn was conducted this summer, and lightning caused a small fire in June. Recreational improvements continue to progress. Hunting season is upcoming. A private citizen donated a one acre tract of lakefront property.

Mike Cullen, SJRWMD – They are doing bacteria sampling, watershed modeling in the Northern Coastal Basin Area, salt marsh vegetation coverage, continuing TMDL coordination, shellfish and juvenile fish research and monitoring.

Renee Paolini, Washington Oaks Gardens State Park, Faver Dykes State Park, Division of Recreation and Parks- They are beginning development of Mellon and Jordan Islands by volunteers. This will include signage, nature trails, primitive camping, and picnic tables.

Item 10: MAG citizen member reports on issues, events, or ideas on GTMNERR implementation

Introduction:

Ellen O'Brien, Ponte Vedra Riding Club member

Brian Paradise, Sierra Club

There were no comments on Item 10.

Item 11: GTMNERR Activities.

Janet Zimmerman, Education Coordinator – New staff member, Diana Eissing, Events Planner, to bring in more activities to the Center. Community awareness is a constant issue. The Center has become a polling place for Elections. Out of 373 voters in the Primary Election, over 100 people visited the Center. School group programs are for 4th, 7th and High School grades. Volunteer-led programs have been developed for other grades. This doubles the number of school groups able to visit the Center. Upcoming activities include an Artist's reception, for Nancy Asbell, Friday September 15th, hosted by the Friends' Group. September 16th is the Coastal Cleanup Day, with several locations throughout the Reserve beaches, and the beaches of Johns and Flagler counties. National Estuaries Day and the one year anniversary of the Center will be celebrated on September 30th, with similar activities as the Grand Opening.

Marty Healey, Environmental Trainer- Coastal Training Programs (CTP) upcoming include: Dock Workshop with NOAA and DEP/NE District, Dock and Pier Workshop for residential docks, and Green Lodging Workshop. There is a grant contract with FSU and the Florida Sea Grant program to assess the needs of elected and appointed officials. He also has plans to reestablish the CTP Advisory Group.

Rick Gleeson, Research Coordinator- Reported on the 2 graduate research fellows, one from the University of Virginia, studying salt marsh nutrient levels, the other from the University of Massachusetts, studying the over-wintering patterns of bluefish. At Pellicer Creek the weather station and the water quality site are on satellite telemetry. This is part of the NERRS system initiative for nationwide real time access. There were 2 interns this summer, Melissa Williams, USF, and Karen Ford, Menendez High School science teacher. Melissa, a Hollings

scholar, presented her project at the NOAA headquarters in Silver Spring, Md. Karen is developing the SWMP data into a curriculum for students. Both helped with other activities. Rick Gleeson participated in the Strategic Committee for the NERRS program in Silver Spring, reviewing & prioritizing programs for next year's action plan. The project with SJRWMD, studying emergent vegetation in the northern section of the Coastal Basin, is going very well, and should wind up by the end of December. The Southeast Coastal Ocean Observing Regional Association meeting was held last week in Jacksonville. Jonathan Brucker, research assistant for 3 years, has left for another position. The new research assistant, Katie Petrinec, will start in October.

Andy Flajole- Facilities/Operations- The EEC will be a polling site for the November Election. Keeping the EEC outside areas clean after school group lunches is important

The largest accomplishment is the on-time, under budget, completion of the dock project.

It will serve as a Research, Education, Stewardship, and Law Enforcement tool. The project included shoreline restoration, and landscaping the surrounding area with native plants. The draft thank you letters for the St. Johns County Sheriff's Office (SJCSO) and the Friends of GTMNERR were presented. The letters were read by Chairman Darby. The correction was made for the sheriff's name. A motion to approve both letters was made by Ben Rich, seconded by Gordie Wilson. The motion carried unanimously.

Forrest Penny – Stewardship- One of the current challenges is dealing with illegal activities on the western boundary and marshes of the Reserve. We are working with the SJCSO, and signage will be posted soon. Joe Burgess is our new Park Ranger. He has completed the park naturalist program, is a herpetologist, a former DEP employee, and brings lots of experience to the program. The Eagle Scouts are working at Shell Bluff Landing on a new kiosk and on the boardwalk repair. They will be building panels for the beach walkovers for education and interpretation signs. The Australian spotted jellyfish, a new invasive species, was discovered in Guana Lake. We are working with the Lighthouse Archaeological Marine Program (LAMP) to conserve the large ship's rudder artifact that washed up last year.

Item 12: Public Comment on items not on the Agenda (3 minute time limit each speaker)

Brian Paradise, Sierra Club- He considers Mr. Berk a dedicated public servant; is concerned that he was forced to resign, and would like for the MAG to inquire into the circumstances, so that a new administration would not be subject to local political pressures.

Jim Darby – spoke regarding his conversation with Mr. Berk. Mr. Berk made no reference to his resignation other than he enjoyed his service, his contribution and his commitment to the Reserve. He enjoyed working with the MAG.

Ben Rich – concurred with Chairman Darby. He suggested the concerned citizen could contact Mr. Berk directly.

No other comments at this time.

Item 13: Adjournment

The next MAG meeting will be Wednesday, January 24, 2007 at 6PM at the Marineland location.

Motion to adjourn made by Anne Wilson. No objections.

Meeting was adjourned @ 8:35PM

Next meeting: January 24, 2007 at the GTM Reserve Marineland office, 9741 Oceanshore Blvd, St Augustine, FL 32080. Phone 904-461-4054.

Minutes Approved January 24, 2007

D.3.2 First Set of General Public Meetings

General Public, November 1, 2006, Marineland

General Public, November 2, 2006, Ponte Vedra Beach

Attendance

Last	First	Agency, Organization or Company	1-Nov-06	2-Nov-06
Abel	Christina	Times Union, Shorelines	x	x
Altman	Bonnie			x
Altman	J.R.			x
Anderson	Carrie			x
Applegate	Sandi			x
Baer	Crystal			x
Bailey	Clark			x
Barnes	Bonnie			x
Barry	Tom			x
Bass	Tracy			x

Last	First	Agency, Organization or Company	1-Nov-06	2-Nov-06
Bentzien	Michael			x
Berber	Ron			x
Berish	Scott	FWC		x
Berning	Mary			x
Bevan	Denise			x
Beville	Shelley	The Nature Conservancy	x	
Brandon	Blake			x
Brandvold	Steve	St. Johns County Horse Council		x
Brockmeyer	Ron	SJRWMD	x	
Browden	Carrie			x
Brown	Douglas			x
Brown	Lynn			x
Cardenas	Carlos		x	
Cardenas	Davron		x	
Carter	Douglas	DEP / Washington Oaks Gardens State Park	x	
Carver	Margaret			x
Catallo	Sandra			x
Coleman	Bill			x
Crane	D.C.			x
Crawford	Paul E.			x
Csencsits	Brenda			x
Davis	Leile Baruch		x	
Day	Chuck			x
Deal	Cynthia			x
DeSelding	E. B.			x
Dodson	Tara	St. Johns County	x	
Doherty-Nowaczyk	Lisa		x	
Dunlop	Katherine			x
Eastman	Scott			x
Ellenberger	Justin	FWC	x	
Essig	Dani			x
Fanning	Barbara		x	
Fitzgerald	Kristen			x
Flake	Felice		x	
Flake	Greer		x	
Gardner	Gayle			x
Gerald	Lee			x
Geselbracht	Laura	The Nature Conservancy	x	
Getsinger	George	NOAA Fisheries	x	x
Gleeson	Richard	DEP / CAMA	x	
Godwin	David	FWC	x	x
Green	Beverly			x
Gurick	Cathy			x
Gyle	Maxine			x
Hagenbuch-Reese	Deborah			x
Hamilton	Patrick		x	
Hankinson	Gail			x
Harkens	Dotty			x
Harrison	Jerry			x
Harrison	Linda			x
Harvey	Kristina			x
Heckman	Cheryl			x
Height	Alma			x
Hortman	Matthew	FWC		x

Last	First	Agency, Organization or Company	1-Nov-06	2-Nov-06
Houbestad	Ron			x
Hucks	Charles			x
Hucks	Margaret			
Jersin	M.			x
Kaplan	Jennifer			x
Kelley	Diana D.			x
Kern	Jacqueline			x
Kern	Jim			x
Kessler	Bob		x	x
Larson	Tom	Sierra Club		x
Lockhart	Dan		x	
Lockhart	Sara		x	
Lohman	Gordon		x	
Lohman	JoAnn		x	
Mackey	Jean			x
Mander	Mitchell			x
Maxwell	Cliff	Florida Park Service	x	
McCandless	Greg M.			x
McClellan	Joanne			x
McDonald	Jane			x
McKellop	Phillip			x
Militello	Elaine			x
Mirabella	Kailen			x
Miralia	Quilla			x
Miskinis	Janet			x
Monty	Jamie	DEP / CAMA		x
Murphy	Pam			x
Netherton	Jim	Town of Marineland	x	
O'Brien	Ellen			x
O'Brien	Ray			x
O'Brien	Ellen	Ponte Vedra Riding Club	x	x
O'Connor	Gil			x
Padgett	Triss			x
Palmer	Don			x
Paradise	Brian		x	x
Penny	Forrest	DEP / CAMA	x	
Perreault	Terri	St. Johns County Horse Council		x
Pierce	Pierre	Friends of GTMNERR	x	x
Pitman	Jack		x	
Powell	Rebecca			x
Reed	Diane			x
Rich	Andrew	NPS	x	
Ringeisen	Hal			x
Roberts	Lindy			x
Robinson	Nicole	DEP / CAMA	x	x
Robinson	Carole			x
Rosenstein	Traci			x
Royal	Cathy			x
Sabol	Mark			x
Saffles	Charlie			x
Scarlett	Victoria			x
Sedlak	Kenneth, Jr			x
Sedlak	Kenneth, Sr.			x
Segers	Beth			x
Sherwood	Donna			x

Last	First	Agency, Organization or Company	1-Nov-06	2-Nov-06
Shuler	Teddy			x
Simms	Judy			x
Slayton	A.G.			x
Spires	Jennifer			x
Stein	Erin			x
Stockton	Peyton			x
Sutton	Jim	Florida Times-Union	x	
Szanto	Gloria			x
Tancreto	Linda			x
Tarbox	Lori D.			x
Taylor	Karen		x	
Taylor	Gerri			x
VanMeter	Anne	CCOW		x
Wainwright	Sara			x
Walker	Linda			x
Walker	Sam			x
Wamser	R.			x
Weed	Martha V.			x
Wells	Mary E			x
Wells	Virginia			x
White	Susie			x
Whitford	Marilyn			x
Wiles	David	SACA	x	
Wilson	Gordon	National Park Service		x
Wraithmell	Julie			x
Zeltvay	Paul			x

Formal Public Meetings:

November 1, 2006, **Marineland**

November 2, 2006, **Ponte Vedra Beach**

Public Comments:

Name (optional): Ellen O'Brien

Date: Nov 1, 2006

Address: 102 Lands End, Ponte Vedra Beach, FL 32082

Email Address: SANDACREFARM@AOL.COM

Telephone: 904-273-9325

1. What do you think are the biggest issues on the Guana River, Pellicer Creek, and GTM Preserves/Reserve?

Please encourage recreational activities. Please be user-friendly.

2. How could we best address these issues?

Employ management that truly feel they are "public servants"

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

GTMNER Reserve needs to improve on welcoming various user groups.

Name (optional): Anonymous

10. Other comments

I strongly feel that NERR should increase the existing 40,000 aquatic (submerged lands) + 12,000 acre lands to much more. Clearly these numbers are not enough and should be increased to reflect a positive percentage that is above the average.

Name (optional): Anonymous

1: What do you think are the biggest issues on the Guana River, Pellicer Creek, and GTM Preserves/Reserve?

Development pressure is forcing a conflict between recreation and conservation. St. Johns County must use proper planning rather than using conservation lands.

2. How could we best address these issues?

Strengthen your resolve toward preservation and withstand political pressure.

3. What opportunities should be considered in the new management plans for this aquatic preserve?

Coordinate research with UF Whitney, SJRWMD and reach out to them. As well approach local governments at the change of administrations. Offer reviews of environmental impacts.

4. Do you have comments that deal with the way the natural or cultural resources are being managed? (RM)

Make environmental integrity first priority if it conflicts with recreation, hold strong! Leave burial mounds alone. Do not dig up and study other's ancestors. Do not encourage over use of the resource. Do not make it a tourist attraction.

5. Do you have comments that deal with the way the resources are being researched, assessed and monitored? (ES)

Proactively approach polity makers to share research that may guide policy.

Name (optional): Jack Pitman

Date: 11/7/06

Address: 13 Wendy Ln., Palm Coast, FL 32164

Telephone: 386-446-2511

4. Do you have comments that deal with the way the natural or cultural resources are being managed? (RM)

Reference principles of management second bullet of handout titled Coastal and Aquatic Managed Areas. Instead of "Encourage sustainable public access" I would recommend "Establish and maintain public access." This is a much stronger commitment to the subject of public access.

10. Other comments

Subject is the Gulf of Mexico:

Reference Key Responsibilities fifth bullet of interest - out titled Coastal and Aquatic Managed Areas. Just as Massachusetts, New Hampshire and Maine work with New Brunswick and Nova Scotia, Canada to preserve the Gulf of Maine; it makes sense for the Gulf of Mexico states communicate with Mexico on preservation efforts for the Gulf of Mexico - same waters, same gulf.

Name (optional): Doug Carter

Date: 11/1/2006

Address: 6400 N. Oceanshore Blvd., Palm Coast, FL 32137

Email Address: Douglas.Carter@dep.state.fl.us

Telephone: 386-446-6780

3. What opportunities should be considered in the new management plans for this aquatic preserve?

CAMA should consider working with Rec + Parks + others to develop a plan for safe boating and appropriate boater use of Pellicer Creek. The creek is a State Canoe Trail and heavily used by canoes - speed zones should be considered.

Input on GTMNERR management - Anonymous

• 11/2006, from 2 people

1. Biggest issues on Guana R., Pellicer Ck, & GTM Preserves/Reserve

Development and recreational use pressures...stormwater runoff & septic tanks, boating, pressure to build or supersize marinas, personal docks, rec. fishing, rec. boat landings on undeveloped shorelines, equestrians, bicyclists, even hikers.

Pressure from local government to site facilities or infrastructure on conservation lands. This is entirely inappropriate. The public or grants have already paid for this type of land with an understanding and expectation of permanent conservation of the natural resource.

2. How could we best address these issues?

Stick to your subagency's mission. No rec in that statement. Successfully resist Ballard's special friends' pressures. Explain what "low impact" really means b/c public obviously unclear on this.

Interpret to user groups what the cost/impact of their use actually is. People are in denial about their recreational impacts. From rec fishermen (there's so many it has an impact) to equestrians calling their activity "low impact" to one beach walker allowing his or her dog off leash through a bird colony.

Develop a rec carrying capacity based on natural resource priorities (not political pressure) . Enforce. Use to inform decisions.

3. What opportunities should be considered in the new management plans for this aquatic preserve?

Opportunities for fish and other wildlife to be let alone. It should not be all about human use. GTMNERR's mission is about the natural resources, no? It's not about pandering to key political supporters or user groups.

Pressure FWC to support 100% feral hog removal--this destructive, number 1 invasive animal threat to Florida natural communities must go. As peninsula of GWMA and uplands portions of GTMNERR are isolated by development, take advantage of the upcoming opportunity to exterminate feral hogs in this 10,000 acre natural preserve. You'll need to pressure FWC to support this b/c one of their constituencies, hog hunters, may oppose.

Reintroduce scrub jays. They were eliminated recently from this site (in the 1980s-90s) and the greater Guana ecosystem could house a self-supporting population. There's enough habitat between NERR and WMA to do this. This species is on a trajectory to extinction without active intervention.

6. [sic] Do you have comments that deal with the way natural or cultural resources are managed? (RM)

Manage for the resource, not for political expediency.

The natural communities requiring active management (e.g. scrub, marsh, flatwoods) have not been receiving enough. Agency leadership needed. Existing site team is under-staffed & under-supported.

5. [sic] Do you have comments that deal with the way the resources are researched, assessed and monitored? (ES)

Terrestrial—increase attention. For example, what impacts to natural communities are caused by feral hogs and invasive armadillos? (e.g. diseases, nutrient cycling, understory composition/structure, small animal communities.)

Terrestrial & estuarine & marine--How are you researching or monitoring recreational impacts? If you aren't, perhaps you should. Do not build further rec infrastructure unless you have a solid understanding of the impacts.

6. [sic] Do you have comments that deal with the way the community is educated and engaged?. (EO)

Aim for repeat encounters with young children more than high school groups. Inform user groups about their real impacts. Work with user group leadership and industry publications to engage user groups about impacts and etiquette.

7. Do you have comments that deal with recreation, tourism, and public use or access? (PU)

People do not need total access in order to appreciate resources. Hikers, bikers, and equestrians appear agreeable to maintaining existing trails w/o expansion, however, recreational use should be secondary to resource preservation.

Do not develop any more recreational infrastructure. Rec is not the NERR mission. Research into rec impacts could improve flexibility here.

8. Do you have comments that deal with legal, regulatory or authority issues? (LR)

The public's natural resources are not Bob Ballard's personal play ground, or treasures to bestow upon his friends or political supporters. Career professionals need to stand up to this individual and the system of patronage. Manage for the long-term good of the resources, not for political expediency.

9. Do you have comments that deal with funding or purchases? (capital investments)

Spend limited financial resources on management, research, and staff to accomplish management and research, rather than on infrastructure development.

10. Other comments.

Manage for the overall good of the resource, not for any one user group. The recreational user presence at the public input meeting could leave an impression that equestrians and bicyclists are a majority. They are actually a vocal minority.

The resource managers must discriminate in favor of the resource, and all impacts of users are NOT equal. The notions of "equality" of access and "discrimination" are not appropriate here.

About horse waste: Science may show that you can eat horse dung and drink horse urine, but I'd rather not. What effect do these substances have on a person if introduced via a scratch or a cut? What effect do they have on the environment (e.g. nutrient input, weed introduction)? What about tetanus? I don't want to swim in water with horse dung floating in it.

It is a reasonable expectation not to have to walk in or look at people's pets' poop when recreating on a public beach or trail.

Comments on behalf of Audubon of Florida:

- 1) In addition to water quality research, it is important to us that this and all NERR's are on the cutting edge of research measuring the progress/effects of climate change and sea level rise, and are including this work in their education and outreach efforts.
- 2) Please maintain a vigilant feral hog eradication program on the NERR and in the AP's. While the adjacent WMA, where hog populations are maintained for sustainable hunts, may make this more challenging, it also increases the importance of vigilant exotics management.
- 3) Equestrian access to the beach presents concerns for the resource—including threats to beach-nesting birds and turtles—as well as a significant user conflict. By allowing horse riding on the beach, you would not simply be adding another use to the NERR—you would in fact be allowing beach riding at the expense of other beachgoers who would be discouraged by the presence of horse droppings in areas where families swim and recreate barefoot. While it is unfortunate that equestrian opportunities are disappearing elsewhere in the county, the resource and visitor experience at GTMNERR should not have to bear the burden of absorbing that recreational use.
- 4) Please continue to aggressively pursue the acquisition of strategic inholdings and connections between conservation areas, as identified in the NE Florida Blueways Florida Forever Project
- 5) As mentioned by the Friends of GTMNERR at the public meeting on Nov. 3, we would also be interested in seeing the quantitative results and resource managers' evaluation of the pilot study that allowed equestrian access to GTMNERR this past year.

Thank you for considering our suggestions.

Best wishes,
Julie
Julie Brashears Wraithmell
Audubon of Florida
2507 Callaway Rds. Suite 103
Tallahassee, FL 32303
Ph: 850/224-7546, fax: 850/224.6056

Comments of Northeast Florida Group of Sierra Club on GTM Management Plan

The Northeast Florida Sierra Club is a proud supporter of the protection of our coastal resources and the diversity of wildlife found on our north Florida coasts. Our membership of 1800 families includes members in St. Johns as well as Duval and Clay counties. We would like to present a few comments on the management plan updates as well as user issues at GTMNERR (Guana).

Firstly, the Guana River Marsh Aquatic Preserve Management Plan is out of date and much work will have to be done to bring it up to date. The habitat and wildlife species data is out of date and the information on the management areas needs updating. Updating of current county regulations needs to be added. There is also a need to be consistent with the NERR management plans. There should be more use of GIS technology to delineate areas of environmental sensitivity and wildlife use. A better description of the importance of the Aquatic Preserve/ NERR to the economic well being of the region and protection from natural disasters must be made clear. The local Friends groups are not given enough guidance and resources to deliver the message of resource protection to the community and local leaders.

Sierra Club's greatest concerns regarding the management issues are:

1. The lack of scientific data relating to the effects of human activities on the estuarine processes and:
2. The effects of actions taken by public officials, regulators, and the general public on Guana.

We do not understand why the protection of Guana is a matter of greater concern for citizens and environmental groups than the designated conservators of Guana.

During the last decade, this last remaining natural area along our north Florida coastline has seen continuous struggles over land use alternations and damage to the Guana's habitat and biodiversity. How is it that misinformed and imprudent groups constantly challenge the protection and ecological integrity of this great area? We expect our state and federal resource managers to develop a better appreciation of the importance of Guana to the community and to stand up for its protection. Our monetary support as well as political support is for the environmental benefits of Guana to be enhanced and not degraded over the decades.

The latest demand for equestrian use which would impact the upland scrub, dunes and beaches of Guana is another in a string of user demands which will strain these resources and cause damage to the Guana. We oppose any removal of vegetation to facilitate a new trail for horses or parking for trailers; we oppose the removal of dunes even to widen an existing access to facilitate horse crossovers; and we oppose the effects of horse riding on federally and state listed wildlife such as nesting shorebirds, sea turtles, Anastasia beach mice and upland species such as gopher tortoises all of which are found at Guana and exist there in a protected status.

Sierra Club is concerned about the impacts upon other users such as fishermen, beach swimmers and pedestrians of mingling with horse riders. We believe that the impacts of horses on the beaches and beach users will be no different than that of ORVs on the beaches. Many other public lands are currently open to horse riders in this area. Miles of residential and commercial beach can be available for horse riding. Additional impacts to Guana should not be allowed.

The Sierra Club also recommends that the equestrians that use Guana should equip their horses with tail bags or diapers to avoid the deposit of horse excrement on beaches, and on paths, which interferes with the enjoyment of the beaches and paths by fishermen, hikers, bicyclists, bird watchers, and other persons who wish to commune with nature without stepping on, or riding through, or swimming through, or fishing through, horse excrement. Surely if we expect, dog owners to pick up and dispose of dog excrement we should expect no less of equestrians.

Thank you for your consideration of these comments.

November 1, 2006

Brian Paradise on behalf of Conservation Committee of Northeast Florida Group of Sierra Club

Name: Laura Geselbracht, The Nature Conservancy

Date: November 9, 2006

Address: 2455 E. Sunrise Blvd., #1 101, Ft. Lauderdale, FL 33304

Email: lgeselbrachttnc.org

Telephone: 954-564-6144

1. What do you think are the biggest issues on the Guana River, Pellicer Creek and GTM Preserves/Reserve?

I think that some of the biggest issues for the above preserves/reserve are having:

- A detailed inventory (preferably geospatial) of the resources present and quantitative information on their current status (size, condition and connectivity to the larger system);
- An assessment of threats to site resources (both at the site and coming from surrounding areas) that identifies, prioritizes and quantifies these threats;
- An inventory of actions that will be taken to abate the highest rated threats.; and
- A monitoring program in place to determine how successful the threat abatement actions have been regarding resource protection/restoration.

Without the above information it would be very difficult to ensure the continued health of natural resources at the site and to justify certain management activities that may be required to enable site resources to persist in a healthy state. The above noted inventory of site resources should be viewed not only at the site level, but at regional, state and national levels in terms of their contribution to the regional, state and national "bank" of these resources.

Public use activities occurring at the sites may be irreparably harming site resources. Public use activities should be managed to ensure the long-term health and integrity of site resources. Public use should not be construed to mean that the public may use the resource until it is used up and there is no more left for future generations to enjoy.

2. How could we best address these issues?

The sites appear to require more funding to accomplish the basics noted above, as well as an appropriate level of visitor management.

For questions 3.5, see my answer to question #1 above.

6. Do you have comments that deal with the way the community is educated and engaged? Yes, it may be useful to provide individuals interested in pursuing activities at the site that are not compatible with the long-term health and persistence of site resources with some ideas of how they may accomplish their objectives at more compatible sites. For example, perhaps they could work with their local governments to purchase lands suitable for their activities or encourage private investment in suitable recreational facilities.

7. See my comments to question #6 above.

8. Do you have comments that deal with legal, regulatory or authority issues? Yes, site managers and other appropriate officials must have the authority to manage the sites as provided in site management plans, state laws and regulations. If for any reason, there are deficiencies in the ability to protect site resources as identified in site management plans, adjustments should be made to ensure adequate protection of these resources for the use and enjoyment of future generations.

9. No comments.

10. No additional comments.

Thank you for the opportunity to comment.

Name: John Mampe

I would like the water monitoring and expanded to areas adjacent to the various critical preserves, especially those that are relatively untouched and potentially candidates for future incorporation into public preservation. High on my list would be the Longs Creek area south of Pellicer Creek. It is the buffer between the northern area of Palm Coast and the extensive wetlands to the north, and is one of the favorite fishing areas in Palm Coast area.

Name: Anonymous

Need more leadership. Existing site team is under staffed + under supported. Spend more \$ on management research, + staff rather than an infrastructure dev.

Need to monitor recreational impacts + determine the impacts to resources

Recreation use should be secondary to reserve preservation.

Need scientific data relating to the effects of human activities on the diff. habitats at GTMNERR.

Need to have a detailed inventory of the existing resources + quantitative data on their status.

Name: Carole A. McCleery

We live at the Southern end of the NERR, near Pellicer Creek and the

Pellicer Flats. We are quite concerned about the potential for development along the west side of the waterway and the potential for both runoff and dredging of water access.

The Ginn Corporation owns property on both sides of the Intercoastal and has discussed with their homeowners a possible development on the West side that would involve, among other things, a water taxi. Such a taxi could only reach their lands if dredging takes place. As well, Flagler County has a history of treating submerged lands as tradeable development rights. That is, if one owns 80 acres of land that would presumably support, say, 240 units, but 40 acres are submerged and unbuildable, the developer gets to build the 240 units on the remaining 40 acres. Clearly, this enables rather dense development that would drain pollutants into the submerged, largely estuarine, Pellicer Flats.

We would really like to see NERR take a more assertive position regarding development around the estuary.

Name: Maia McGuire

I have a couple of questions I'd like to see addressed in the management plan:

1. I understand that a parcel of land within the former Guana River State Park (now part of GTMNERR) was donated to the state with the condition that the land be available for use by boy and girl scout troops. I would like to know what options there are for scout troops to backpack/primitive camp on this land.

2. The management plan needs to address the trails use--recently the trails within the GTMNERR (Guana) were changed so horses are allowed on weekends (previously they were only allowed on the trails during the week). As a mountain biker who has enjoyed cycling on the trails on the weekends, I will not be using the park for this purpose if horses will be on the trails at the same time. I'll go to Hanna Park instead.

Thanks.

Name: Thomas Marin,

Orlando, Fl,

Attn: Aquatic Preserves:

As a taxpayer of the State of Florida I support the continuation of horseback riding in the GTMNERR, especially on the beach.

I am a Florida resident. I am a taxpayer and I VOTE!

Name: VICTORIA BRILL

FLORIDA RESIDENT

I AM WRITING IN SUPPORT OF KEEPING OUR BEACHES OPEN TO HORSES. AS A TAXPAYER IN OUR STATE, IT SADDENS ME TO BE CONFRONTED WITH THIS. THE HORSES AND RIDERS DO NO HARM TO THE BEACHES IN ANY WAY AND ARE DEDICATED IN PRESERVING OUR BEACHES FOR FUTURE GENERATIONS TO BE ABLE TO EXPERIENCE THE JOY AND FREEDOM OF RIDING OUR GRAND BEACHES.

SINCERELY

Name: Denise Sistarelli

As a taxpayer of the State of Florida I support the continuation of Horseback riding in the GTMNER, especially on the beach.

If you remember the Sierra Club tried to stop horses in the National Forest and our government said NO to them, please be as strong as our other leaders and tell them NO again.

Thanks

Name: Dorothy Pawluczyk

As a taxpayer of the State of Florida & registered voter at every election, I totally support the continuation of horseback riding in the GTMNER, especially on the beach. There is no reason, neither environmentally nor due to any destructive behavior, for this to stop. This is another attempt to stop access to beaches. It seems to me we should focus more on the continuous building along our coasts which is the most destructive as proven in the repeated attempts to rebuild our shores. Please do not allow this to happen. Thank you,

Name: Michele Yergin

Senior Professional Healthcare Consultant
Pfizer Pharmaceuticals
(800) 838-1838 Voice Mail 80186
(904) 887-2154 Cell

To Whom It May Concern:

This e-mail is to inform you that we are in favor of horseback riding at Mickler's Landing and Guana River State Park.

Also Signed:

Sam Walker Sr. 333-2585
Sam Walker Jr 744-2406
Dr. Bruce Yergin 396-0300
Cathy Yergin

Name: Leroy and Priscilla DeChaine

1035 Front St., Welaka, FL 3219
(386) 467-3779

While I respect the integrity of the Sierra Club, I cannot possibly imagine why they would consider riding horses on our Florida beaches (or any beaches) can be a potential threat to the environment. Horses are vegetarians, and any excrement that may be left on the beach, which would contain grain products, would be consumed by the aquatic life. I know we cannot say that about humans, or the occasional dog that may not have been picked up after.

As a native Floridian, and a tax payer, I ask you to consider carefully what you are proposing, educate yourselves, and realize that "horse people" care very much for our environment and the healthy status of our beaches. We respect the nesting areas of the turtles, and are most willing to lend our expertise in caring for our beaches.

Sincerely,

Name: Kathleen Howell & Shado Riders,

Putnam County, FL

Please vote for keeping horses on the beaches for all equestrians. It is a privilege we horse enthusiasts enjoy so much. Thank you,

Name: Brett Duncan

As a taxpayer of the state of Florida I support the continuation of horseback riding in the GTMNER reserve (THE GUANA) Especially the beach Thank you!!

Name: Penny Wroblewski

As a taxpayer of the State of Florida I support the continuation of horseback riding in the GTMNER Reserve (The Guana), especially the Beach. Please don't take away our way of rest and relaxation by enjoying our beautiful state by doing what we love the most!

Name: Susan L. Salzman

(904) 289-7755

As a taxpayer of the State of Florida I support the continuation of horseback riding in the GTMNER, especially on the beach.

When we went riding on the beach at Micklers Landing we received nothing but positive attention. *Little kids faces lit up* while watching us ride by. While walking our horses next to the boardwalk, *people asked could they pet the horses*. We obliged. *The looks on their faces were priceless*. A couple had just gotten married and were having their reception, *they took the time to come out and pet the horses and even had a picture taken with the groom on one of our horses*. *Families walking on the beach watched us with a smile and complimented our horses*.

We are careful to stay on the outer edge of the crowded area at the end of the boardwalk until we get clear of people then move down near the waters edge. **We are also extremely careful not to enter the areas where there may be turtle eggs. We take time to either remove or cover any "droppings" on the beach.** I bet there are a lot of dog owners who don't do this. I cant say EVERY horse owner is this responsible but neither are the sunbathers/ beachgoers when it comes to littering. I can say that I havent seen riders leave droppings but I can say that I have seen where people have littered.

We are very sensitive not to interfere with enjoyment of the sunbathers and beachgoers. If anything, *I bet most were excited to see the elegant beauty of a horse on the beach*. And, *I bet the kids had exciting stories* to tell their family and friends when they got home.

PLEASE DO NOT TAKE AWAY OUR PRIVILEGE OF BEING ABLE TO RIDE ON THE BEACH.

Sincerely,

Name: Anna Malone

Tuesday, October 31, 2006 3:18 PM

As a taxpayer of the State of Florida I support the continuation of horseback riding in the GTMNER, especially on the beach. Please consider this issue closely and preserve our right to ride our horses on the beach.

Name: Gail Boone

As a taxpayer of the State of Florida I support the continuation of horseback riding in the GTMNER, especially on the beach. Thank You

Name: Jeanne Mahaffey and Clipper (my horse)

To Whom It May Concern:

Close Guanna State Park and Mickler's landing to horseback riding? Please say no to the Sierra Club..no one ever tells this group no enough. Horseback riders have been enjoying these locales long before the Sierra Club ever existed and the horses do not harm the flora or fauna there. Plenty of other states have horseback riding on the beach, so why can't we? Believe it or not horseback riding is very big in Florida and is a multi-million dollar business. Don't you all want to keep this lucrative business coming? By the way, I don't remember that the Sierra Club produces any business. Nope, can't think of a thing they do that actually produces money other then membership charges. Keep the parks open to all as I can assure you that horses do less damage than boats and other personal water craft and dirt bikes. If the Sierra Club wanted to go after someone, why don't they go after the golf courses, one of the major polluters of our aquifers. Oh, that's right, they are all playing golf. Going after horses, well, that is just cowardly.

Name: Janet Metz

900 Walking Horse Lane
Valkaria, FL 32950

I am a taxpaying citizen of the State of Florida and an equestrian. I strongly support continueing to allow horseback riding in GTMNERR.

Name: Anonymous

I am a horse therapist and own 7 horses. Being able to ride on the beach is theraputic for the horses and people. People at the beach like being able to see and sometime touch horses along with it is very relaxing. Please continue letting us enjoy riding on the beach and Guana.

Name: Ellen O'Brien

(904) 710-1215 – cell

I have some more information for you. I spoke with Ms. Nicole Lamoureux, Chief Operating Officer, The American Horse Council, Washington, D.C. (202) 296-4031.

Some interesting statistics:

2005 ECONOMIC INDUSTRY STANDARD

Florida is number three state in the nation (California is 1st and Texas is 2nd) for horse population. At least 500,000 (one half million) horses live in Florida.

Approx 440,000 people are directly involved in the horse industry, i.e. owners, breeders, feed supply, industry supplies, etc.

For goods and services the horse industry generates THREE BILLION DOLLARS annually to an in the State of Florida.

Thanks,

Name: Kim S.

Let the horses stay!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! They're not bothering anyone!!! If they are, tell the people who don't like it to go somewhere else...there's not very many places to take your horse in this area.

Thanks,

Name: Janice Walton

Hello,

We love visiting the Guana Preserve. I have 2 seven year old children who would enjoy more activities geared toward their age. Activities could be after school or on weekends. Hands-on outdoor activities are most enjoyable. Thank you.

Name: Duffy McCoy

Hello,

I am amazed that this question has even come up. This is one activity that draws people to live, work, spend their money and pay taxes here. And you want to take this away? I am sorry I don't see why? What are the horses and people doing that is so bad, so damaging? And you can say that the people without horses that leave trash on the beach are better. What about dogs on the beach? At least horses are vegetarians and their waste products feed the earth.

Name: Joan Gordon

104 Surfview Drive
#2103
Palm Coast 32137

With regard to your planning for the future growth of the GTM Reserve, I have the following observation:

We very much appreciate receiving periodic emails from the GTM Reserve director. We live near the reserve on A1A and we are simply part of the public that benefits from the educational outreach of the GTM director.

Thank you.

Name: Greg McCandless

VP Ribault High School

Folks,

As a Florida taxpayer I hope that you will continue to allow horseback riding at the Guana site. We are good custodians of our state park and state forest system. I would think that you would want active participants of our park system who also care about the health and vitality of the precious flora and fauna systems within the park.

Thanks

Name: Jimmi H. Symonds

(386)328-4416

Please allow the GTMNER and especially the beach areas to remain open to horseback riding. Many of us enjoy riding these areas and appreciate the beauty that our state specifically offers to equestrians. These privileges are even an attraction to out of state riders.

Thank you for your consideration!

Name: Brian Paradise,
13 Arbor Club Drive, Unit #315
Ponte Vedra Beach
Florida 32082-2615

Dear Ms. Coulson,

I have the following comments regarding the revision of the site management plan for the subject site:

1. The area should remain in its existing geographical and ecological state without any alteration of the routing of AIA, or the locating of any non-natural or non-compatible structures such as schools or boy scout camps within the GTMNERR.
2. The horse manure deposited on beaches and trails by the horses of equestrians using Guana should be analyzed to see if it is a health hazard to humans or wildlife.
3. There should be an education program for the public using GTMNERR as to the impacts of visitors on the wildlife and vegetation of the GTMNERR.

Thanks for your consideration of these comments,

Name: Sherri Reinschmidt

I was unable to attend the meeting; however I fully support horses in the Guana and on the beach.

Name: Pam Arn, MD
parn@nemours.org
144 Belmont Drive
Jacksonville, FL 32259

Please keep horseback riding, hiking and biking available to the public in the Guana preserve. My family has taken advantage of this wonderful opportunity on many occasions and I would hate to see it restricted.

Sincerely,

Name: Dawn Jennings

Please include me as supporting the ability to ride horses in the Guana NER. I consider it a privilege that will not be abused.

Thank you very much.

Name: Charles Hegener

You may be familiar with a recent, 11/3 or so, Science article on predictable collapse of the world's fisheries.

As a long time Sarasota resident, I support all efforts at coastal preservation/restoration and growth mgmt, AKA "sustainability".

Thx for your good efforts.

Name: Lou Meuche

1500 Bishop Estates Road, 17A
St. Johns, FL 32259

As a Florida taxpayer I support the continuation of horse back riding in the GTMNER Reserve, and especially on the beach.

Name: Gloria Szanto

Ponte Vedra Beach Fl
904-285-1403

I went to the Nov. meeting:

I am a resident of Ponte Vedra beach who is an equestrian, runner, biker, and hiker,

I have enjoyed hiking, jogging, biking, and riding my horse on Guana Beach and its trails.

I feel lucky to have such a beautiful park so close to my residence and want to help keep it open to the public as a multi-use park.

I am a fulltime ICU RN at St. Lukes Hospital. My job can be VERY stressful: as I care for dying and critical patients and try to console families on a daily basis.

Riding my horse on the beautiful trails and beach of Guana help invigorate me and get me ready to face my job again!

I hope I can continue to use Guano beach and trails for riding, hiking, jogging, and biking. it is such a peaceful and beautiful park!

Thanks so much!

Enjoyed the meeting and look forward to learning more about Guana!

Name: Diana D. Kelley

972 Ponte Vedra Blvd
Ponte Vedra Beach, Florida 32082

Dear Sir,

Please accept my comments on the forthcoming management plan for the Guana River Park in St. John's County.

For the past 10 years, every few years, the equestrian community has had to defend our privilege to ride on the Ponte Vedra Beaches.

We have signatures on a petition from almost every single. beach front home owner in Ponte Vedra from Sawgrass South of Mickler's agreeing with keeping the horse community able to use our beaches.

We have agreed and continued to ride within hours of low tide so not to disturb dunes or turtle nests.

We have agreed and continued to stay away from the beaches when overcrowded during holidays. .

I live on Ponte Vedra Boulevard between Mickler's and Sawgrass.

I drive by Mickler's public access almost every day.

I see that our equestrian community is in keeping with the current recreation department legislation.

I would respectfully ask that the Guana River Park include the equestrian community access to the trails and the beaches in the management plan.

The ability to ride horses on this beach is one of the benefits of living in Ponte Vedra Beach. Our beach is one of the only beaches in Florida that allows riding on the beach, and we would ask that we continue this privilege.

Thank You,

Name: KD Huff

4560 Zambito Ave
Jacksonville, FL 32210

Good morning,

I am an equestrian and taxpayer who lives in Duval County. My friends and I trailer our horses to the many wonderful places afforded us here in Northeast and Central Florida.

Although I have yet to ride the beach at Guana, I have enjoyed beach access in Fernandina and in Crescent Beach. I would just like to add my voice to the many who hope that the beach at Guana will remain open for responsible equestrian use.

Regards,

Name: Amanda Brennan

I am emailing in support of the horses in Guana!

Thanks,

Name: Sandy Mooney

I support horses in the Guana and ask that equestrians continue to ride there.

Thanks so much,

GTM North Meeting:

Name: Don Palmer

14524 Luth Drive S.
Jacksonville, FL 32250

COMMENTS PRESENTED ON NOVEMBER 2, 2006, SCOPING MEETING WITH REFERENCE TO GTM RR MANAGEMENT PLAN BY:

The plan should clearly articulate goals and strategies for the management of the uplands, wetlands (both tidal and nontidal) and the 4.2 miles of undeveloped beach, including the extensive primary and secondary dunes and

interdunal swales, that make GTM NERR one of the most significant natural resources in northeast Florida. The primary goal for the reserve should be to enhance and restore, where required, the varied and complex ecosystems; thus creating an environment that will both uplift and nurture people that will explore the reserve, and provide an educational opportunity and outdoor experience. A very worthwhile objective is to reverse a very troubling trend in this country, that is, to provide an alternative experience to help in the cure of "nature deficit disorder". To assist in the accomplishment of this selected goal, I provide the following suggestions, by no means is this list inclusive.

- 1) The plan should clearly outline a prescribed fire regime for each of the ecosystems found within the reserve. Frequency of fire and timing (season) will vary depending on the ecosystem in question. The objective is to mimic a natural fire regime that will promote the growth of native vegetation; thereby, benefiting wildlife, and reduce the occurrence and growth of invasive plant species.
- 2) The plan should have a component to address invasive plant species, including a monitoring program to detect the presence or spread of invasive plants, and a plan to control such growth if it should occur.
- 3) The plan should address the control of non-native wildlife species, primarily hogs and armadillos. Hogs cause significant soil disturbance that more than likely adversely affects native plant communities, and both species disturb and alter the soil invertebrate communities through their respective feeding behaviors. In addition to these two species, it is also important to address the feral cat issue as well. Currently, there are feral cats found in at least one of the parking lots along AIA, and these animals are predators on small mammals and birds. It is possible they may be having a direct affect on the Federally endangered Anastasia beach mouse which resides in the primary and secondary dunes along the 4.2 miles of undeveloped beach. The plan should also address predation on turtle nests by canids or possibly by raccoons or foxes.
- 4) The plan should discuss hydrologic issues and corrective actions necessary to restore the natural flow of water in the reserve. Through past land management practices, prior to the state acquiring the property, the natural hydrology (timing and duration) was altered. It is very important to restore hydrology to the interdunal swales; thereby insuring that the nontidal wetlands will remain viable and not convert to uplands. It is critical that the land managers be able to manipulate water in the reserve without affecting or being affected by the Florida Fish and Wildlife Conservation Commission that manages the wildlife management area to the north. The problem requires a solution, and as a component of this solution, I suggest the plan discuss corrective measures that could be instituted that may also be helpful in identifying future mitigation projects for off-site wetland impacts. Regulatory agencies, both state and federal, could use the plan to direct prospective applicants to fund corrective measures to satisfy their respective mitigation requirements for wetland impacts elsewhere.

An important component of the management plan should be a discussion involving the human use of the reserve. Towards this end, I believe a passive form of low impact recreation, such as; hiking, bicycling, boating, fishing, equestrian use (under controlled circumstances), etc. should be the goal. The reserve should not be managed for camping or other pursuits that would require the removal of native vegetation thus exposing the affected ecosystems to stress.

I want take the opportunity at this time to discuss a situation that currently requires a statement of concern and should be carefully evaluated within the scope of the management plan and not through political channels. it is in response to a recent news article in the October 18, 2006, Beaches Leader, with reference to the request by the Ponte Vedra Riding Club to Florida Department of Environmental Protection (DEP) to permit equestrian access to Guana beach north. The reason being provided to DEP is that riders must "traverse three miles of county beach before reaching the beautiful Guana beach." I find this request most disturbing and it should be denied without further discussion for the following reasons.

First, the parking lot at north beach will not accommodate vehicles with horse trailers. There will undoubtedly be conflicts with horses being unloaded from the trailers and other vehicles attempting to maneuver around them. This is very much a safety issue, both for humans and horses. Also, there is the issue of space available to accommodate all vehicles that want to use the parking lot. This will more than likely necessitate enlarging the existing parking lot, which will further encroach on the coastal oak-scrub plant community, which is a diminishing resource in northeast Florida.

Second, currently there is no existing trail through the dunes that would permit horses to gain access to the beach. Just north of the existing boardwalk, there is an old footpath through the dunes that is revegetating naturally. I am sure this is the trail the club would want to open up. To use this trail would reverse the healing process that is currently occurring and lead to severe erosion of the dunal system adjacent to the trail. In short, currently there is no available trail from AIA to the beach from the north beach parking lot except for the boardwalk. The only way to gain access is to create a new trail through the primary and secondary dunes. The boardwalk was the least damaging alternative to permit people to access the beach. Encouraging people to access the beach using another trail, other than the existing boardwalk, will only exacerbate an erosion problem and severely damage one of the last remaining natural dunal systems in Florida. The secondary dunes at Guana are among the tallest secondary dunes in Florida. That in itself; is just one of many unique attributes found at Guana.

Third, there are several Federally threatened and endangered species that may be negatively impacted by this proposal. They are the Anastasia beach mouse, an endangered species; loggerhead sea turtle, a threatened species; green sea turtle, an endangered species; and leatherback sea turtle, an endangered species. The beach mouse lives in the primary and secondary dunes and is found at Guana. The trail will eliminate some of this species' habitat, and there is the potential that horses moving along the trail may actually step on and kill an animal. Insofar as the turtles

are concerned, it is possible that horses, while traveling above mean high water to access the beach below mean low water, may step on a turtle nest which may lead to broken eggs or dead hatchlings. There is a turtle nest survey program in place on Guana, but turtle nests are missed from time to time. (These species are also state listed as threatened and endangered.)

The potential for the incidental take (harming or killing) of these Federally listed species will more than likely require the DEP to apply for an Incidental Take Permit from the U.S. Fish and Wildlife Service, in accordance with Section 10 of the Federally Endangered Species Act of 1973, as amended. This is a regulatory process and will require much documentation and public review.

This proposal is just one more attempt to encroach upon GTM NERR. First, there was the attempt to carve out a parcel for a new high school, and now, a special interest group wants to carve out a small piece for their own recreational pursuits. Most importantly the club currently has access to Guana beach either from Micklers Landing to the north or the Gate station to the south. They are not being deprived of the use of Guana beach! The club's only reason for this request is that they do not want to travel on horseback the additional six miles (round trip) to access "...the beautiful Guana beach." They do not need this additional access point to enjoy Guana beach! The plan should clearly stipulate those recreational opportunities that comply with the goals and objectives of effectively managing the resources on the reserve.

Name: Ellen O'Brien

My name is Ellen O'Brien, I live in Ponte Vedra Beach and as a taxpayer of the State of Florida I am here tonight to endorse and encourage CAMA to continue the passive recreation of horseback riding in the GTMNER Reserve. I also endorse the continuation of hiking and biking on all of the Guana trails.

Over one year ago I requested that horseback riding be permitted on the wooded trails at the Dam Site during weekends and holidays. When I spoke with Mr. Bob Ballard, Deputy Secretary of DEP in Spetember, 2005, after some discussion, he initiated a one year 'pilot program' which would monitor horse activities on the wooded trails and the beach. The program at the wooded trails has ended without event, as far as I know. Equestrians continue to peacefully co-exist with multi-user groups.

While we members of the PVRC had three requests of the DEP at that time, we decided to wait until the end of the 'pilot program', and then present our additional requests to DEP for evaluation and consideration.

In a telephone conversation I had with Mr. Ballard some months ago, I expressed some feelings of our members of the PVRC. I indicated to Mr. Ballard "we (equestrians) don't want to be treated specially, we just ask to be treated equally".

The letter I wrote to Mr. Ballard, dated September 13, garnered a lot of publicity, and sadly, a lot of misinformation and inflammatory remarks. I made three REQUESTS, I did not make three DEMANDS.

The picnic table request was granted Our second request for an equestrian trailhead on the grass seemed reasonable to us, given the fact that the visitors to the Education Center have there own parking area, the fishermen have their own parking area, and the hikers and bikers have there own parking area. DEP has informed us that this request must be denied, as there are environmental concerns; and we accept this decision.

My third and final request was for direct access to the Guana Beach. This request is still under environmental consideration. We are aware that all other user-groups have direct access to the Beach, and we equestrians just ask to the treated equally.

There has been much speculation about this last request.. Let me clarify to everyone here, that at no time did I suggest anyone 'bulldoze' the dunes for access. The beach parking lots are almost always empty and need no modification to accomodate horse trailers.

I'd like to say a few words about Mr. Ballard. I have had several conversations with him throughtout this 'pilot program's' year. He has listened to my concerns, thoughts on the issues and to my requests; while we don't always get what we asked for, he listens to me. I have come to realize that Mr. Ballard has an 'open door' policy with the taxpayers of the State of Florida. Any number of times I have said 'thank you' for listening to me; his reply is always the same "no thanks necessary Mrs. O'Brien, I am a public servant, that's my job."

Name: Michael M. Bentzien

4161 Seabreeze Drive
Jacksonville Beach, Florida 32250
November 2, 2006

Re: Comments on GTM National Estuarine Reserve Management Plan

I have the following comments regarding issues and opportunities for management of the Guana-Matanzas-Tolomato National Estuarine Reserve. My experience includes 20 years as a Federal wildlife biologist dealing with endangered species and wetland issues, and 2 years as a volunteer at the Guana Reserve. My comments are primarily directed to management of the uplands, dunes, and wetlands on this Reserve.

The purchase of the Guana Reserve was an opportunity to save a portion of a complete north Florida coastal ecosystem, including undeveloped beach, dunes, coastal scrub, and maritime hardwood hammocks. This reserve

must, to the extent possible, be managed to minimize loss of these habitats which are disappearing along most of the northeast Florida coast. Therefore, management of the reserve should strive to minimize further development and encourage nondestructive, passive human use.

As a Federal Reserve, management is legally required to meet the provisions of the Endangered Species Act of 1973, as amended (Act). Two major requirements of the Act are to consult with the U.S. Fish and Wildlife Service on actions likely to affect listed species, and to utilize Federal agency authority to assist in the conservation (i.e., recovery) of listed species. The Reserve supports a number of federally and State-listed endangered, threatened, and species of special concern. The Reserve staff is aware of the presence of these species, and has worked hard to maintain them as well as to educate the public.

Management opportunities to conserve listed species include maintaining dune habitat for the endangered Anastasia Beach mouse, which was reintroduced to Guana several years ago and is found elsewhere only on Anastasia Island. The Guana beach mouse population has very limited dune habitat available to sustain itself; since Highway AIA cuts off the western side of the dunes. Maintaining dune habitat requires occasional prescribed burning to replicate natural lightning- caused fires Public access should be restricted to existing crossovers and access points. Opening or re-opening sand trails over the dunes should be avoided. Such trails result in loss of vegetation and erosion through blowouts from the prevailing southwesterly winds, thus breaching the dune system.. The beach dunes are also important habitat for hundreds of migrating peregrine falcons, which feed and rest on the dunes.

West of Highway AIA, the coastal scrub vegetation supports several listed species, including the eastern indigo snake, the gopher tortoise, and the Florida mouse. This scrub is also the northernmost known locality in Florida for the giant vinegaroon, an unusual arachnid. These species are relicts derived from the fauna of the Southwest or Latin America. They are of special biological interest, and their scrub habitat requires periodic burns to maintain its integrity.. The staff of the Reserve is aware of the necessity of prescribed burns of this habitat, and of the problems inherent in burning close to human dwellings.

The hardwood hammocks, scrub, and pinelands of the interior support a large number of small mammals, reptiles, and amphibians, as well as dozens of species of migratory birds. The hardwood hammocks are a climax vegetation type, but the scrub and pinelands are a subclimax vegetation types and require burning. This will benefit the resident gopher tortoise population, which is currently most abundant on the edges of hammocks, pinelands and scrub, and in grassy areas near the dam. Control of feral hogs and armadillos should be carried out to benefit both the understory vegetation and the small amphibians, reptiles, and invertebrates that are not adapted to predation from these two disruptive species. Invasive plants are not currently a serious threat, but management planning should provide for monitoring and suitable control activities should this problem arise.

The freshwater marshes in Guana have been altered by mosquito ditching and by water control structures in the adjacent Wildlife Management Area. They provide essential habitat for diverse wading birds and amphibians, notably the rare striped newt and mole salamander. Restoration of more natural hydrology should be continued - current hydrological conditions keep the marshes dry. The filling of old mosquito ditches has improved the situation, but the marshes need to be protected from excessive drawdowns so that they do not succeed to old-field vegetation. Hopefully, a way can be found to provide sufficient water, and to prevent drawdowns for the Wildlife Management Area from affecting these marshes adversely.

The current biological and ranger staff at the Guana Reserve collectively has a great deal of knowledge and experience with these issues, and can be depended upon to provide informed recommendation on these issues. In concert with other expert and public input, I am confident a excellent management plan can be developed and implemented to protect this rare and priceless example of Florida's biodiversity.

Thank you for the opportunity to provide these comments.

Respectfully,

Name: Thomas A. Barry

137 Beachside Drive / S. Ponte Vedra Beach, FL 32082
904-825-0713 / TOMUSNA65@AOL.COM

26 October, 2006

To: Florida Department of Environmental Protection. (DEP)
Subject: Public input to Guana River Aquatic Preserve Management Plan

Enclosures:

- (1) Guana River & GTM NERR Management Plans
- (2) Restoration of ICW at Shell Bluff/Minorcan well
- (3) Improved public recreational use of the Preserve

Dear Sir:

I already submitted an initial input to your contractor, Tetra Tech on 20 October regarding my perceived shortfalls in your existing management plan process based on my review of your existing plans, the 15 year old Guana River & the 8 year old GTM NERR. However, I want to submit all of my issues for the record at the 2 November public meeting.

In addition to the management plan issue, I am submitting two other issues that should also be addressed: Habitat restoration of the ICW bank at Shell Bluff/Minorcan well (A goal in the 1991 plan) and improved public recreational use of the entire Preserve.

Sincerely,

Name: Anonymous

Guana Aquatic Preserve Issue

Issue: To improve public recreational use of the Preserve

Background/Facts:

The existing plans (Aquatic & GTM NERR) indicate use of the Preserve for public recreation including hiking, biking, nature study in the 2400 acre "old Guana State Park" area and hunting, biking & photo/nature study in the 10,000 acre Wildlife Management Area(WMA).

The old State Park area still has the existing marked trails & the GTM staff is doing a good job on educating the public & doing some minor improvements on the trails (New trailhead facility w/restrooms, updated trail markers and a few benches. and a cultural kiosk out on the trails). The trails are very good for biking & biking. The Guana River estuary area is an excellent fishing & kayaking area.

Beach access is provided by 3 parking areas on the west side of A-1-A with dune walk-over to the beach & 1 at the Gate store.

The WMA has no marked trails for hiking/biking and the main road (Hammock Road) is so chewed-up that it is inaccessible for biking. Basically, the WMA is not available for general use unless you have a 4 wheel drive vehicle. It is an excellent hunting, fishing and horseback riding area and 6 mile landing in Lake Ponte Vedra is an excellent kayak launching area.

Discussion:

Assuming that public recreational use is a priority goal for the entire Preserve then several public uses need to be addressed:

1. Implementation of an accessible & marked trail system in the WMA.
2. Improvement of all trail systems to include readily available maps with markers of interest for public self-guide. Interest items include habitat and cultural items. (There is a rich European history in the Preserve.)
3. Implement a marked kayak trail in the Guana River & Lake Ponte Vedra areas.
4. Where should horseback riding occur in the Preserve & on the Beach?
5. The need for more beach access. St Johns County is growing in leaps & bounds & beach access is & will continue to be a hot topic.

Recommendations: If you do not address public access & use of the Preserve, then you may lose it!

Habitat Restoration Issue

Issue: Restoration of Intra-Coastal Waterway ICW) bank at Shell Bluff near the 200 year old Minorcan well.

Background/Facts: A priority goal in the current Guana Aquatic Management Plan (Goal A.3)

Discussion:

There has been little or no progress in accomplishing this goal of restoring the ICW bank. As a matter of fact the bank has suffered from significant erosion at it won't be long before the Minorcan well is damaged. See the attached photos from 10/24/2006.

Because there is no accountability and status reporting in the existing Management Plan process there is no record of why restoration has not been accomplished to save a 200 year old cultural landmark.

Is it DEP mismanagement of resources or the legislature not appropriating resources?

Recommendations: This issue needs to be a priority ASAP!

Public Input to Guana River & GTM NERR Management Plans

Issue: The Florida Department of Environmental Protection (DEP) office of Coastal and Aquatic Managed Areas (CAMA) is conducting a review & requested public input to the Guana River Marsh Aquatic Preserve (Guana River) & Guana Tolomato Matanzas (GTM) National Estuarine Research Reserve (NERR) management plans.

Background/Facts: The state agency, CAMA, is responsible for management of the Guana River & GTM NERR. The current Guana River 10 year plan was dated 1991 & the first 5 year GTM NERR plan was dated 1998.

Both plans include a significant amount of background (I.e. "boiler plate" about the land, the agencies involved, mission statements & purpose, ...etc.). The Guana River plan has general goals & actions but no specifics on who, what, when and with what resources. The more recent GTM plan has some of the same "boiler plate", but it has more specific action plans that are obviously oriented to the start-up of the new GTM facility. Still missing are specifics on

who, what, when & with what resources for most of the action items. Neither plan addresses local public/community issues: GTM access fees not included in state park annual pass; adequacy of beach access & parking; horseback riding on walking trails & beach; improving trails in GTM; investigating, protecting & educating about cultural history of the Guana River area (Spanish & British periods, Minorcans, Civil War,...); etc.

The Guana River area includes the WMA, not controlled/resourced by CAMA, and it's not clear how that area is managed & resourced to provide for general public use (Marking trails & providing access, not just hunting), & how it coordinates these uses with the GTM or the Guana River plans.

There does not appear to be any way for the public to track the status of the management plans implementation of goals & actions. For example: what items were completed & if not completed, why (ie. Not enough resources, change in priorities, . . . etc).

Discussion:

It appears that the plans have not been used as resource management tools to set specific goals, priorities & plans of action that are linked to specific resources (manpower & money) that can be dynamically monitored & utilized during the annual legislative budget cycles. Public involvement in plan of action status has been minimal. The public can be a support asset with the legislature & a deterrent to land "grabs" of unused uplands.

It appears that potentially there could be 3 independent plans covering the 'Guana River area: The Guana River Aquatic Reserve plan, the GTM NERR plan & the WMA plan. It's also not clear who is developing the Guana River & WMA plans and how they will be integrated into one plan that incorporates the resource management issue mentioned above. Plan development has the potential to be a big waste of time & resources.

Recommendations:

1. Follow the "KISS" principle & develop 1 management plan for Guana River Aquatic Preserve. Keep most of the "boiler plate" in the Guana River plan & put the specifics and POA&M in a GTM & a WMA annex.
2. The plan & action items must include current public/community issues (If it is too hard, then state the policy/impacts. Don't ignore it or it will bite you.)
3. Develop a plan that has specific prioritized plans of action (POA&M) linked to/with the resources required to implement them.
4. Provide, as a minimum, an annual status of prioritized POA&M for the plan. The public should be involved in the status of the POA&M. The action plan should be readily available at the GTM.

Name (optional): Pierre Pierce

Date: 2 Nov 06

Address: 104 Falcon Rd, St. Aug. FL 32086

Email Address: PIERREART@ATT.NET

Telephone: 904-794-1522

1. What do you think are the biggest issues on the Guana River, Pellicer Creek, and GTM Preserves/Reserve?

Encroachment of development. No horse / public mix on trails + beach areas. No give away of any part of the reserve

2. How could we best address these issues?

Increased biological studies to document + advise public + policy makers. Until such studies are completed, do not allow piecemeal changes to occur to placate small but vocal groups. More SWMP stations

3. What opportunities should be considered in the new management plans for this aquatic preserve?

Informing public of our goals. Work with local clubs + organizations. Closer contact with media. Bring them into all meetings - local fishing clubs to help.

4. Do you have comments that deal with the way the natural or cultural resources are being managed? (RM)

Do not allow fishing or crabbing by commercial fisherman. More law enforcement at dam area. Require biological studies re: health inviromental, + safty studies before any changes in existing rules + regs. Specifically, dunes, parking lots, land give aways, horse + human interactions.

5. Do you have comments that deal with the way the resources are being researched, assessed and monitored? (ES)

Need more contact with local fisherman + fishing clubs - a great resource to help + and add hands + eyes on the water (inland + offshore)

6. Do you have comments that deal with the way the community is educated and engaged? (EO)

We must increase efforts in this area. Most locals still think this is state park.

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

Bring more groups to GTM. Work with St. Aug. City Tourist Board - Contact people like AAA, airlines + tour group organizers

10. Other comments

Dont let the fact that a whole (horse) club took up most of the comment time. As a board member of The Friends I could have invited 100 or so to come + speak!

Name (optional): Kenneth Sedlek Sr.

Date:

Address: P.O. Box 706 St. Aug. Fla 32085

Email Address: leanertp@yahoo.com

Telephone: 904-669-3520

1: What do you think are the biggest issues on the Guana River, Pellicer Creek, and GTM Preserves/Reserve?

- Law Enforcement -

2. How could we best address these issues?

Paying Overtime For D.E.P. Officers

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

I would like to see the Park stay open at night for fishing. I would like to see the gate stay the way it is (closed at 11 pm to 4 am) But anyone that is in the park can remain

8. Do you have comments that deal with legal, regulatory, or authority issues? (LR)

I would like to see the rules enforced. Fish limits + quantities. I would like to see the people that run the gate get tickets

Name (optional): Brenda Csencsits

Date: 11/4/06

Address: 620 Palencia Club Drive, Unit 203, St. Augustine, FL 32095

Email Address: brendacsencsits@aol.com

Telephone: 904-808-8789

4. Do you have comments that deal with the way the natural or cultural resources are being managed? (RM)

If horseback riding is allowed on the beach, post signs with info + educate riders on what to do in the area of sea turtle nests (whatever the biologists deem important) so that the hatchlings don't get trampled or stuck in horse hoof prints.

6. Do you have comments that deal with the way the community is educated and engaged? (EO)

Keep education programs for children strong.

Increase education opportunities for adults / families.

For families - make GTMNERR a "must do/see" on weekends.

Need more articles published in Florida Times-Union (not obscure little announcement

Name (optional): Lisa Doherty

Date: 11/2/06

Address: 6824 Ave. D. ST. Aug. FL 32080

Telephone: 904-471-0648

1: What do you think are the biggest issues on the Guana River, Pellicer Creek, and GTM Preserves/Reserve?

sharing

2. How could we best address these issues?

meetings / discussions

6. Do you have comments that deal with the way the community is educated and engaged? (EO)

When horses + bikers are in contact w/ each other the horse should be given the right of way + the biker should dismount + lay the bike down

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

Like riding on beach in our county

Name (optional): Anonymous

Date: 11/2/06

1: What do you think are the biggest issues on the Guana River, Pellicer Creek, and GTM Preserves/Reserve?

Balancing competing uses without damaging the resource

2. How could we best address these issues?

Err on the side of protection of the resource

3. What opportunities should be considered in the new management plans for this aquatic preserve?

The goal of use without damage

4. Do you have comments that deal with the way the natural or cultural resources are being managed? (RM)

Try not to be too influenced by the rich or powerful groups or individuals but protect the resources

5. Do you have comments that deal with the way the resources are being researched, assessed and monitored? (ES)

Strive for sound science

6. Do you have comments that deal with the way the community is educated and engaged? (EO)

Great education programs are happening at GTM NERR - Keep it up.

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

It is wonderful to allow recreation and public use, to the extent it does not damage the resources.

8. Do you have comments that deal with legal, regulatory, or authority issues? (LR)

More resources (\$) need to go toward enforcement.

9. Do you have comments that deal with funding or purchasing (Capital Investments)?

I would support tax increases to go to more preservation & protection

10. Other comments

In the southern reach - south of Matanza's Inlet north of Marine Land the county is filling the water with sand / dirt / road base from trying to maintain the Old A1A strip. This constant blow over & overwash from the effort to maintain the road access for those homes is destroying the estuary. Please take enforcement action to stop this destruction of the estuary.

Name (optional): Diane Reed

Date: Nov. 2, 2006

Address: 110 Ocean Hollow Lane #201 St. Augustine, FL 32084

Email Address: dreadster@aol.com

Telephone: 904-829-9854

1. What do you think are the biggest issues on the Guana River, Pellicer Creek, and GTM Preserves/Reserve?

I think we need to work on the trails and that the access groups need to work together.

2. How could we best address these issues?

Continued public issues & discussion.

3. What opportunities should be considered in the new management plans for this aquatic preserve?

I feel that the trails will not be managed properly with the horseback riders.

4. Do you have comments that deal with the way the natural or cultural resources are being managed? (RM)

The trails need to be kept cleaner and more clearly marked.

5. Do you have comments that deal with the way the resources are being researched, assessed and monitored? (ES)

I have a serious issue with horses on the beach and would like to know if there are studies relative to horse manure in the oceans and the impact on swimmers. Is there a health hazard?

6. Do you have comments that deal with the way the community is educated and engaged? (EO)

I have cleaned turtle nests on the beach that contained horse manure on the top of the nest.

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

The trails are not wide enough for the horse riders and the walkers.

8. Do you have comments that deal with legal, regulatory, or authority issues? (LR)

I would like to see the "scientific surveys" that have been performed regarding the pollutants in the ocean.

9. Do you have comments that deal with funding or purchasing (Capital Investments)?

Everyone speaks of the bikers + horse riders, but no one speaks of the walkers and birdwatchers.

10. Other comments

The horse community should have access to different areas of Guana.

Diane Reed
Sea Turtle Patrol
1190 - 2004 Permit
Vilano Beach

Name (optional): Peter Difatto

Date: 11/02/06

Address: 2381 S. Ponte Vedra Blvd.

Email Address: OldestCity@Comcast.net

Telephone: 904-685-2300

1. What do you think are the biggest issues on the Guana River, Pellicer Creek, and GTM Preserves/Reserve?

Actually preserving it

2. How could we best address these issues?

More public education and getting the support of local city, county + state governing bodies. (commissioners, etc.) to make them understand the need to preserve it.

3. What opportunities should be considered in the new management plans for this aquatic preserve?

I would like to see an ongoing speaker program with pertinent, interesting topics that is well advertised.

4. Do you have comments that deal with the way the natural or cultural resources are being managed? (RM)

No. Consider opening up an additional like or walking trail off A1A in the Northern section (possibly along the Guana River (East of it) and other trails in other areas (if they meet the goals of the preserve. For instance connecting the parking lots. Also, I think with the danger of people crossing A1A to get to the beach from the parking areas, ***** should be considered.

5. Do you have comments that deal with the way the resources are being researched, assessed and monitored? (ES)

No

6. Do you have comments that deal with the way the community is educated and engaged? (EO)

No. See above.

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

Re: horses on trail or beach

Large animals and small children on the trails are not a good mix and could result in accidents and personal liability. (continue below)

9. Do you have comments that deal with funding or purchasing (Capital Investments)?

No

10. Other comments

On the beach, the large droppings are offensive especially when one considers that most people are barefoot. It could also be a problem with any animal to human pathogen that could exist. Maybe separate trails for horses could be added.

Name (optional): Bill Coleman

Date: 11/2/06

Address: 3423 Lands End Drive, St. Augustine

Email Address:

Telephone: 904-824-8880

1. What do you think are the biggest issues on the Guana River, Pellicer Creek, and GTM Preserves/Reserve?

Encroachment on reserve Lands

2. How could we best address these issues?

Do not allow it.

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

Use by equestrians must be carefully studied to be certain that there are no negative affects on the reserve. Water should be tested in use areas. Trails should be inspected to determine extent of damage.

10. Other comments

According to other noninterested horse people, crossing a 55 mph+ highway isa major saftey and liability exposure that should be avoided completely.

Name: Anonymous

Implement accessible + marked trail system.

Improve all trail systems to include maps w/ markers of interest for public self-guide. Interest items include habitat + cultural items Including Kayak trails in the Guana River + lake Ponte Vedra areas.

Research directed at indirect impacts to Water Quality.

Name (optional): Mark Sabol

Date: 11/1/06

Telephone: 827-0911

3. What opportunities should be considered in the new management plans for this aquatic preserve?

OVER

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

Is there any way the fishing access at the dam could be open 24/7? It used to be and now the hours have restricted our access.

Name (optional): George Gotsinger

Date: 11/2/06

Address: 202 Hormosa Street, St. Augustine FL 32080

Email Address: THE_GOTSINGERS@BELLSOUTH.NET

Telephone: 904-819-5362

1. What do you think are the biggest issues on the Guana River, Pellicer Creek, and GTM Preserves/Reserve?

Water Quality, Enforcement

2. How could we best address these issues?

Provide comments to resource agency responsible for regulating water quality. Enforce wetland & buffer policy / laws. Provide science based research demonstrating changes in water quality, use this data to enforce regulation / reinforce resource agency

3. What opportunities should be considered in the new management plans for this aquatic preserve?

Research directed at indirect impacts to water quality

4. Do you have comments that deal with the way the natural or cultural resources are being managed? (RM)

Establish sensitive / no access areas based on uniqueness of flora/fauna and importance to over all ecosystem

5. Do you have comments that deal with the way the resources are being researched, assessed and monitored? (ES)

Research should be directed toward demonstrating how changing land-use patterns in the GTMs' watersheds are effecting water quality.

6. Do you have comments that deal with the way the community is educated and engaged? (EO)

- More programs on impt. of wetlands

- Work w/ coastal restoration groups in restoration activities (oyster bars)

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

Limit access to sensitive areas

8. Do you have comments that deal with legal, regulatory, or authority issues? (LR)

Management plan should allow & encourage mitigation activities from state and federal resources agency. Regional offsite mitigation area (ROMA) & in-lieu *** program.

Establish and enforce no wake zone throughout reserve and especially in Intracoastal Waterway

Name (optional): Mary Berning

Date: 11/3/06

Address: 2951 Thunder Road, Middleburg, FL 32068-7172

Email Address: horse-master@juno.com

Telephone: 904-282-0938

1. What do you think are the biggest issues on the Guana River, Pellicer Creek, and GTM Preserves/Reserve?

Public awareness for others' than those in the immediate area of the sites.

2. How could we best address these issues?

Dissemination of flyers in expanded areas. Newspapers other than site locals.

3. What opportunities should be considered in the new management plans for this aquatic preserve?

Horseback access to the beach that is acceptable for all parties. Beach parking is all on the East side. Crossing A1A is a safety factor for all especially as more people move into the areas being developed.

6. Do you have comments that deal with the way the community is educated and engaged? (EO)

This meeting was my first introduction to CAMA. I've never seen any announcement present or in the past. If it wasn't for a friend who was going to attend I would have had no awareness of having the option for input on site issues.

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

I would like to see the continued use of GTMNERR by horse back riders, bikers, and hikers with opportunities for enhancements in accommodations for increased use and access for the public.

8. Do you have comments that deal with legal, regulatory, or authority issues? (LR)

For environmental protection I would like to see partnerships with environmental organizations such as Fish and Wildlife

9. Do you have comments that deal with funding or purchasing (Capital Investments)?

If there are opportunities to purchase additional adjoining uplands, I am in favor of such purchases as development is encroaching upon the lands and will affect the lands in holding now as they push on the fringe.

10. Other comments

Your meeting was informative and well presented.

Name (optional): Carol Nechvatal

Date: 11-4-06

Address: 632 Tara Farms Dr Middleburg FL 32068

Email Address: NA

Telephone: 904-272-6090

1. What do you think are the biggest issues on the Guana River, Pellicer Creek, and GTM Preserves/Reserve?

Keep horses, bikers, + hikers in the Guana. I come from Middleburg, Fla to ride your trails in the Guana, please keep them (the trails) available to all of us the above. As to the Sierra Club spokesman - his concern for the horses being killed on A1A is noble esp. since he had none for the lowly pedestrian. For those of us who travel far, the picnic benches are much appreciated.

Name (optional): Peyton Stockton

Date: 11-2-06

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

Yes, I would strongly encourage horseback riding to continue at the Guana.

Name (optional): Carole Robinson

Date: 11-02-06

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

Yes, biking hicking & horse back riding be continued at the Guana National Reserve. Horses do no damage to park lands.

Name (optional): Bonnie Barnes

Date: 11/2/06

Address: P.O. Box 146, St. Augustine, FL 32085

Email Address: barnes@stjohnsvision.com

Telephone: 904-463-0513

5. Do you have comments that deal with the way the resources are being researched, assessed and monitored? (ES)

I'm hearing that PV residents would like better access from the North end of GTM. Open up Wildlife Mgt. Area.

7. Do you have comments that deal with the recreation, tourism, and public use or access? (PU)

Would like community-type meetings to be at no charge - rather than \$100 use fee

Name: Chuck Day

Special Assignments Writer
Ponte Vedra Recorder
President
Search Write Inc.
136 Ocean's Edge Drive
Ponte Vedra Beach, FL 32082
904-543-0785 voice
chuckday@bellsouth.net
904-543-1261 fax

My comments, for what it's worth:

Plan needs to address inevitable jump in northern county population from now until 2030. Rate of increase will be hard to gauge, and will depend on how fast housing can be absorbed. The SJC School District central office tracks housing. Its current numbers project 81,000 more homes between years 1995-2030, including those already in the ground and occupied; Nicole Cabbage is the district point person, and is a former county planner.

Horse manure on beach is nowhere near the problem some fear, as you noted. My wife and I walk almost daily near Mickler Landing. That's approx. 4 miles north of GTM northern boundary, but I think experiences would mirror what you could expect, especially since commercial stables use Mickler beach access point. The real challenge is doggie do, which is far more visible near swimming points; we use the beach constantly during swimming season.

Coordinating GTM Plan with existing St John County Beach Management Plan is a must. County has identified 170-some access points, many of which are not open or obstructed. Dave Williams is the county director of aquatics and plan author; a good man in my view who is spurring efforts to open access points -- as law requires.

I think it's nice to have horses on the beach, but at what cost? A land bridge at \$3 million (Ballard's #) is pretty pricey, unless you can find private dollars to fund. Maybe the horsey set, which often has the wherewithal, should be asked to ... pony up?

Again, my compliments for a well-done meeting.

Name: Ellen O'Brien

member, Ponte Vedra Riding Club
102 Lands End
Ponte Vedra Beach, Florida 32082
cell phone (904) 710-1215

I am writing to CAMA to discuss what I hope to see included in the revised management plan for the GTMNER Reserve (The Guana).

I would like CAMA to continue the passive recreation of horseback riding. This would include riding on the existing wooded trails at the Dam Site, and the 4.2 miles stretch of Atlantic Coast Beach. There is an historical tradition of horses and their riders traversing these trails since the Guana was purchased by the State of Florida. In fact, the tradition dates back to when Palm Valley was founded, 1908!

I am happy that the 'pilot program' is over (October 15, 2006) at the wooded trails at the Dam Site. I have kept a daily log of usage and have seen a pattern established.

- The trails at the Dam Site and the Beach are virtually deserted during WEEK DAYS throughout the year.
- During the six months of Summer the trails get very sparse activity at the Dam Site on weekends. I see approx 4-6 hikers/bikers on Saturday and 5-8 people on Sunday.
- During the six months of Winter there is some activity at the Dam Site. see approx 25-35 hikers/bikers on Saturday and 30-50 people on Sunday.
- On the Beach during Summer on weekends there are usually approx 25 people at the North Parking Lot, with an occasional max of 75-80 people. The Middle lot gets almost no activity year round. The Beach is deserted on weekdays.
- The Beach is deserted all winter long, except for a few horse riders and the rare fisherman.

NOTE: During this pilot program, the equestrian community has had restrictions put on them: I would like to see ALL RESTRICTIONS REMOVED, EXCEPT FOR HORSES STAYING BELOW THE MEAN HIGH-TIDE LINE. I don't want to 'call in' any more, when I ride on the Beach. (This pilot program is over on Thanksgiving Day 2006).

I would like to urge CAMA to be specific as to the 'designated horse trails' in the GTMNER Reserve. I want to see something like "all existing trails in the Guana wooded trails are open to horseback riding and that the 4.2 of Beach is a designated trail for horseback riding. Please be specific.

I would like to see incorporated within the management plan, safeguards for protecting the multi-user groups from arbitrary rulings by an individual manager. While I understand that CAMA would want the Manager of the GTMNER to have some discretion in his/her managerial style of the Reserve, we want assurances (in writing) that a Manager

cannot pick 'cafeteria style' with regard to which user groups he/she may want to see in the Reserve, or which groups he /she may want out. We hope that these safeguards for the taxpaying public, ESPECIALLY FOR THE LOCAL RESIDENTS, are clearly stated in the mgt plan and the FAC. I want to know, that if I, as a taxpayer, request a copy of the existing management plan of any public land, if, under recreational activities, it says "hiking, biking and horseback riding", then he/she (the manager) cannot keep us out. Please note in the current management plan, clearly stated under recreational activities 'RECREATION CONTRIBUTES TO THE SOCIAL WELL-BEING OF THE LOCAL RESIDENTS AND VISITORS AND ALSO TO THE LOCAL ECONOMY THROUGH TOURISM.' Please keep this statement in the mgt plan. Please remember that the public lands, geographically, are of the greatest benefit to the LOCAL RESIDENTS.

Last, but not least, please urge your new Manager of GTMNER Reserve to be USER-FRIENDLY.

Thank you very much for reading this long email, I hope I didn't ramble on too much.

Good luck in your endeavor!

Name: Michael M Bentzien, Ph.D

I have additional comments on the GTM Management Plan (Plan), following my written comments submitted at the November 2, 2006 scoping meeting at the Environmental Education Center. Specifically, some issues raised at that scoping meeting deserve additional consideration.

My understanding is that Mrs. Ellen O'Brien, apparently as a representative of the Ponte Vedra Riding Club, has previously asked DEP in Tallahassee for changes in equestrian access including weekend riding, dune access to the northern portion of the Guana beaches, and horse trailer parking on the road west of the Guana dam.

The weekend riding issue was apparently conditional on a pilot study to determine suitability of the increased use, but I am unaware of such a study being carried out. It appears that this change may have been de facto approved without review or public input.

While the voices of the equestrian community stressed the loss of the ability to ride in the Guana Reserve as their primary concern, that appeared to be a non-substantive issue that diverts attention from issues now at hand, namely, additional dune access and increased parking for horse trailers. Mr. Ballard stated at that meeting that there would be ". . .no bulldozers in the dunes at Guana. .".

That is not really the issue concerning beach access. Dunes can be damaged by human access in a number of ways short of heavy equipment use. One of the sites proposed for access is the old trail north of the north parking lot and crossover. This trail is in essential habitat for the endangered Anastasia beach mouse and vegetation is recovering because of the cable preventing easy human access. It should be left to recover. Development for equestrian access will result in loss of vegetation and potential erosion from blowout of sand. Equestrians currently have four access points to Guana with trailer parking: the north entrance to the Wildlife Management Area, Mickler's Landing, the Gate station, and the Guana dam. As equestrians can rapidly move and down the beaches, I see no need to develop another access point simply for convenience. Horse crossings of A1A would also seem to be a serious safety issue.

Mrs. O'Brien has also asked for additional parking on the grassy roadside west of the dam. This area has one of the densest gopher tortoise populations on the Reserve. It would be totally inappropriate to park trailers here, as they would crush burrows and tortoises (as would paving the area) . There is easy equestrian access from the parking lot at the dam. I see no justification for dedicated horse trailer parking in environmentally sensitive areas west of the dam.

The equestrian community has asserted that they wish to protect all the assets of Guana, and only want to maintain their ability to ride there. The latter two specific requests discussed above, however, show a disregard for the natural resources of the Reserve. Recreational activities on National Estuarine Reserves cannot be allowed to supersede the Reserves' primary purposes of research, environmental monitoring, education, and coastal stewardship.

Additionally, development and modification of the Plan should be carried out "in the sunshine", with public notice and input into significant changes. I am not comfortable with the way the above changes have been proposed and addressed, and suggest that consistent administrative procedures be followed in the future.

Thank you for the opportunity for additional comment.

Respectfully,

Name: Patti Peeples Gustafson

449 S. Mill View Way
Ponte Vedra Beach, Florida 32082
904.838.1782 Phone
904.212.2922 FAX
patti@hostage.org

Dear Management Staff

Thank you for the opportunity to provide public comment for the development of the Management plan for the GTM Reserve. I would first like to start with congratulations to all involved in the GTM NERR Environmental Education

Center. The Center has brought much needed focus to the rich environmental resources in the areas of North Florida , and the staff has worked incredibly hard at spreading the word on resource management, ecosystem science, education and outreach. They have done an extraordinary job.

As a frequent user of the Guana Wildlife Management area, I have a few suggestions for consideration as you draft your Management Plan:

* Public Use: the access routes to the Guana Wildlife Preserve on South Roscoe Extension and County Road 210 in Ponte Vedra Beach are not well-known nor are they well-marked. This particular tract of land has been the target of numerous development attempts (a new High School, 210 road widening, etc.). I believe that if these entrances were more well-known for public use, then a greater proportion of the public would be interested in pursuing its protection. There is no parking available at the 210 entrance and many do not know about the South Roscoe Extension parking area.

* Education & Outreach: Related to the above tract of land on South Roscoe Extension and County Road 210 in Ponte Vedra, the access routes could benefit from new signs on the wildlife that lives is and is protected within these environs, The existing sign on South Roscoe Extension is in disrepair, and there is no sign located at the 210 entrance. Additionally, the benefit of this area in terms of its contribution to the Guana Tolamata Reserve would be beneficial. Perhaps various educational signs and a large map showing the various trails can be placed throughout this Preserve area, including the occasional bench for users. This would encourage use by families who are less used to hiking and as a result, increase their awareness and appreciation.

* Ecosystem Science: Again, related to the constant quest to “take a piece of the Turpentine Farm that is Guana”, I think that there needs to be greater use of this tract of land around Ponte Vedra for scientific research (including publication of these findings) , and focused on the utility of this land in terms of its contribution to the entire North Florida ecosystem.

In summary, I am astounded at the low use of these lands for hiking, bird watching, etc. although — to Educational Coordinator Janet Zimmerman’s credit — the GTM NERR Environmental Center has vastly increased school children’s awareness level. The parents around Ponte Vedra are a large untapped market for raising awareness of the value of these beautiful lands and speaking to them in the terms of the things they seem to care most about (property values). Unfortunately, it is the adults who are not “nature lovers” who are the predominant population and who often are more than willing to support the “chipping off” of Guana. I suggest that education efforts be specifically targeted toward these groups of people. Raising awareness, encouraging use, presenting information in terms that they value (again, property values) will help preserve this property.

Thank you very much, and I consider the Guana the true jewel of our area.

Name: Mrs .Marilyn Whitford

10710 Clydesdale Drive West
Jacksonville, Florida 32257
904-268-3398

Dear Sir,

I have lived in Jacksonville for 52 years. I have seen much change and through all those years, including my childhood of riding on the beach, I have been an active and loyal citizen. I have raised three children here in Jacksonville and plan for them to be able to share my joy of horses and Jacksonville for years to come. Riding on the beach is a memory of enjoying a God-given resource and is always good for the soul. The freedom to ride on the beach is just one of many freedoms that we Americans hold dear...

Yours truly,

Name: Sherry B. Tornwall

MGF 1106 Coordinator
Math Department
Preview Advisor
University of Florida
P.O. Box 118105
Gainesville, FL 32611-8105
352-392-0281 x 233.
tornwall@math.ufl.edu

To Whom It May Concern,

As a Florida resident I have ridden horses and bikes at Guano River State Park. I sincerely hope that I will continue to be given the right to ride horses there and at the beach.

Name: Claire Kenyon

1533 Southshore Dr.
Orange Park, FL 32003

To whom it may concern:

My name is Claire Kenyon and I am a member of the SHADO riders. I am emailing my wish for continued beach access for horses. My address is 1533 Southshore Dr, Orange Park FL 32003.

Thank you

Name: Traci Rosenstein

I live in Ponte Vedra Beach, and it is a privilege to ride my horse on the beach. I ride with friends at Micklers Landing, and I speak for all of us all that we are respectful of the other beach lovers who enjoy that beautiful place as well.

Horse owners strive to protect nature and animals too, and we do everything to help preserve and respect the beaches and all nature trails. We also pick up our horse droppings.

Why don't we all work together whether it be on foot of horseback to preserve our beautiful Ponte Vedra Beach!!!

Name: Carolyn Shook

As a taxpayer of the State of Florida I support the continuation of horseback riding in the GTMNER Reserve (The Guana), especially the beach.

Sincerely,

Name: Dale and Nina Baer

Palm Valley, Florida

As taxpayers of the state of florida, We support the continuation of horseback riding in the GTMNER reserve, especially the beach.

thanks,

Name: Jeanie Mackey

1655 Marshside Drive
Jax Bch 32250
728-8777

This is in regards to the management plan for the GTMNER — Guana River.

I attended the scoping meeting on November 2. I thought the meeting was a great way to get input and thought it was very well run.

I wanted to give my input I views on allowing horses on the trails and on the beach.

I am in favor of horses being allowed access just as bikers and walkers are.

Certainly on the wooded trails I do not see where horses are in anyway detrimental to the habitat if they stay on designated trails and areas. As far as safety to other users on the trails, I believe that if horses are at a walk of trot — that this is much safer for other users of the trails than the bicycles I have encountered speeding around turns. I believe that most riders are content to walk or trot on the trails and this could be a courtesy rule for them.

I would like to suggest that horse trailers are allowed to park somewhere else besides the boat trailer parking areas, such as the trailhead area, only to appease the other users of the parking lot who may not want horses close to them:

As far as concerns about horses being on the beach, I think most of the people opposed to horses on the beach were against horse trailers taking up parking spaces. I don't think there are that many horse trailers in the parking lot at the same time for this to be a real concern.

There were also comments about it being too dangerous for the horses to cross A IA. It is no more dangerous that people crossing. Horse riders would not take their horses to an environment that the horse was not capable of being calm in — they don't want to endanger themselves or the horse.

Another comment about beach riding was the hazard to sea turtles. I have been a volunteer with the sea turtle patrol in Duval County and have seen deeper and larger ruts in the sand from trucks and other vehicles that are used in the sea turtle patrolling.

The horse hoof ruts are not that deep and not spaced closely together.

The riders would look out for nests. Horse people love animals of all kinds and would not do anything to harm them. I think horses could be an asset for patrolling for nest because horses go farther down the beach and could notify the turtle patrol group of nests.

Lastly, the issue about horse manure. Most people don't realize that horse manure is all vegetable matter, very biodegradable and breaks up and dissolves quickly. In the woods, birds such as crows clean it up very quickly and the ocean dissolves it quickly. Horse manure is so much cleaner than dogs or humans remains.

Please allow horses in GTMERR 7 days a week. We promise to be good stewards of the reserve.

Thank you —

Name: Phyllis Randall

248 Belmont Dr.
Jacksonville, FL 32259

Dear Sirs:

I am an avid user of Guana park, and hike, kayak and ride my horses there.

I would like to see horseback riding, hiking and biking kept in the management plan for the GTM.

I think that stewardship of our limited public lands should support and enable the tax payers to enjoy a variety of activities.

Thank you,

Name: Jackie Woloscheck

355 Ranch Rd
Ponte Vedra, FL 32081 (The new Ponte Vedra, courtesy of Nocatee!)

First, I want to thank you for having the meeting in regards to public input/Guana.

I spoke, but needed to let you know the following. I cannot hike or bike, but put me up on my horse and I can ride the trails at Guana. My horse is my legs, enabling me to enjoy the outdoors that I dearly love. Keep the trails and beach open to horse riding. "The countryside looks lovelier from the back of a horse".

"On the back of a horse we borrow freedom".

Thank you again,

Name: John Wooten

Dear Sir or Ma'am,

I'm writing to you as a Florida tax payer and avid equestrian on the issue of equestrian access to Guana State Park and Mickler's Landing beach access. First, I'd like to state that I ride one or both of these areas at least once every other month, the beach access more often in the summer, and I have never experienced any complaints about my horse's presence either on the park's trails or on the beach. On nearly every visit, children and their parents ask to come up and pet the horses and on many occasions have pictures taken with them. When entering the beach, I always stay near the dunes until I am well away from sunbathers, at which point I ride close to the water so that any manure I leave behind will be flushed out with the tide. I've even been out riding with friends where we ran across a wedding party and we obliged the bride and groom a picture with the groom riding on one of our mounts. I've had many similar experiences in Guana State Park, where everyone I meet is friendly and willing to share the trails with equestrians. I often dismount to pick up litter, especially near the beach closest to the parking area at Mickler's to set an example for others.

I've recently become aware that there may be some confusion on the reason for the meeting this evening. It's come to my attention that some equestrian groups are proposing a new trail to be cut through the dunes for beach access at a different point. While I only have limited information on this issue, I do not at this time support any new trails to be cut for beach access. I believe the dune area is already susceptible to erosion and beach access at this time is sufficient. I believe the continuation of the status quo at both Guana State Park and Mickler's Landing completely suits the needs of all users and keeps a good balance between the needs of the environment and recreational users of all kinds. I would also like to thank you, the management personnel of these two areas for your diligent work in maintaining both Guana and Mickler's. The trails are kept clear of downed trees and the beach is in my opinion the most beautiful in Florida. I've not visited any other beach anywhere that has as close to virgin beach as you can find today.

As I am on a business trip to Savannah, GA this week I cannot make the meeting this evening. I hope that this letter has made my position known that I support the continued use of the beach as well as Guana River State Park by equestrians, but do not now support any new trails to be cut through the dunes at the beach. The equestrian access to both areas is currently sufficient in my opinion. Thank you for your time.

Name: Cathy Dennison

8710 Longshore Way
Jacksonville, FL 32226
904-751-2110

As a taxpayer of the State of Florida I support the continuation of horseback riding in the GTMNER, especially on the beach.

When we went riding on the beach at Micklers Landing we received nothing but positive attention. Little kids faces lit up while watching us ride by. While walking our horses next to the boardwalk, people asked could they pet the horses. We obliged. The looks on their faces were priceless. A couple had just gotten married and were having their reception, they took the time to come out and pet the horses and even had a picture taken with the groom on one of our horses. Families walking on the beach watched us with a smile and complimented our horses.

We are careful to stay on the outer edge of the crowded area at the end of the boardwalk until we get clear of people then move down near the waters edge.

We are also extremely careful not to enter the areas where there may be turtle eggs. We take time to either remove or cover any "droppings" on the beach. I bet there are a lot of dog owners who don't do this. I cant say EVERY horse owner is this responsible but neither are the sunbathers/beach goer when it comes to littering. I can't say that I

haven't seen riders leave droppings but I can say that I have seen where people have littered and defecated. Horse poo is safe, people poo isn't.

We are very sensitive not to interfere with enjoyment of the sunbathers and beach-goers. If anything, I bet mot were excited to see the elegant beauty of a horse on the beach. And, I bet the kids had exciting stories to tell their family and friends when they got home.

Besides who the hell made the Sierra Club, King of the Universe?

Hors people and their horse's contribute quite a lot to Florida's economy and environment and it is getting harder and harder to find a place to ride.

PLEASE DO NOT TAKE AWAY OUR PRIVILEGE OF BEING ABLE TO RIDE ON THE BEACH!

Name: Clara Capps

President of Florida Trail Blazer
An equine club that is dedicated to the Creation and Preservation of Equestrian Trails

To Whom It May Concern:

As a taxpayer and fourth generation resident of the State of Florida I support the continuation of horseback riding in the GTMNER, especially on the beach.

Why should one club have the say on what many enjoy all year long. We as horseback riders are very conscious of the environment and love to be one with nature. In fact, in my years of riding the woods, forests, beaches, and shorelines of our beautiful state, find that horse people are always picking up and cleaning up other folks trash and leftovers.

Thank you .for your consideration,

Name: Karen Holmes

5458 SKylark Ct.
Jacksonville, Fl. 32257

To whom it may Concern,

I strongly request that our right to ride our horses on the beach is not reduced in any way. This is a wonderful activity that helps to build strong families. Please do not cancel it. Thanks.

Name: Peter Difatta (citizen of St. Johns County)

Tel: 904 685-2300
2381 S Ponte Vedra Blvd
Ponte Vedra Beach, FL 32082

I've submitted comments on a sheet at the recent scoping meeting at the GTM NERR education center. Here are some additional thoughts I hope will be considered concerning horses on the trail at the GTM NERR.

If horses are allowed to continue being on the trails, then the idea of allowing them to park on the West side of A1A and cross over is simply not workable. It would be too dangerous for traffic as well as the equestrians. Besides, the equestrians now have three safe areas to park and get access to the beach with horses and they are all East of A1A. (1. Mickler, 2. across from the Gate Station, and 3. Vilano beach access). I believe the ramp at the Reef restaurant may still be open too. This should be adequate.

If horses are allowed on the beach the following items should be considered. Are these large animals doing damage which could affect turtle nesting? If these animals are allowed, how can you justify banning automobiles, motorcycles, and ATVs? Some of these, since they weigh a lot less, probably have less of an environmental impact.

Animals have a mind of their own. How do you monitor a horse's psychological state? Some are very placid, others not. Horses have been known to bolt at the site of small moving animals such as mice, crabs and snakes (easily possible on the interior trails) . People could be killed because of this. How do you control the speed of the horse? Most equestrians control their horse at a slow pace, but I've seen horses on the beach at a moderate gallop. Small animals are required to be restrained with a leash. Large animals may not be able to be. Is this fair? This, of course, is all for protection of the public. How do you get the equestrians to pick up the droppings from the parking lot, the crossover and the beach?

Many parks have separate trails for equestrians and for ATVs because of these reasons.

Thank you for letting me express my thoughts.

Name: Al Howland

I enjoy your comments about the activity there. The environmental things are very interesting. I am way past it now but if I were a young person just starting out I would be tempted to pursue study and a career in environmental cares for the planet.

Sincerely

Name: Muriel and Arthur Fields

We want to thank you for a wonderful walk last saturday. Though the birds were scarce we learned much from our leaders. we now know how to determine if it is a male turtle or a female turtle. We have lived here for 12 years and this was the first time that we walked the trails. It is fantastic and we hope to return often. Thanks again.

Name: Henry C. Warner

Supervisor Group 3

St. Johns County Soil and Water Conservation District

Please accept of following comment for your consideration.

St. Johns County has a "model" fertilizer ordinance that encompasses the GTM Reserve area. This ordinance might have potential for application for impacting other parts of St. Johns County. It would be important to know what impact this ordinance has had upon the Reserve area.

Within your planning action what criteria might be used to determine how effective this ordinance has been and how it might be improved in implementation, compliance and impact. Both commercial and private parties would require co operating efforts.

Sincerely,

Name: Pam Johns

I would like to see horseback riding still be a part of the GTM management plan. Please don't exclude horseback riding.

Sincerely,

Name: Barbara O'Toole

2708 Arundel Lane

St. Augustine, FI 32092

904-230-8228

My name is Barbara O'Toole and I am a taxpayer in St. Johns county and I love riding my horse on the beach. It is one of the reasons we moved to this area is so I could ride my horse on the beach. (they did not have any beaches in Chicago where we moved from)

Thank You,

Name: Leslie Miedema

208 Belmont Drive

(904)230-1036

I have so enjoyed riding my horse on week days at the state park. We moved here 5 years ago and were so excited that this was such a horse friendly community. My family would like to see horse back riding , hiking and biking continued at the park. Please add my comments to the up coming meeting and vote.

Sincerely,

Name: Devona Bell Sherwood

213 Boating Club Road
St. Augustine, FL 32084

As a taxpayer of the State of Florida I support the continuation of horseback riding in the GTMNER Reserve. The trails are for multiple use, and horseback riding is one of the uses. The riders are incredibly respectful to others (I am a hiker in the park) and to the natural environment. It would be unjust to exclude them from the trails. The horses help to keep the trails in tact.

Thank you,

Name: Carol Thomerson

Ponte Vedra Beach

As a taxpayer in the State of Florida I support the continuation of horseback riding in the GTMNER Reserve (The Guana), especially the beach.

Name: Liz Ferguson

54038 Charles St.
Callahan, FL
(904)879-6673

I have recently heard of plans to close Guana River State Park, and Mickler's Landing to horse back riders. I don't understand. As a tax payer I believe we should have the right to utilize our beautiful natural resource, such as these two parks. I am not sure I will be able to attend the meeting on the 2nd of November, as this has just been brought to my attention. So I am e-mailing to voice my opinion on this matter.

I hope this has not fallen on deaf ears, and will be considered as a vote to keep Mickler's and Guana open to equestrians!

Thank you for your hopeful cooperation and consideration-

Sincerely

Response to Public Comments (November 1 and November 2, 2006).

The majority of the public comments received at these two meetings were from people for or against equestrian use of the Guana River Aquatic Preserve trails and beaches. Other comments focused on the need for expanded habitat monitoring and establishing baseline conditions, support for an expansion of the GTM Research Reserve's education program to focus on adults in the watershed affecting the Pellicer Creek Aquatic Preserve, and concerns for impacts by invasive species. These comments have been used to guide and prioritize the goals, objectives, and strategies outlined in the GTM Research Reserve Management Plan.

Public Use: Encouraging public use that is compatible with natural and cultural resource protection is a priority of the GTM Research Reserve. The natural and cultural resources of the GTM Research Reserve provide a unique user experience unavailable elsewhere. Consistent with public expectations and the GTM Research Reserve's mission, sustainability will be used as a guiding principle for decisions affecting natural and cultural resources.

The changing demographics of coastal Florida challenge the sustainability of the GTM Research Reserve's natural resources. The GTM Research Reserve plans to work cooperatively with all stakeholders to ensure information regarding the condition of the resources is known and that this information is used proactively to support compatible public use. **Public users of the GTM Research Reserve are considered key stakeholders and primary stewards of its resources.** Existing levels of use will be maintained unless research clearly identifies resource damage. More intensive or novel activities will be limited to those activities that have a carrying capacity established using scientifically valid methods and to those that can be demonstrated not to conflict with existing user experiences.

GTM Research Reserve staff recently concluded a pilot project for expanded equestrian opportunities. Based on the lack of evidence of bacteriological contamination, horseback riding on the beach will be allowed to continue. Horseback riding on the beach is allowed with the following conditions: horses are allowed only below mean high tide, within 3 hours of daily low tide. These restrictions are necessary for resource protection. The trail system will also remain open for equestrian user groups seven days per week. Additional restrictions may be necessary but only if scientifically-based monitoring results indicate natural resource damage.

Monitoring and Establishing Baseline Habitat Information: This Management Plan identifies an immediate need to evaluate existing ecosystem science information to establish baseline conditions in order to evaluate and prioritize future management activities. It also outlines the process by which species and habitat data is collected and analyzed using standardized methods that are well documented and allows for more rigorous methods of change detection.

Long-term standardized monitoring is necessary to assess trends in the condition of the GTM Research Reserve's water quality and biological resources. The initiation of the NERR System-wide Monitoring Program (SWMP) represents a significant accomplishment toward this goal however trends in important indicators (e.g., duration of hypoxia, salinity change, turbidity) requires additional data analyses and interpretation on an annual cycle. In order to fully characterize the GTM Research Reserve's natural resources and fulfill its mission expanded monitoring and modeling capabilities. These activities will be linked to biological indicators of habitat condition. The GTM Research Reserve research staff will strive to use and expand existing datasets for analyzing trends and to guide future monitoring locations and protocols.

Adult Education Opportunities to focus on Watershed Scale Issues: This Management Plan integrates education strategies with resource management and ecosystem science to ensure up-to-date information is incorporated into the GTM Research Reserve's Education Program. The primary goal of this approach is to reduce the impact of watershed landuse on coastal resources by identifying priority pollutants and encouraging best management practices.

Increasing coastal populations will require novel approaches to managing watershed landscapes and finding solutions for reducing pollutant loadings necessary to sustain or improve coastal water quality. The GTM Research Reserve plans to actively encourage, coordinate or facilitate projects that reduce watershed-scale pesticide and fertilizer use, conserve water, encourage renewable energy technologies, promote native landscaping, and preserve land buffering wetlands, watershed flow-ways and shorelines. The GTM Research Reserve will also strive to serve as a demonstration site and a clearinghouse for innovative science-based technologies and methods that support these objectives.

Invasive Species: All invasive exotic species are a threat to the integrity of the GTM Research Reserve's natural communities and are in direct conflict with its mission to encourage sustainable conservation of natural biodiversity. The degree of threat posed by these species differs within managed areas comprising the GTM Research Reserve. Therefore, the policy of the GTM Research Reserve and its partners is to remove exotic species incompatible with each location's management goals.

The GTM Research Reserve's location makes it particularly vulnerable to invasion by species established in south Florida. Several invasive exotic species, such as Brazilian pepper (*Schinus terebinthifolius*) and Australian pine (*Casuarina sp.*), are already found in surrounding landscapes but not yet established in the GTM Research Reserve. Prevention is the best strategy to protect the GTM Research Reserve's natural resources from damage by new invasive exotic species. Many of these species will be introduced to the GTM Research Reserve by well intentioned individuals, as escaped pets, or will be carried on boats or in ballast water. The threats caused by exotic species and prevention strategies must be continually included in educational materials to emphasize the severity of this issue and to promote voluntary action. In addition, stewardship and research strategies are needed to quickly identify new invasions and assess the impact to native flora and fauna. Climate change and its impact on range extension of exotic species from south Florida is an increasing topic of concern for the GTM Research Reserve.

A majority of the past focus of the GTM Research Reserve has been on terrestrial exotic species; however, estuarine, oceanic and freshwater invasive species are equally damaging. GTM Research Reserve's education, research, and stewardship program will take an integrated approach to effectively control and, if possible, to eradicate Exotic Pest Plant Control Council (EPPC) category I and category II invasive exotic species within CAMA managed lands.

These Integrated Strategies will include: Monitoring changes in natural biodiversity in sensitive habitats and proactively responding to new exotic species invasions, controlling existing invasive species consistent with state and federal protocol to minimize non-target damage, interpreting the GTM Research Reserve's invasive species control program through displays, fact-sheets, posters, K-12 programming, and public outreach activities. The effectiveness of these strategies will be evaluated by determining the area or number of non-native species removed, by documenting a decreasing trend of ecological impact from non-native species as measured by loss of sentinel native species, and by examining the condition of the GTM Research Reserve's CAMA managed habitats versus adjacent unmanaged landscapes.

Recent invasions by Asian green mussels (*Perna viridis*) and titan acorn barnacles (*Megabalanus coccopoma*) have been documented in the GTM Research Reserve. A comprehensive management strategy to quickly detect estuarine invasive species is needed. Details of the GTM Research Reserve invasive and nuisance species management issues and strategies can be found in Appendix A 7.

D.3.3 / Second Management Advisory Group Meeting

Management Advisory Group, January 24, 2007, Marineland
Guana Tolomato Matanzas National Estuarine Research Reserve
Department of Environmental Protection
Management Advisory Group

Meeting Summary / January 24, 2007

Members Present	Members Absent
Jim Darby, Flagler County Commission	Barry Benjamin, St. Augustine Port Authority
Justin Ellenberger, Guana River Wildlife Mgmt. Area	Mark Crosley, Florida Inland Navigation District
Pierre Pierce, Friends of the GTMNERR	Gordie Wilson, National Park Service
Doug Carter, Recreation and Parks	Kelly Smith, Citizen Appointee
Michael Cullum, St. Johns River Water Mgmt. District	Mark Arnold, Citizen Appointee
Ben Rich, St. Johns County Commission	David Miles, City of St. Augustine
Karen Taylor, Citizen Appointee	
Richard Rubino, Citizen Appointee	
Anne, Citizen Appointee	
Barbara, Citizen Appointee	
Jim Netherton, Town of Marineland	
Frank Usina, Citizen Appointee	
Susan Van Hoek, Citizen Appointee	
Mike Kuypers, Dept. of Agricultural & Consumer Services	
Christopher Benjamin, Citizen Appointee	

Others Present	
Brian Paradise	Karen Bareford
Jack Pittman	Stephanie Bailenson

GTMNERR Staff	
Dr. Mike Shirley	Forrest Penny
Janet Zimmerman	Suzanne Dixon

Item 1: Call to Order and Pledge of Allegiance.

The meeting of the Guana Tolomato Matanzas National Estuarine Research Reserve Management Advisory Group (GTMNERR MAG) was called to order at 6:00 p.m. by Chairman Jim Darby. Audience and Board stood for Pledge of Allegiance.

Item 2: Determination of a quorum (7 or more MAG Members).

GTM Secretary Suzanne Dixon took the roll, and then determined there was a quorum as more than the minimum number of 7 MAG members was present.

Item 3: Introductions.

Introduction of MAG members was dismissed in lieu of the nameplates.

Introductions of the staff were conducted. Members of the public were introduced and welcomed.

Item 4: Introduction of Dr. Michael Shirley, Environmental Administrator for GTMNERR.

Dr. Shirley gave a brief history of his experience, education and research. His philosophy is to be a lifelong student. Chairman Darby gave a brief history of the formation of the GTMNERR and the early public meetings, with praise for the MAG members, many of whom are original appointments.

Item 5: Approval of Meeting Summary from September 13, 2006.

The motion to approve the meeting summary from 9/13/06 was made by Karen Taylor and seconded by Mike McCullum. It was voted on and approved.

Item 6: Report on MAG Appointments.

Dr. Mike Shirley reported that the MAG is in need of two citizen appointments from Flagler County, and one from St. Johns County. The MAG is also in need of an agency representing the USDA or from the Soil and Water Conservation District. Staff was directed to solicit suggestions for appointments. Discussion ensued regarding the agency representative. Chris Benjamin offered to assist in this contact.

Item 7: Announcements by Chairman Jim Darby

No announcements at this time.

Item 8: Reports by MAG agency partners: current projects, issues, needs.

Pierre Pierce, Friends of the GTMNERR – The Friends committee has been approached for Eagle Scout projects. One is to build an informational kiosk @ the GTM trailhead, another is to do a habitat restoration and a handicapped guardrail @ the North parking lot, and the 3rd was regarding a whale program.

Matanzas State Forrest – draft management plan in Tallahassee for review. Citizen review committee will be put together

Timber fitting going on for hunting season, pending projects such as camping and parking area for equestrians.

Doug Carter – Dept of State has approved the application of Washington Oaks Garden State Park to be placed on the national register of historic places.

Justin Ellenberger, Fish and Wildlife Commission, Guana River Wildlife Management Area (GRWMA) – Maintenance on fire breaks and channels in Ponte Vedra Lake being done in anticipation of prescribed burn maintenance. Lowest duck harvest found but highest deer harvest. Installation of recreational improvements, signage, interpretative kiosks, participating in First Coast Nature Festival, and participated in radio sports show at the EEC.

Mike Cullum, SJRWMD – Finishing watershed models from northern portion of GTM and working on southern portion. A hydrodynamic model being completed on grid which revealed a net of different cells, flows and water quality through the estuarine system. Completed GIS coverage on vegetation in the estuarine grid and copies are available. Study showed very healthy seagrasses, mangroves and a lot of good vegetation within the system. There was other discussion of the vegetation with regard to shellfish beds and harvesting and research of fecal coliform within the NERR boundaries. There was a consensus that GTM would take this on as a topic and report back to MAG as appropriate.

Item 9: Reports by MAG citizen members on issues, events, or ideas on GTMNERR implementation.

Two members, Anne Wilson and Karen Taylor reported that this meeting would be their last meeting, as they were not seeking reappointment to clear the way for new members to serve in the future. The MAG thanked them for their service.

Chris Benjamin mentioned a special thanks to the NERR staff, Forrest Penny and Janet Zimmerman for participation in beach clean up 5000 pounds of material off of NERR property. Mr. Benjamin also commended GTMNERR as an outstanding venue for meetings. The staff and facility is outstanding.

Mr. Darby also thanked Janet Zimmerman and GTMNERR staff for participation in the Scenic A1A dedication event by providing information on natural habitat along A1A and the touch tank with some species found in the estuaries along the scenic A1A corridor.

Item 10: Update on GTMNERR Management Plan

Mike Shirley – The structure for the GTMNERR Management Plan will be an issue based outline. We will be linking NERR activities with issues and challenges in our area. Currently GTMNERR staff is participating in brainstorming sessions to identify topic areas and explore issues within boundary such as public use, habitat, coastal resources, and outside boundary issues such as things happening in our watershed. Other issues included may be global issues such as sea level rise and atmospheric issues. A preliminary draft should be ready in April.

Item 11: GTMNERR Activities.

Janet Zimmerman, Education Coordinator – At the last MAG meeting, you drafted a letter of appreciation for Ken Berk. Staff prepared the letter, had it framed and presented it to Ken. Ken asked that I express on his behalf his great appreciation for that and he enjoyed working with all of you immensely. The education staff has completed their fall session of school trips and will be preparing for the spring session of school trips. We are currently working on 4th, 7th, and high school programs with some additional days filled by 2nd 3rd and 5th graders. We have quadrupled the number of groups taken from last year by using our volunteers. The volunteers have been trained and assist staff tremendously in these programs. Adult education programs will be offered in the Southern section (Marineland facility). Adult Day Camp in March 2007 in cooperation with Maia McGuire of Florida Sea Grant.

Marty Healey, Environmental Trainer- Coastal Training Programs (CTP) – Met with citizens to discuss coastal erosion home and beach nourishment. Reserve offered to gather experts for exploring possible solutions. Summerhaven residents are concerned with silting in off Summerhaven river – decline in oysters from washover and inlet. Florida Inland Navigation District is having a meeting to study Matanzas Inlet hydrology and biology. Green lodging workshop was held with 20 attendees. Future workshops will be Clean Marina through DEP programs. Dock workshop – for dock construction industry. City of St. Augustine asked Reserve to pull together information. Many different activities upcoming in partnership with Whitney Marine Lab, St. Johns County environmental educators group. Other upcoming events were mentioned for the Spring Summer at the education center.

Forrest Penny – Stewardship- No prescribed fires being done due to drought. There was a burn done in November/ December on the FWC marsh on the peninsula. It is now greening up and revegetating. Fence projects are being sent out to bid for fencing around Indian burial grounds.

Item 12: Public Comment on items not on the Agenda (3 minute time limit each speaker)

No comments at this time.

Item 13. Adjournment

The next MAG meeting will be Wednesday May 16, 2007 at 6PM at the Ponte Vedra location. Motion to adjourn made by Ben Rich and seconded by Karen Taylor. No objections. Meeting was adjourned @ 7:20 PM

Minutes Approved May 16, 2007

D.3.4 / Second Set of General Public Meetings

General Public, September 26, 2007, Marineland

General Public, September 27, 2007, Ponte Vedra Beach

Attendance

Name	Agency, Organization or Company	Meeting attended
Jack Pitman	Self	26-Sep-07
Gorde Wilson	National Park Service	26-Sep-07
Scott McCorkle		27-Sep-07
Ellen O'Brien	Ponte Vedra Riding Club	27-Sep-07
Kathy Shirley	Self	27-Sep-07

Public Comments

Recommend that an attempt be made to communicate with Marineland (the attraction) as to the GTMNERR activities that are in progress all around the facility in the community of Marineland. There may be Opportunities for relationship that is not immediately evident. *Comment provided by Jack Pitman*

The subject is a tidal chart, which is prepared for public information and activities (fishing). Many charts merely give you the times of the tide, low and high tides. These charts should also state where the readings are taken but more important, they should state the average heights of low and high tides. This will make the subject more "visible" to the public. *Comment provided by Anonymous*

Written comments submitted during comment period

These are written comments received within the comment period, which ended on October 4th, 2007

Andrew S. Kaufman
2537 South Ponte Vedra Blvd.
Ponte Vedra Beach, FL 32082
(904) 825-1723
September 27th, 2007

To: Management Staff, Guana Tolomato Matanzas National Estuarine Research Reserve

Re: Management Plan

Please accept this letter as if I had presented this request in person at your public scoping meeting today.

The management plan should include a set of requirements and restrictions on the St.

Augustine airport. Currently the airport's flight traffic interrupts the migration path of birds as well as wildlife that use the NERR as a nesting and feeding ground. Whenever aircraft cross the NERR there is a risk that toxic fluids will leak from the aircraft falling into the water. There also is a risk of a spill of petroleum products at the airport running into the estuary. Even a small amount of oil dripping onto the runway and then running into the water will disturb the aquatic life. The noise from the aircraft disturbs all the birds and animals, as well as human visitors to the education center and recreation areas.

You need to make as part of your plan:

- No aircraft will fly over the NERR.
- The airport must submit a toxic spill disaster plan that includes the steps they have taken to mitigate any type of spill before it affects the NERR.
- The airport must submit their hurricane disaster plan which includes the steps they have taken to keep any dangerous chemicals from spilling and entering the NERR. This plan must also include Tornadoes.

The second issue that I feel is important is the problem of garbage collection on A1A. Currently the garbage is picked up on Thursday. A few years ago this was changed from the longstanding tradition of pickup on Monday. The collection day should be changed back to Monday because this area is filled with weekend renters as well as owners who only come on the weekend. When they leave on Sunday they place their garbage out on the road for pick up. Because the garbage sits on the curb for 4 days it attracts animals, who normally would not leave the Guana. Many of these animals get hit by cars, others just dig through and dump the trash all over the road. The spilled trash then blows into the reserve or onto the beach and in the case of plastic bags (and other refuse) they become hazardous to animals in the reserve and affect water quality. You need to add to your plan contacting the St. Johns County Commission and requesting that they require their garbage collection contractor (Seaboard Waste Systems) to change the collection day for A1A back to Monday as soon as possible.

I am sorry that I could not attend, but I appreciate your attention to these matters of great concern to me and many other residents of this area.

Sincerely,
Andrew Kaufman

PONTE VEDRA RIDING CLUB LANDS END
PONTE VEDRA BEACH, FL 32082
TEL: (904) 710-1215
FAX: (904) 273-6845
Dr. Mike Shirley
Manager
Guana Tolomato Matanzas National
Estuarine Research Reserve
505 Guana River Road
Ponte Vedra Beach, Florida 32082

Dear Dr. Shirley:

This letter's purpose is to make an official comment on the GTMNER Reserve's DRAFT Management Plan, July 2007.

We members of the PVRC are very happy to realize that you and your staff, including CAMA and DEP in Tallahassee, will continue the historic tradition of horseback riding in the GTM Reserve, including horseback riding on the 4.2 mile stretch of Guana Beach.

We are also very glad to see that hiking and biking on all of the multi-use trails will continue. Equestrians look forward to sharing the trail system with these other groups.

We have notice the recent upgrades for a more user-friendly environment at the Reserve, such as picnic tables, benches, water access to hose off horses, kayaks, bicycles, etc., and we commend you for your positive attitude and outreach to the public who frequent the GTM Reserve. I noticed very recently the placement of benches at the water's edge at the Dam Site for fishermen. What a wonderful amenity this is!

We equestrians look forward to working with you and your staff in the coming years to keep the Guana the beautiful, pristine place it is now and for future generations to come.

Sincerely yours,
Ellen O'Brien

Cc: Ms. Karen Bareford, CAMA

Response to Public Comments (September 26 and September 27, 2007).

The science-based approach of the draft plan appears to have alleviated the controversy regarding public access. The focus of the GTM Research reserve on sustainability has generated widespread acceptance as demonstrated by the absence of controversial comments.

The establishment of baseline conditions including pollutant concentrations should address Mr. Kaufman's concern regarding potential release of hazardous chemicals from the airport. Bird monitoring (especially of nesting and roosting activity) will be useful to ascertain the impact of airplanes on the GTM Research reserve's natural Resources.

The equestrian users, including Ms. O'Brien, are considered important stewards and advocates for sustaining the GTM Research Reserve's natural resources.



**Guana Tolomato Matanzas
National Estuarine Research Reserve**
Management Plan • May 2009-April 2014

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National Estuarine Research Reserve**
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