

## **State of the Reserve 2011**

### **“Managing Partners”**

#### **Summary**

The studies in this document represent but a few of the many research, monitoring, education and conservation activities that have taken place over the past year at the GTM NERR. Some programs are of a short duration while most are long-term and lend themselves to future research and monitoring needs and practices, and all contribute to the growing body of scientific knowledge.

Also see posters describing other programs not covered in this document.

**For Additional Reading, the Site Profile** of the Guana Tolomato Matanzas National Estuarine Research Reserve, published August, 2009, Frazel, Inc., provides an environmental overview of the GTM NERR estuaries and terrestrial ecosystems represented within the Reserve, outlines ongoing research and monitoring, and identifies site-specific needs and practices. The Site Profile also includes a description of biotic habitats, an overview of the Reserve programs and partnerships, a summary of research conducted within the Reserve, and suggestions for future research and monitoring.

**The GTM NERR Management Plan** can be found online via a web search under GTMNERR.

## **“Florida Fish and Wildlife Conservation Commission’s Right Whale Conservation Program”**

**Presenter:** Tom Pitchford

With NOAA’s funding, the Florida Fish and Wildlife Conservation Commission (FWC) participates in an Early Warning System aerial survey effort designed to locate right whales and report their locations in near real-time to the maritime community so ship strikes can be avoided. Examples of other data obtained from these surveys include right whale distribution, abundance, and calf recruitment.

NOAA funds also support the state’s right whale biopsy effort (calf survivorship), whale stranding response (determining mortality factors), and disentanglement efforts. A 25-foot Zodiac boat used for biopsy and disentanglement efforts is supported by NOAA as well.

Other teams relating to the FWC efforts to collect data and address the plight of right whales are the Right Whale Recovery Plan’s Southeast Implementation Team (which meets twice yearly at GTM NERR, before and after renovations), NOAA’s Atlantic Large Whale Take Reduction Team, and the Atlantic Large Whale Disentanglement Team.

### **Biography**

Tom Pitchford is an Associate Research Scientist and Field Lead for Fish and Wildlife Conservation Commission’s (FWC) Right Whale Project. He is a wildlife biologist with the state’s FWC and directs the field effort based in St. Augustine. He is a graduate of Virginia Tech and has been employed by FWC since 1993. Tom is also Co-chair of the Right Whale Recovery Plan’s Southeast Implementation Team.

## **“GTM NERR Volunteer Program: A Dynamic Bunch”**

**Presenter:** Carly Swatek

In a variety of specialized focuses, volunteers at the GTM NERR continue to prove their well-rounded capabilities with skills spanning every sector of the Reserve’s mission. Volunteer positions complement the priority projects in the GTM NERR Management Plan. These include education, research, and stewardship categories as well as other areas such as visitor services, facilities, and various training opportunities. Wherever a talent presents itself, there is a volunteer task to which it is suited. Since its inception in 2005, the GTM NERR volunteer program has provided over 60,000 hours of service to the Reserve, and the Reserve could not do without them.

A diverse array of individuals enter the Reserve each year, and with each interaction the overall goal of achieving conservation of natural biodiversity and cultural resources is furthered through the science-based stewardship and education programs incorporated into daily activities. The people who make use of the Reserve have benefited from the work of the volunteer conservation program. Many students have learned about the marine environment, thanks to the education committee comprised of a variety of volunteers. The opportunity to work with biological monitoring programs appeals to volunteers of all ages who cover such species as the endangered marine turtles, butterfly and bee populations, and microorganisms on the lowest end of the food chain, such as phytoplankton.

### **Biography**

Carly Swatek became a member of the GTM NERR staff in September of 2011 as Volunteer Coordinator. She has a degree in Environmental Studies and Communications from the University of Wisconsin- Madison. From 2010 until joining the GTM Research Reserve, she

served as an Environmental Educator working with a variety of students on topics ranging from Florida Ecosystem Science to watersheds for the Florida Park Service AmeriCorps Program.

### **“UNF Transformational Learning: Using the GTM NERR as a Classroom”**

***Presenter:*** Kelly Smith

The University of North Florida (UNF) has an ongoing program to provide Transformational Learning Opportunities (TLO) that enhance undergraduate educational experiences. During spring of 2011, the Presenter led a course titled: “Identification and Management of Coastal Resources” at the GTM Research Reserve Environmental Education Center. A group of 10 students studied at the Education Center each week, where they interacted with staff, learned about estuarine habitats, and developed group research projects that were carried out during the one-semester course. Each week students met with different staff members and learned about conservation management within the Reserve. Students worked in nearby habitats of the Reserve, and were also able to use classroom facilities to coordinate efforts and work up field collected samples. Four research groups carried out projects with the potential to contribute to monitoring efforts at the GTM NERR. At the end of the course, each of the groups produced a research poster, which they presented to Reserve staff at a mini-workshop. These posters are available for viewing at the State of the Reserve meeting in December, where aspects of the course, some of the student learning outcomes, and the value of the GTM NERR facility to student learning about coastal systems were discussed.

### **Biography**

Kelly Smith has been with the Department of Biology at UNF since 1999. Her research focuses on fish biology and estuarine ecology. In the last five years she has focused on effects of low dissolved oxygen on juvenile fish ecology and behavior, working with fishes abundant within the waters of the GTM NERR. At UNF she teaches a number of upper-level courses, including Marine Ecology, Limnology, and Ichthyology as well as teaching some special topic courses, such as the GTM NERR TLO. The specialty courses use the diverse coastal habitats near UNF (such as the GTM NERR) as living laboratories, where students learn about sampling methods, organism diversity, and impacts of human activities on ecological systems.

### **“Invasive-wise Watershed; the GTM Invasive Plant Task Force”**

**Presenter:** Emily Montgomery

The mission of the GTM Invasive Plant Task Force is to increase public awareness of invasive plants within the watersheds of the GTM NERR as well as to map, monitor, control, and prevent the establishment of invasive plants on GTM NERR publicly managed lands, and to facilitate open communication between departments on such work. Invasive species are increasingly becoming a priority concern due to their potential ecological and economic impacts. According to the Nature Conservancy, Florida’s ecosystem deterioration due to invasive plants is greater than all other states with the exception of Hawaii. Some important contributing factors to this are Florida’s hospitable climate, being the point of entry for almost three-quarters of the plants that enter the US, and the large plant and nursery industry in the state.

The GTM Invasive Plant Task Force works within the frameworks of Florida’s larger invasive species networks: The Florida Invasive Species Partnership, our local Cooperative Invasive

Species Management Area, and the First Coast Invasive Working Group (FCIWG). One of the most critical goals of the GTM Invasive Plant Task Force is to work across boundaries and within the local communities to increase awareness and implement control on some of the worst and most threatening invaders. Since 2009, we have had great successes in partnering with our local agencies and private landowners to remove invasive plants from many different landscapes throughout the watershed.

### **Biography**

Emily Montgomery studied Anthropology at the University of Florida where her focus was on how indigenous people related to their environments and the effects of their exposure to industrialized nations. She began her environmental career in 2007 as an intern with the Nature Conservancy to help structure and implement a local survey of invasive plants on publicly managed lands for the FCIWG. In April 2008, she joined the GTM NERR and is currently the Coastal Training Program Coordinator.

### **“Spatial Ecology of Gopher Tortoises in GTM NERR Sand Dunes”**

**Presenter:** Anthony Lau

The gopher tortoise (*Gopherus polyphemus*) has been suggested to be a keystone species in southeastern upland sandhill ecosystems, and its habitat requirements have been well documented. Relatively few studies have been conducted on populations that occur in coastal sand dunes. Due to their close proximity to the ocean and highly fragmented habitat, coastal populations of gopher tortoises are affected by unique factors that are not observed in upland populations. In this study, burrow site selection of gopher tortoises in a coastal sand dune site was quantitatively modeled, and significant biological, environmental, and anthropogenic factors that may influence burrow site selection were identified. Land cover type, distance to edge, soil resistance, percentage of herbaceous

cover, slope angle, and number of tortoise burrows have significant influences on burrow site selection probability.

Radiotelemetry techniques were used to characterize habitat use, movement and seasonal activity patterns, and areal requirements of adult gopher tortoises. Twenty tortoises were fitted with radio-transmitters and tracked for up to 12 months. Home range size, distances moved, number of burrows used, and duration of winter inactivity were determined and used to compare with previous studies conducted in upland habitats. Dispersal away from sand dune habitats was not observed, probably because of the proximity of a heavily used highway paralleling the coast. Conservation needs and management implications for sand dune gopher tortoises are being discussed. Coastal sand dunes may serve as short-term alternative recipient sites for gopher tortoises that are affected by encroaching development.

### **Biography**

Anthony Yin Kun Lau, Department of Wildlife Ecology and Conservation, University of Florida, grew up in Hong Kong, China, and moved to the United States in 2005 to pursue a university education. He graduated with an AA in zoology from Santa Fe College in 2007 and a BS in wildlife ecology and conservation with honors from the University of Florida in 2009. Anthony's research interests include landscape and molecular ecology of reptiles and amphibians, conservation of threatened and endangered Asian chelonians, and evolutionary biology of the order Testudines. He conducted research in spatial ecology of gopher tortoises within the GTM NERR from 2010-2011. In 2011, he received an MS degree in wildlife ecology and conservation from the University of Florida under the mentorship of Drs. C. Kenneth Dodd Jr. and Raymond Carthy.

### **“Education, like the Environment, Depends on the Individual”**

**Presenter:** Kenneth Rainer

The GTM Research Reserve Education Program's primary goal, while meeting management plan objectives, is to provide a one-of-a-kind opportunity for the public to learn about the many functions of the coastal and estuarine ecosystem and natural history of Northeast Florida. Formed to maximize limited resources to their utmost potential, the primary goal is supported by attaining and nurturing educational collaborations that are mutually beneficial

and will incorporate commonly used technological resources. Presently, the education team conducts multiple programs throughout the year that span all age groups. The formal education programs are aligned to Florida's Sunshine State Science Standards and national educational standards. The Education Program is continuously accommodating the ever-changing educational needs of the surrounding area. The highly experienced staff is excited and eager to explore ideas, concepts, and resources that will update and build educational programs modeled on relevant and applicable research. For example, the program identifies the best methodology for a more holistic educational approach and links it across different discipline standards, in addition to science. Principles of the Lynn Stoddard and Anthony Dallman-Jones model of Educating for Human Greatness are being applied to the programs, including valuing the "seven dimensions of human greatness" (e.g., Identity, Inquiry, Interaction, Initiative, Imagination, Intuition, and Integrity). The Education Department also plans to research and utilize educational resources and techniques that marry "economy" and "environment" through the concepts of ecosystem services and natural capital.

### **Biography**

Kenneth Rainer, Education Coordinator at the GTM NERR, has a research science background uniquely integrated into the educational field. He earned his BS degree in Biology with marine emphasis from Texas A&M University at Galveston and recently completed his MS degree in Biology from Texas A&M University – Corpus Christi. While conducting research focused on marine population genetics, he began volunteering for an outdoor environmental education outreach event geared towards underserved/under-represented students. This led him to combine his dual passions for education and science. He later worked for the Harte Research Institute for Gulf of Mexico Studies as their first fully dedicated Education Specialist. His education principles stem from the Lynn Stoddard and Anthony Dallmann-Jones model of Educating for Human Greatness.



## **“The Use of Estuarine Resources by the American alligator at the GTM NERR”**

**Presenter:** James C. Nifong

The American alligator (*Alligator mississippiensis*) is the most abundant large-bodied vertebrate predator in aquatic ecosystems of the southeastern United States. Although alligators are known to inhabit a variety of freshwater habitats including lakes, rivers, wetlands, and swamps, their use and corresponding interactions in estuarine and marine habitats are poorly understood. As part of a broad-scale assessment of alligator ecological interactions in these habitats, a study of alligators inhabiting the GTM NERR was initiated in 2010.

A variety of techniques were employed to assess the degree to which alligators use estuarine habitat and food resources. These included GPS telemetry, stable isotope and stomach content analyses, and the use of critter-cam video collection devices. The presentation includes preliminary data and results from two field seasons.

### **Biography**

James Nifong is currently pursuing a PhD from the University of Florida Biology Department under Dr. Brian Silliman. His research is based on the integration of community ecology, herpetology, natural history, and the use of modern analytical techniques to inform management decisions in coastal habitats of the southeastern US. In 2007, he received a BS degree from the University of Florida, Department of Zoology, graduating summa cum laude. In 2008, he began his graduate studies and in 2010 he was awarded a Graduate Research Fellowship from the GTM NERR.

**“Coastal and Estuarine Research at GTMNERR: Current and Future Long-Term Research Efforts within the Reserve. ”**

**Presenter:** Matthew E. Kimball

As one of the 28 Reserves in the National Estuarine Research Reserve system, GTM NERR is charged with implementing national long-term research programs, investigating relevant regional and local research questions, and facilitating related research efforts by visiting scientists and students conducting research in the myriad estuarine and coastal habitats within the Reserve. GTM NERR scientists are currently conducting long-term research on the physical environment (water quality, nutrients, meteorologic), estuarine biological communities (marsh birds, sea turtles, invasive crabs, mosquitoes), and coastal upland biological communities (gopher tortoises, beach mouse). In addition, in 2011 the Research Program expanded ongoing projects or initiated new long-term programs, all in line with national, regional, and local interests. These included projects focusing on estuarine invertebrates, fishes, and salt marsh vegetation as well as focusing on terrestrial biological communities such as native bees and gopher tortoise commensal species. Combined, these various research projects provide a better understanding of the terrestrial and aquatic flora and fauna in coastal and estuarine ecosystems. Similarly, such research efforts produce comprehensive (and much needed) baseline data allowing researchers and managers alike to better detect and respond to environmental challenges.

**Biography**

Matt Kimball is the Research Coordinator at the GTM NERR where he coordinates scientific research conducted within the Reserve by staff scientists, visiting investigators, and graduate students. In addition, Matt simultaneously serves as an Assistant Research Professor in the Department of Biology at the University of North Florida. His research interests are primarily in the biology and ecology of juvenile and adult fishes and crabs. His research efforts to date have taken him to various estuarine and coastal habitats along the US Atlantic and Gulf coasts. He earned his BS in Biology from University of North Carolina Chapel Hill, his MS in Zoology from North Carolina State University, and his PhD in Ecology & Evolution from Rutgers University.

