



INWATER RESEARCH GROUP, INC



Annual Report

2012

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

Through our continued commitment to research, conservation and education, Inwater Research Group continued to be in the forefront of issues affecting marine turtles in the southeastern United States in 2012.

Our efforts continued to assess the damage from the catastrophic Deepwater Horizon oil spill in the Gulf of Mexico. In the summer and fall of 2012, IRG researchers provided field assistance to researchers from the National Oceanic and Atmospheric Administration Southeast Fisheries Center in capturing and satellite tagging small pelagic stage juvenile green, loggerhead, and Kemp's ridley sea turtles in the area of the 2010 spill offshore of Venice, Louisiana. This research will help shed some light on the very poorly understood migratory pathways of the age class of turtles perhaps most severely affected by the oil spill. In 2012, IRG received an anonymous grant from the Donor Advised Fidelity Trust that will aid in the continuation of our sea turtle work in the Gulf of Mexico in 2013.

In 2012, 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 also conducted 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 2012, where we have been working since 2003 to census the sea turtles in the refuge and characterize 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 additional publications. We have also discovered another area within the Refuge that is home to a surprisingly abundant population of hawksbill sea turtle. In 2012 IRG received additional funding through the Florida Sea Turtle License Plate Grant program to continue to study the population structure, growth rates, and genetic origins of this poorly understood species. We have currently secured some seed funding and are looking for additional funding opportunities to continue the Key West National Wildlife Refuge work in 2013. Public support is always welcome and helps Inwater Research Group reach our research goals.

In 2012, we also began what we hope will be another long-term research project in Florida waters, this one in the “Big Bend” area of the Florida west coast. The shallow marine habitats in this region represent important developmental areas for maturing sea turtles. With funding from the US Fish and Wildlife Service, we conducted a pilot study to evaluate sea turtle distribution and abundance in the St. Martins Keys and Big Bend Aquatic Preserves. This preliminary study was set up to evaluate potential areas for the creation of inwater index sites that will be used to assess long term changes in sea turtle abundance. Using the vessel based visual transect study method pioneered by IRG, we identified and mapped the occurrence of 150 green, Kemp’s ridley, and loggerhead sea turtles and were able to identify “hotspots” of particularly high sea turtle abundance. Research plans for 2013 will include capture efforts at study sites in the Big Bend to identify size class distributions, growth rates, genetic origins, and sex ratios of sea turtles found there.

With the continued assistance of our research collaborators, granting agencies, 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 2013 and beyond.

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



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Our Staff

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St. Lucie Power Plant Project



2012 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 2010 and 2011 through the Florida Sea Turtle License Plate Grant fund to conduct research into the hawksbill sea turtle population in the Key West National Wildlife Refuge. This research takes 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 2012 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. Results from the hawksbill project were presented at the Southeast Regional Sea Turtle Meeting in Jekyll Island, Georgia in February of 2012 and are currently being prepared for publication.

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 2003, 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. In 2012, IRG received an anonymous grant from the Donor Advised Fidelity Trust that will aid in the continuation of this project in 2013.

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 2012, under a contract with Palm Beach County, IRG began Phase IV of this project. In the fall of 2012, IRG conducted visual transect surveys throughout the 25-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. Results from this project were presented to the Palm Beach County Department of Environmental Resource Management in March of 2012 and are currently being prepared for publication.

Big Bend Developmental Habitats: In 2012, we began what we hope will be another long-term research project in Florida waters, this one in the “Big Bend” area of the Florida west coast. The shallow marine habitats in this region represent important developmental habitats for maturing sea turtles. With funding from the US Fish and Wildlife Service, we conducted a pilot project study to determine sea turtle distribution and abundance in the St. Martins Keys and Big Bend Aquatic Preserves and evaluate potential areas for the creation of inwater index sites to assess long term changes in sea turtle abundance. Using the vessel based visual transect study method pioneered by IRG, we identified and mapped the occurrence of 150 green, Kemp’s ridley, and loggerhead sea turtles and were able to identify “hotspots” of particularly high sea turtle abundance. Research plans for 2013 will include capture efforts in the Big Bend study sites to identify size class distributions, growth rates, genetic origins, and sex ratios of Big Bend turtles. In 2012, IRG received an anonymous grant from the Donor Advised Fidelity Trust that will aid in the continuation of this project in 2013.

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 five 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, data sharing and collaborations with other researchers, and presentations at scientific meetings and symposia. In 2012, IRG staff made two poster presentations of data from the power plant project at the 32nd International Sea Turtle

Symposium in Huatalco, Mexico and at the Southeast Regional Sea Turtle Meeting in Jekyll Island, Georgia. In 2012, IRG also researched and authored a Biological Assessment, required under the National Environmental Policy Act, on the modernization of the FPL Port Everglades Power Plant to a state of the art combined cycle power generation facility.

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 Coastal Technology Corporation to monitor sea turtle population levels before, during, and after construction of the Indian River County Sector 3 beach restoration project. In 2012, 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.

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. 2012 saw a continued expansion of our efforts in this important aspect of our mission, including the production of two additional educational posters on the ecology of the nearshore reef community and the biology and the conservation of the Atlantic Right Whale, the latter produced in collaboration with the organization Keepers of the Coast. All the posters in IRG's educational poster series are distributed free to educators through our website and to the public at a variety of environmental events that IRG participates in each year.

In 2011 and 2012 IRG continued a program of grants-in-aid to promising graduate students conducting cutting-edge research in sea turtle biology and conservation. Our first grant recipient was Simona Ceriani, a doctoral candidate at the University of Central Florida, who received \$5000 to support her work on the use of stable nitrogen and oxygen isotopes to identify foraging grounds and migrations of sea turtles along the east coast of the United States.

To promote the dissemination of research and to provide opportunities for networking, IRG board members served on the organizing committee and board of directors for the establishment of a major sea turtle research conference, the Southeast Regional Sea Turtle Meeting. The inaugural meeting was held in February 2012 at Jekyll Island Georgia, and was attended by over 400 participants, with future meetings planned to be held every other year. In addition to hundreds of hours of donated time, IRG also provided a \$5000 sponsorship for the meeting. IRG board member Rick Herren also served on the organizing committee and as conference registrar for the 33rd annual Symposium on Sea Turtle Biology and Conservation held in Baltimore, Maryland in February 2013. IRG Board members and staff forwarded our mission of research and conservation through speaking engagements at scientific meetings, symposia and local lecture series open to the general public. We also set up educational booths at various public festivals and scientific meetings.

Inwater Research Group also continued its efforts at educational outreach to primary and secondary school students in 2012. Board member Steve Traxler worked extensively with students at Oviedo High School in central Florida to develop a science fair project using IRG collected data to develop a fibropapilloma tumor scoring system for green turtles in relation to turtle length and weight. The project was selected as a state finalist in 2012. IRG also participated in the production of an episode of the *Ocean Rescue* television series on the rehabilitation of an injured loggerhead sea turtle at the Orlando, Florida Sea World facility. This series is aimed at promoting marine science and conservation for a teen and pre-teen audience.

Another important aspect of our mission is to provide assistance to other conservation organizations and resource agencies. This 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 2012, IRG donated the use of our specially equipped shallow water skiff and an operator to assist the Florida Fish and Wildlife Conservation Commission and the National Marine Fisheries Service research project to apply satellite tracking tags to reproductively active adult loggerheads in Florida Bay to track their movements between the Florida Bay foraging grounds and the nesting beaches. In the summer and fall of 2012, IRG researchers provided field assistance to researchers from the National Oceanic and Atmospheric Administration Southeast Fisheries Center in capturing and satellite tagging small pelagic stage juvenile green, loggerhead, and Kemp's ridley sea turtles in the area of the 2010 spill offshore of Venice, Louisiana. This research will help shed some light on the very poorly understood migratory pathways of the age class of turtles perhaps most severely affected by the oil spill.

Our work at the Florida Power and Light St. Lucie Plant in 2012 provided the opportunity for IRG staff to collaborate with several researchers by providing data, specimens and samples to support their research interests. IRG biologists collected blood samples and biopsies from loggerhead turtles to assist with a project conducted by University of Central Florida researchers looking at stable isotope analysis in sub-adult and adult loggerheads. IRG biologists also collected blood samples from juvenile green turtles to assist in a separate study by University of Central Florida researchers seeking to identify the sex of juvenile green turtles via

a host of blood parameters. Blood was taken from 8 loggerhead and green turtles captured in the canal to assist in a project conducted by Florida Atlantic University researchers investigating the immune response in marine turtles with fibropapilloma tumors. Also, dorsal and lateral pictures were taken from green sea turtles with an SSCL < 30cm to assist in a project conducted by a Florida Atlantic University researcher investigating changes in turtle shell morphology in relation to gape-limited predators. Extensive morphometric data were taken for a University of Tokyo student examining the morphological variation and taxonomy of green turtles. IRG biologists assisted in taking over 40 measurements of each green and loggerhead captured at the intake canal over 10 days to compare to measurements taken from turtles in the Pacific Ocean.



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
Florida Power and Light Co.

Individual Supporters:

Anonymous, from the Donor Advised Fidelity Trust
Janet Hochella
Thomas Dickinson
Suzy Murray
Wendy Gierhart
Elizabeth Gunn

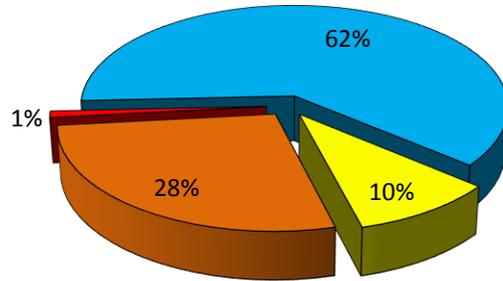
Volunteers:

Karrie Minch, Meghan Koperski
Dawn Witherington, Wanda Bresette, Laura Herren
Karen Holloway-Adkins, Mario Mota, Russ Scarpino
Brenda Boddiger, Stacy Kubis, Sue Schaf



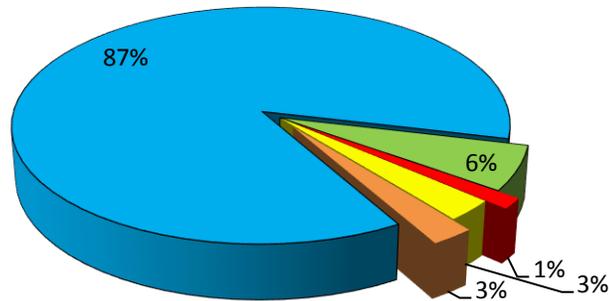
2012 Financial Statement

Revenue 2012, \$621,560



■ Grants ■ Government ■ Donations ■ Mission related contracts

Expenses 2012, \$559,101



■ Programatic ■ Outreach/Education ■ Travel ■ Administrative ■ Employee Benefits