



INWATER RESEARCH GROUP, INC



Annual Report

2010

Our Mission Statement:

“Our mission is to provide the scientific community and general public with information to promote conservation of coastal and marine species and their habitats.”



Message from the President

2010 was a momentous year for sea turtles and other wildlife in the southeastern United States, and also for Inwater Research Group. The year began with a prolonged period of record breaking cold weather that in addition to impacting fish and manatee populations across Florida, triggered a massive stranding event of cold-stunned sea turtles from the Florida Panhandle to the Keys. Over 5000 sea turtles were rescued from Florida waters during the month of January, overwhelming the resources of the stranding and salvage network and rehabilitation facilities. Along with other wildlife organizations, agencies and volunteers throughout the state, IRG staff responded to this unprecedented event by donating their time expertise, and resources. Our shallow-draft skiff was used to recover cold stunned turtles from the Mosquito Lagoon and Indian River Lagoon in east central Florida, and our facilities at the Florida Power and Light Company St. Lucie Power Plant were used as makeshift turtle warming and holding facilities. IRG staff spent many hours tagging, transporting and preparing the turtles for release. Thousands of sea turtles were saved by the heroic efforts of hundreds of dedicated people throughout the state, and IRG is proud to have played a part.

In April of 2010, as the whole world knows, there was a catastrophic oil spill in the Gulf of Mexico. What is less well known is the impact this spill had on the early juvenile stages of four species of sea turtles which use the pelagic zone of the Gulf as a developmental habitat. Young Kemp's ridley, loggerhead, hawksbill, and green sea turtles spend the first few years of life associated with drifting patches of sargassum algae, which provide both food and shelter. The same oceanographic forces of current and wind that concentrate this drift algae into long "weedlines" also concentrated the oil from the Deepwater Horizon spill in the same areas. Very little research has been done in these habitats, which are 40 or more miles offshore and often in thousands of feet of water. Recognizing IRG's expertise in the open water capture of sea turtles, the federal and state wildlife agencies involved asked IRG to assist in the rescue of oiled turtles and the assessment of the magnitude of the impact of the spill on these pelagic phase turtles. IRG, under contract to the Unified Command, put together teams of biologists operating out of Venice Louisiana, Orange Beach Alabama, and Destin Florida. Our teams assisted in the capture of over 500 turtles. Each turtle was evaluated for degree of oiling and either transported to a rehabilitation facility or tagged and released as appropriate. The true magnitude of the effects of this spill will not be known for years. There is a program underway, known as a Natural Resource Damage Assessment (NRDA), which will attempt to quantify the damage from the spill and identify appropriate mitigation and restoration. IRG will be

conducting the offshore sea turtle component of the NRDA damage assessment with funding from the National Oceanic and Atmospheric Administration. We expect to be working on this very important project through 2011.

In 2010, IRG continued our contract with the Florida Power and Light Company to manage the sea turtle conservation program at the St. Lucie Nuclear Power Plant on Hutchinson Island in St. Lucie County, Florida. This is a hands-on program that safely captures and frees sea turtles from the cooling water system at the power plant. In addition to capturing and releasing turtles from the plant's intake canal, we will also be conducting sea turtle nesting surveys on the northern 19 kilometers of Hutchinson Island. The Florida Power and Light project is extremely valuable conservation work, and generates a vast amount of data used by scientists and regulatory agencies. Analyzing and disseminating data collected from nesting surveys and captures at the intake canal will forward our mission goals and add to our understanding of marine species in coastal ecosystems.

We continued our exciting long term research project in the Key West National Wildlife Refuge in 2010, where we have been working since 2003 to census the sea turtles in the refuge and the habitats they use. This information will allow refuge managers to more effectively conserve both sea turtles and their habitats. Our discovery several years ago of a large assemblage of adult and subadult green turtles in the western Refuge continues to spark interest and generate research products. In 2010 we had a paper published in the journal *Endangered Species Research* on habitat partitioning and group foraging by green sea turtles within and adjacent to the Marquesas Keys. IRG has deployed satellite tracking tags and collected DNA samples from this unique assemblage of turtles, and we are in the process of analyzing data for dissemination and publication. We have also discovered another area within the Refuge that is home to a surprisingly abundant population of hawksbill sea turtles, and have received funding through the Florida Sea Turtle License Plate Grant program to study the population structure, growth rates, and genetic origins of this poorly understood species. We are currently looking for funding opportunities to continue this project in 2011. Public support is always welcome and helps Inwater Research Group reach our research goals.

With the continued assistance of our research collaborators, granting agencies, and donor and sponsor support, Inwater Research Group looks forward to continuing our mission to conduct high quality research and use those research products to further the conservation of marine species and their habitats in 2010 and beyond.

Michael J. Bresette
President, Inwater Research Group, Inc.



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2010 Milestones and Accomplishments

Research Projects:

Key West National Wildlife Refuge: The results of IRG's work in the western section of the Key West National Wildlife refuge on green turtles in the vicinity of the Marquesas Keys was published in the journal *Endangered Species Research*. The paper, titled "Size-class partitioning and herding in a foraging group of green turtles *Chelonia mydas*" is a result of our discovery that the green turtles in the Marquesas area have partitioned themselves by size into two very distinct assemblages, the smaller size individuals in the shallow seagrass habitats of Mooney Harbor, and the larger sized individuals in the deeper more open-water habitats of the adjacent Eastern Quicksands. Despite the very close proximity of these two areas, there was virtually no overlap in the size classes of green turtles present. The paper also documents the formation of foraging herds by the larger size class of turtles in the Eastern Quicksands. Other work by IRG in this fascinating eastern Quicksands area includes the application of GPS satellite tracking tags to large subadult and adult green turtles. These high-tech tracking devices allow for a very detailed and precise recording of movements and migrations.

Inwater Research Group received funding in 2009 through the Florida Sea Turtle License Plate Grant fund to initiate research into the hawksbill sea population in the Key West National Wildlife Refuge. This research will take advantage of our discovery in 2008 of a specific area within the refuge that has a high abundance of hawksbills that showed very strong site fidelity, which facilitates capture and recapture efficiency. Field work continued in 2010 to capture and tag hawksbills and collect morphometric and genetic information. These data will allow IRG to describe the size class structure and sex ratio of the population, calculate growth rates for juvenile and subadult hawksbills in the Refuge, and to determine the genetic origin (the geographic area where the individuals were hatched) through mitochondrial DNA analysis.

All of this work has stemmed from our long-term effort to characterize sea turtle populations in the Key West National Wildlife Refuge. That effort, underway since 2002, has produced extremely valuable results and has provided crucial information to refuge managers about how best to conserve and manage the Refuge. The continuation of this work has been identified by the Board of Directors as the highest priority for the future, and IRG is actively seeking long term funding for this effort.

Lake Worth Lagoon, Palm Beach County: Inwater Research Group has been conducting research to characterize the sea turtle populations of this large and urbanized estuarine system since 2005. This work has been funded by the Palm Beach County Department of Environmental Resource Management, in order to learn about the species of sea turtles that utilize the Lagoon

and the habitats in which they are found. In 2010, IRG conducted visual transect surveys throughout the 20-mile length of Lake Worth Lagoon, and capture efforts were focused on an area in the northern Lagoon near Little Munyon Island where the transect surveys had identified particularly high abundance. Information from this work is used by the County Environmental Resource Management staff in the planning and execution of their comprehensive restoration program for the Lagoon. Since sea turtles are such a high-profile species, the presence of sea turtles in the Lagoon and their dependence on the Lagoon as a developmental habitat helps raise public awareness about the progress and benefits of the restoration effort. 2010 was the fifth and final year of this research program, and IRG is working with County staff to find funding for its continuation.

Conservation and Environmental Monitoring Projects:

Florida Power and Light Company Sea Turtle Conservation Program: In 2009 Inwater Research Group was contracted by Florida Power and Light Company to conduct the sea turtle conservation program at the St. Lucie Nuclear Power Plant on Hutchinson Island. To fulfill this contract, IRG has biologists on site and on call 365 days a year to monitor the plants cooling water intake system and safely capture and release any sea turtles that become trapped in the canal. Data from these turtles are extremely valuable to the scientific community, and IRG will be collecting and managing this data set, as well as disseminating information collected through the FPL program via publications and presentations at scientific meetings and symposia. IRG has hired four full-time biologists to conduct this work.

Indian River County Nearshore Sea Turtle Abundance Surveys: In order to assess the potential effects of beach restoration projects on the adjacent nearshore reef that serves as developmental habitat for juvenile green turtles, IRG was contracted by Applied Technology and Management, Inc. to monitor sea turtle population levels before, during, and after project construction. IRG conducted visual surveys along fixed 3-km long transects just offshore of the beach restoration project areas, and in control areas outside the area of influence of the projects. Comparing data from before and after construction with concurrent data collected in the control areas allows for an assessment of project impacts. In 2009, IRG completed the 3-year monitoring of the Indian River County Sector 7 project, and the 3-year monitoring of the Sectors 1&2 project was completed in 2010. We are preparing a paper for publication in the *Journal of Coastal Research* summarizing our findings. We began another similar monitoring project in 2010 for the Indian River County Sector 3 project, under contract to Coastal Technology Corporation.

Palm Beach County Nearshore Sea Turtle Abundance Surveys: Inwater Research Group is conducting monitoring similar to the Indian River County project for Palm Beach County's beach restoration and shoreline protection projects. IRG is surveying the nearshore reef areas between Jupiter Inlet and Lake Worth Inlet to collect preconstruction baseline data on sea turtle abundance at three sites where future shoreline protection projects are planned, and at a control site at John D. MacArthur Beach State Park. Combined with future post-construction monitoring, these baseline data will allow for an assessment of project construction impacts.

Education and Public Outreach:

A major component of the mission of Inwater Research Group is the dissemination of our research results to the public and the scientific community, public outreach on marine conservation issues, and volunteer service to other marine research teams and the community. In 2010, IRG members presented results from our research at the 30th International Sea Turtle Symposium in Goa, India. One poster presented data on long-term loggerhead sea turtle capture rates at the St. Lucie Power Plant. Another poster used data from the power plant captures and our Key West National Wildlife refuge work, in combination with other projects, to document for the first time that Florida waters support all size classes of green turtles, from hatchling to adult, and identified specific habitats for each size class.

IRG members also take advantage of any opportunity to present the message of sea turtle and marine habitat conservation by speaking to school groups, civic organizations, and homeowners associations. In 2010, IRG staff gave presentations at the Environmental Studies Center of Martin County, The Florida Institute of Technology Biological Science Seminar Program, the Brevard Community College Professional Educator's Lecture Series, and the Orchid Island Homeowners Association.

Inwater Research Group has maintained a special relationship with the Environmental Studies Council of Martin County. This group serves over 10,000 K-12 public school students from 27 schools annually, providing environmental education and awareness programs. The Council has permits to maintain captive loggerhead turtles for educational purposes. These turtles serve as the centerpiece for education programs, and must be released when they reach sufficient size. In 2010, IRG pledged \$5000 to equip the turtle to be released this year with a satellite tracking tag, so students can follow the progress of "their" turtle after its release. Classes throughout the Martin County system will integrate updates from the satellite tracking into their course materials. IRG is also handling the permitting and application of the satellite tag for the Council.

Our concern for marine environments does not stop with sea turtles. In 2010, IRG commissioned the design and printing of an educational poster on the ecological value of beach wrack, the drifting algae and other plants that wash up on our beaches. Often regarded by coastal homeowners and local governments as a smelly nuisance, beach wrack actually supports a diverse community of invertebrates, provides forage for shorebirds, and is an important part of the sandy beach ecosystem. Our poster, to be distributed in 2011, will encourage readers to consider these values before embarking on beach raking or other misguided cleaning activities.

Since Inwater Research Group began the sea turtle conservation program at the St. Lucie Plant, IRG biologists, with the cooperation of FPL personnel, have collected hundreds of fish and other marine specimens for public education programs at the Florida Oceanographic Society and the Environmental Studies Center of Martin County.

Another important aspect of our mission is to provide assistance to other conservation organizations and resource agencies. That assistance may take the form of providing data or reviewing drafts of proposals or policies, or assistance in the execution of field projects or emergency response efforts. In 2010, the entire IRG staff donated their time and expertise to the recovery, treatment, transportation and release of thousands of sea turtles that were impacted by prolonged cold weather. This 2010 "cold stun" event was of historic proportions, involving over 5000 sea turtles throughout the State of Florida.



Supporters and Volunteers

Institutional Supporters:

Florida Sea Turtle Grants Program
U.S. Fish and Wildlife Service
Florida Fish and Wildlife Conservation Commission
National Marine Fisheries Service
Save a Turtle Foundation
Norcross Foundation
Disney Wildlife Fund
Brevard Zoo
Palm Beach County Environmental Resource Management
Underwater Engineering Services, Inc.
Maui Jim Sunglasses

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2010 Financial Statement

