

TECHNICAL REPORT

BROWARD COUNTY SEA TURTLE CONSERVATION PROGRAM 2015 REPORT

**For the
BROWARD COUNTY BOARD OF COMMISSIONERS**



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ACKNOWLEDGEMENTS

We would like to thank and acknowledge the tireless and dedicated efforts of the Nova Southeastern University, Broward County Sea Turtle Conservation Program staff. Their expertise, dedication and hard work have made the project a success.

A project of this magnitude cannot be accomplished without the assistance and cooperation of numerous individuals, groups and organizations. We would like to thank Rich Pick for servicing and transporting our ATVs at all hours of the day and night to keep the team operating throughout the season. We are grateful to the following individuals and groups for logistical support: Mr. Dan Dodge of the Hillsboro Club who provided a storage area for our ATVs, the Hollywood Beach and Hallandale Beach Maintenance Departments, Ft Lauderdale Beach Maintenance and Public Works Departments, Beach Rakers, and the Deerfield Beach Parks and Recreation Department. The Sea Turtle Conservancy has provided sea turtle and environmental awareness products to aid our outreach efforts. The Responsible Pier Initiative and Loggerhead Marine Life Center helping to keep our fishing piers clean and educate people about ways to respond to a sea turtle that has been hooked. We also acknowledge the park employees of the Broward County Parks and Recreation Division at Anne Kolb Nature Center who assisted in the hatchling release program.

We acknowledge and thank the following agencies and local governments for their support and guidance in the completion of this project. The Florida Department of Environmental Protection, Division of Recreation and Parks; The Florida Fish and Wildlife Conservation Commission, Florida Marine Research Institute; The Cities and Police Departments of Hallandale Beach, Hollywood, Dania Beach, Fort Lauderdale, the Town of Lauderdale-By-The-Sea, Pompano Beach, Deerfield Beach, and the Town of Hillsboro Beach; Code Enforcement Departments in Deerfield Beach, Hillsboro, Pompano Beach, Lauderdale-by-the-Sea, Fort Lauderdale, Hollywood and Hallandale Beach.

We would like to thank the Broward County Board of Commissioners for project funding and administration. Rick and Ryan Case and Rick Case Powerhouse for the donation of two new Honda Pioneer 500 Side-by-Side ATVs. We thank the National Save the Sea Turtle Foundation for organizing and executing the Adopt-a-Nest Program and donating funds to the program.

We would like to thank Richard and Zen Whitecloud and the staff and volunteers of the Sea Turtle Oversight Protection (S.T.O.P.) volunteer program, and Doug Young and the staff and volunteers of South Florida Audubon volunteer program for their dedicated hard work and for assistance with nest cage monitoring, stake preparation, and support throughout the season.

Finally we would like to thank all of the individuals and groups that participated in our education and outreach efforts this year making another great season for the BCSTCP and for Broward County's Sea Turtles!

EXECUTIVE SUMMARY

The Broward County Sea Turtle Conservation Program is funded and administered by the Broward County Board of Commissioners through the Environmental Planning and Community Resilience Division (BCEPCRD) and carried out by Nova Southeastern University to conduct sea turtle nesting surveys daily from March 1, 2015 – October 31, 2015 for all Broward County beaches except John U Lloyd State Park (Index Beach, monitored by Park staff). All loggerhead, green and leatherback turtle crawls (nests and false crawls) were identified to species and recorded by Geographic Positioning System (GPS). All nests were marked using wooden stakes and Red-Glo flagging tape and monitored throughout the season until they hatched or were determined to be non-viable. Reproductive success was investigated for a total of 2,172 nests after hatch-out (2,087 *in situ*, 41 Relocated, 44 Restraining Cage nests).

The 2015 sea turtle nesting season had the second highest nest numbers since the inception of the project/surveys in 1981, although earlier years may have slightly varied in survey area and season length. A total of 3,240 nests were deposited in Broward County from March 11, 2015 – October 10, 2015. Loggerhead turtles led the nesting again this year with 2,741 nests which is 135 less than last year, and still fell short of 2012, which had the highest loggerhead nesting on record (3,284 nests). However loggerheads still fell well above the 5-year average of 2,564 nests per season. Green turtle nesting set records in many parts of Florida this season and in Broward County we had 463 nests that fall just shy of the 2014 record green turtle season with 495 nests. This is not surprising as marine turtles have a biennial reproductive cycle where an individual may only return to nest every 2 years in most cases, so we would expect to see high nesting this season. What is interesting to see is that even in the slower years the numbers continue to show a historical overall nesting population increase. This season is nearly double the 5-year average of 268 nests. Leatherback turtles are the least common nesters in Broward County with 35 nests in 2015. The 2014 season had a very high leatherback-nesting season with 39 nests, so we would have expected to see a lower nest count this year, instead we saw almost the same number. The continual growth in leatherback nest numbers suggests that we may see a very active 2016-nesting season. With some of our leatherback track widths being quite small, this suggests we may be seeing some new nesting mothers in the area. The nesting this year was well above the 5-year average of 24 nests.

Nesting Success (Nests/(Nests + False Crawls)) averaged 41.2% for all species combined, 39.6% for loggerheads, 51.0% for greens, and 97.2% for leatherbacks. The combined species nesting success was 10% lower than the 2014 season and nearly 7% lower than the 5-year average of 48.0%. The loggerhead nesting success was much lower than 2014 (51.8% in 2014, 39.6% in 2015), and about 8% lower than the 5-year average of 47.6%. This drastic reduction in nesting success was seen in many regions of Florida in 2015 due to a very dry and hot month of June. This resulted in very high sand temperatures and dry sand that is difficult for turtles to nest in (dry sand collapses into the egg chamber as the mother digs the nest resulting in high numbers of false crawls and abandoned egg chambers). Green turtles and leatherbacks both showed a slight increase

in nesting success for the 2015 season compared to 2014. Green turtles were slightly lower than the 5-year average while leatherbacks showed a high nesting success about 12% above the 5-year average of 85.7%.

If we use an average of 80-120 eggs per nest (FWC) for all nests laid this season, we could potentially see as many as 259,200 – 388,800 eggs laid in Broward County during the 2015 season. However due to washout, some loss of nest markers, weather/beach conditions covering evidence of hatchout, etc not all nests that hatched were inventoried. A total of 2087 *in situ* nests were evaluated post hatching for hatchling success (1807 Loggerhead, 253 Green, 27 Leatherback) resulting in a total of 217,188 eggs and 144,546 “Hatchlings released” documented from inventoried nests in 2015 with a hatching success for all inventoried *in situ* nests of 64.1%. Like nesting success, hatching success for loggerhead nests in 2015 was greatly reduced compared to previous years. This reduction is likely due to the extreme dry/hot weather experienced early in the season. Many nests seem to have reached temperatures too high for development at least in the top part of the egg clutch as we encountered large numbers of unhatched eggs at the top of the egg chamber with the hatched eggs towards the bottom of the nest. The number of nests that were relocated was the lowest on record for the project with only 43 nests (all species) and 1.39% of all nests being relocated this year. This is down slightly from the 50 nests and 1.64% of nests that were relocated in 2014, and supports the “hands off” conservation approach. Forty-one relocated nests were excavated and investigated for post hatching success. This resulted in a total of 4039 eggs laid (in inventoried nests) and 2448 “hatchlings released” for a hatching success for inventoried relocated nests of 52.2%.

The Hillsboro and Deerfield Beach survey zone had the most active nesting in Broward County with an average of 183.14 nests/km (294.73 nests/mile) (all species combined). The Hollywood Beach survey zone has the lowest nesting density with an average of 17.13 nests/km (27.57 nests/mile) (all species combined). This nesting distribution could be influenced by a number of factors. Hillsboro has historically housed an active sea turtle “hatchery” facility where nests were transported from other areas of Broward County and relocated into a fenced facility until hatchout. Likewise, historically nests have been relocated out of Hollywood Beach. Both the hatchery and historical relocation may also account for some of the nest distribution we see in Broward County today.

Our program monitored sea turtle nesting activity in relationship to three renourishment projects in recent years and 1 active maintenance/bypass project:

- Broward County Segment II Beach Renourishment and Restoration Project (R36-R41, R51-R72), survey prior to sand placement
- Flood Control and Coastal Emergency Beach Erosion Control (FCCE) Truck Haul Project in Pompano Beach (R26-R53), sand placement concluded in November 2013
- Hillsboro/Deerfield Beach Nourishment Project (R6-R8) sand placement concluded on April 11, 2011.
- Hillsboro Inlet Maintenance & Sand Bypass Project, Hillsboro Beach (R25-R26)

INTRODUCTION

Since 1978, the Broward County Environmental Planning and Community Resilience Division (BCEPCRD) and Broward County Board of Commissioners has provided for the conservation of endangered and threatened sea turtles in Broward County, Florida. Florida coastlines experience some of the heaviest sea turtle nesting in the United States. Broward County is in the normal nesting ranges of three species of sea turtles: the Loggerhead sea turtle (*Caretta caretta*), the Green sea turtle (*Chelonia mydas*), and the Leatherback sea turtle (*Dermochelys coriacea*). In the coastal waters around Broward County the Kemp's Ridley sea turtle (*Lepidochelys kempi*) and the Hawksbill sea turtle (*Eretmochelys imbricata*) can also be found, but do not nest regularly in the area. The loggerhead is listed as threatened in this region, while the green and leatherback sea turtles are categorized as endangered under the U.S. Endangered Species Act of 1973 and Florida's Marine Turtle Protection Act (379.2431, Florida Statutes).

These statutes protect all life history stages of sea turtles and therefore all conservation, monitoring, or research efforts require permitting by the Florida Fish and Wildlife Commission (FFWC) that is administered by the U.S. Fish and Wildlife Service (USFWS) for sea turtles on land. The National Oceanic and Atmospheric Association (NOAA) protects all in-water turtles. All monitoring and conservation efforts for this project were administered and supported by the Broward County Environmental Planning and Community Resilience Division and conducted by Nova Southeastern University, Broward County Sea Turtle Conservation Program (BCSTCP).

Beach Re-nourishment Projects

Coastal development alters the natural accumulation and loss of sand on Broward County's beaches. Broward County's highly developed, urbanized and armored coastline and beachfront calls for needed maintenance of beach profiles, beach width, and dune structures. To help mitigate erosion along sections of Broward County beaches, intermittent beach renourishment projects have been established in some areas of the County to ensure the continuation of coastal preservation, beach recreation and infrastructure protection. The BCEPCRD has maintained the sea turtle conservation and monitoring program in years with and without sand placement projects, to better understand the long and short-term impacts of sand placement projects on nesting sea turtles. There have been four County sponsored renourishment projects in recent years:

- Broward County Segment II Beach Renourishment and Restoration Project (R36-R41, R51-R72) (Pre Beach Placement Survey)
- Flood Control and Coastal Emergency Beach Erosion Control (FCCE) Truck Haul Project in Pompano Beach (R26-R53), approximately 115,000 cubic yards of sand was scheduled to be placed in this area, sand placement concluded in November 2013
- Hillsboro/Deerfield Beach Nourishment Project (R6-R8) sand placement concluded on April 11, 2011.

- Hillsboro Inlet Maintenance and Sand Bypass Project in Hillsboro Beach (R25-R26)

Seasonal Challenges

Both the nesting and hatching success of Broward County sea turtle nests were impacted by weather driven factors such as Tropical Storm Erika and extreme hot and dry conditions. The Atlantic hurricane season was quite benign this year, however Erika impacted Broward County on August 28 – September 1, 2015. The storm travelled far offshore, however storm surge and wave action coupled with a particularly high tide (King Tide August 29 – September 2) event causing extensive washover and washout events across active sea turtle nests on the beach in Broward County.

In addition, South Florida and the Ft Lauderdale area in particular experienced a period of extremely hot and dry conditions that led to extreme drought conditions early in the season (NOAA National Weather Service, 2015). This was apparent on the beach as the sand would not keep form (as it normally does) when surveyors would excavate the sea turtle nests. These el Niño conditions seemingly made nesting for sea turtles particularly difficult, with a sharp increase in false crawls and more abandoned egg chambers than in previous years. Ft Lauderdale documented its 3rd driest summer on record with less than 10 inches of rain (June-August) (National Weather Service Forecast Office).

Project Goals

The Broward County Sea Turtle Conservation Program goals in 2015:

- 1) Conduct Daily Sea Turtle Nesting Surveys and Beach Monitoring for Mechanical Beach Cleaning and Various Permitted Projects and Beach Events
- 2) Relocate or Protect Imperiled Sea Turtle Nests to Maximize Hatchling Survival
- 3) Conduct Nest Evaluations and Monitoring to Examine Hatchling Success
- 4) Conduct Stranding and Salvage Activities and Maintain a 24-Hour Sea Turtle Emergency Hotline
- 5) Inform and Educate the Public Through Educational Seminars, Public Hatchling Releases, and Table Events About Sea Turtles and Sea Turtle Conservation/Management
- 6) Provide Accurate and Timely Reporting

MATERIALS AND METHODS

Personnel

The Program works with a protected species, therefore all sea turtle monitoring and work is authorized by Florida Fish and Wildlife Conservation Commission (FFWCC),

Imperiled Species Management Section, Marine Turtle Permits #214, #215, #148 issued to Curtis Slagle (Jan 1, 2015 – December 31, 2015) that allows the work to be conducted by permitted individuals. The FWCC Marine Turtle permit, Guidelines, and the contract with Broward County were used to set procedures for all monitoring, stranding, and survey protocols for this program.

2015 Broward County Sea Turtle Conservation Staff:

Courtney Kiel – Broward County Contract Administrator
 Derek Burkholder – Principle Investigator
 Curtis Slagle – Project Manager / Permit Holder
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Sea Turtle Nesting Surveys

Daily sea turtle nesting surveys were conducted by BCSTCP staff from March 1, 2015 – October 31, 2015 (a month longer in some areas than previous years surveyed) for all Broward County beaches (24 miles) except John U Lloyd State Park (2.4 miles) (Figure 1), which was surveyed by park rangers who provided the data for this survey area. Surveys began 30 minutes before sunrise each day and were conducted using all-terrain vehicles (ATVs – Honda Rancher 500, Honda Pioneer 500 Side x Side, Polaris Sportsman Touring 570). For survey purposes Broward County was divided into 5 survey zones; Hillsboro-Deerfield Beach (Hillsboro), Pompano Beach including Lauderdale-by-the-Sea (Pompano), Fort Lauderdale, John U. Lloyd State Park, and Hollywood-Hallandale including Dania Beach (Hollywood) (Table 1). For all survey

zones, except John U Lloyd State Park, nest locations were referenced to Florida Department of Environmental Protection (FDEP) survey monuments numbered consecutively (North to South) from R1 – R128. The location of Broward County and survey zone boundary lines are shown in Figure 1A-F.

All nesting and non-nesting emergences, or false crawls, were recorded and locations marked by GPS when they were first encountered on the survey. Data was recorded on paper datasheets and electronically using a Nexus 7 tablet with the VJGames GPS Coordinates Application in the field. This tablet system uses GPS, Wi-Fi, and mobile networks to determine location. Use of the tablets in inclement weather proved to be difficult. Therefore, all nests were additionally marked with a Trimble GeoExplorer 6000 Series or Trimble GeoExplorer 2008 Series (<1m accuracy) to allow for precise nest reestablishment throughout the season if necessary (stakes lost, nest washout, vandalism, etc). Nest GPS position is taken over the center of the clutch when known, or at the apex of the crawl. To ensure crawls are not double counted, after all data is collected from a crawl/nest and it is marked accordingly, the crawl marks (not the nest site) are driven over with the ATV to indicate they have already been documented.

For each crawl encountered, data was collected on paper data sheets and in an electronic datasheet on the Nexus tablet. At each site data was collected for:

- 1) Survey Zone Referenced to Nearest Property and R-Zone Monument Marker
- 2) Crawl Type (Nest or False Crawl)
- 3) Each Crawl/Nest Given a Unique Identifier Number (Beach Code/Nest or False Crawl Number)
- 4) Date of Crawl
- 5) Species
- 6) Measurement From Apex of Crawl/Nest to High Tide Line (HTL)
- 7) Crawl Characteristics (e.g. Crawl Width, # Body Pits, Orientation Circles, Etc)
- 8) Fate of Nest (In-situ, Relocation, Additional Protection)
- 9) Whether a Turtle Encountered an Obstruction (ONA)
- 10) Whether a Turtle Disoriented (DIS)

Treatment Zones

Survey Zones were further broken down into “Treatment Zones” based on different management tools to be used to help control unwanted natural and anthropogenic influences in the area (Table 2, Figure 2A-V). Treatment zones were broken down into “Donor”, “Restraining Cage”, “*in situ* and Recipient”, or “Recipient” categories. Zone designations with R-Monument boundaries are outlined in Table 2.

- In a “Donor” zone, all loggerhead, green, and leatherback turtle nests are to be relocated to the nearest “Recipient” zone. R-24 – Hillsboro Inlet and R85 – Port Everglades Channel are “Donor” zones and use of Restraining Cages is not authorized in this zone for any species.

- A “Restraining Cage” Zone is defined as every other loggerhead nest in this zone will be outfitted with a Restraining cage when the nest incubation reaches 45 days, the remaining nests will be left *in situ* with no additional protection.
- An “*in situ*/Recipient” zone is defined as a zone where all nests will remain *in situ* and may accept any nests relocated from “Donor” zones. Restraining cages should not be used in these areas for lighting purposes.
- An “*in situ*” only zone is defined as a zone where all nests should be left *in situ* and no nests should be relocated into this zone from “Donor” zones. Restraining cages may be used in these zones after FWC approval (Table 2, Figure 2A-V).

All nests left “*in situ*” were marked with a minimum of 4 stakes (1 Signed, 3 non-signed stakes) with a circle of bright “Red-Glo” flagging tape with a radius of at least 3 feet centered on the clutch. The top of the signed stake was painted white to facilitate clear data recording on the stake. For sites where a clear dig sight cannot be identified, the whole area of disturbed sand should be encircled with bright tape. If during the course of the season, the nest markers are lost/washed away/vandalized/etc the nest can be re-established using the Trimble sub-meter GPS units. Upon reestablishment nests were marked with a circle of bright (Red-Glo) flagging tape with at least a 5 ft radius centered on the nest site.

Nest Relocation

Nests deposited in areas that were deemed “At Risk/Donor Zones” by FFWCC or that were laid below the previous night’s high tide line were relocated either west of the original nest location if laid below the high tide line, or were relocated to the nearest recipient zone if laid in a donor zone to ensure highest possible hatchling success. All nests were relocated before 9am the morning they were deposited. Each nest was carefully dug by hand and the eggs were transported in buckets containing damp sand from the original nest chamber. Special care was taken to leave eggs in their natural orientation (how they were sitting in the original chamber created by the nesting mother) to minimize possible injury to the embryos during transportation. A new “nest chamber” was dug by hand, eggs placed in the chamber and then reburied by the marine turtle specialists as per FWC Marine Turtle Guidelines.

Relocated nests were marked with 3 stakes (1 sign stake, 2 unsigned stakes) in a triangle with the egg chamber in the middle and surrounded with a bright “Red-Glo” flagging tape. All relocated nests were evaluated post-hatching for hatchling success unless extenuating circumstances (washout, vandalism, etc) made post-hatching analysis impossible.

Restraining Cages

Restraining cages were used as a temporary management tool for zones of high artificial lighting trespass on the beach (Figure 2A-V). In all “Cage” zones, egg chambers were located for each nest during the daily survey and nests marked as per standard procedures. Cages were constructed for every other nest in the “Cage” zones. Cages were deployed at the beginning of the hatch-out window and monitored until hatch-out (plus at least 72 hours before nests were excavated and assessed for hatchling emergence success) or until 70 days at which time the cage would be pulled and the nest excavated.

Cages were constructed of a thick plastic mesh (2cm x 2cm mesh) lined with window screen on the inside of the cage to minimize hatchling entanglement in the cage and protect hatchlings from predators that may reach through the mesh. Cages were a cylinder (60cm diameter) centered over the egg chamber, with a flat mesh top secured in place and an access hatch in the top to facilitate hatchling release (Appendix 4A). Additionally a door was cut into the ocean facing side of the cage that was opened during the day, so hatchlings that may emerge and not be stuck desiccating in the cage during the heat of the day (Appendix 4A). An informative sign was affixed to the outside with the pertinent response phone numbers if a turtle was found in the cage (Appendix 4B).

For cage construction, the enclosure was placed centered over the top of the egg chamber, a trench was dug around the base of the cage, and the base of the cage was buried in the ground 4-6 inches, and then secured to stakes to hold it in place. Daily cage monitoring consisted of closing the ground level access door at sunset each day, checking the cage for hatchling activity at least once between 23:00 and 01:00 each night (any hatchlings encountered were removed from the cage and released), and opening the ground level access door at sunrise each morning.

Nest Evaluation/Hatchling Success

When possible, nests were excavated and assessed for reproductive success at least 72-hours post nest hatchout. If hatchout was not observed, nests were excavated and assessed after a 70 day incubation period for green and loggerhead nests and 80 days for leatherback turtles, after that time the nests are no longer considered viable.

Nests were dug by hand and inventoried. For each nest the following data was collected:

- 1) Number of Eggs
- 2) Live In Nest (LIN)
- 3) Dead In Nest (DIN)
- 4) Live Pipped (LPIP)
- 5) Dead Pipped (DPIP)
- 6) Visual Development (VD)
- 7) No Visual Development (NVD)
- 8) White (fertilized egg)

Number of hatchlings released for each nest was determined as Total Number of Eggs minus DIN, DPIP, and unhatched eggs showing visible development (VD) or no visual development (NVD). Live hatchling production success was defined as the number of released hatchlings divided by the Total number of Eggs.

Lighting Surveys

Surveys for artificial lighting on Broward County beaches were conducted once each month between March and September 2015 for all survey zones. Surveyors walked each section of beach after dark (commencing between 22:00 and 00:00) to document light fixtures that could potentially confuse sea turtles. Survey protocols followed standard techniques as described by the FFWC Technical Report: Understanding, Assessing, and Resolving Light-Pollution Problems on Sea Turtle Nesting Beaches (Blair E. Witherington and R. Erik Martin 1996) and Section 62B-55, Florida Administrative Code (FAC) a Model Ordinance for Marine Turtle Protection indicated friendly and unfriendly fixtures/bulbs depending on fixture type and treatment, bulb type, light wavelength etc. All lights/fixtures that may impact sea turtle nesting or hatchling behavior were documented on a standardized “BCSTCP Lighting Survey Data Sheet” which is broken down by light/fixture type and property/address (Appendix 5). Each coastal municipality in Broward County adopted and enforces their own local Sea Turtle Friendly Lighting Ordinance. These ordinances vary slightly, but follow the general rule of thumb outlined in the Model Ordinance. A list of common lighting types found in Broward County can be found in Appendix 6 and are more fully outlined in the Technical Report Supplement: Broward County Sea turtle Conservation Program Lighting Survey 2014 Report (Kiel, C 2015). When possible, each surveyor worked the same section of beach each month to allow the highest level of familiarity with the properties surveyed, minimizing human error and discretion thus providing a better long-term tracking of lighting non-compliance throughout the season.

Lighting survey reports were submitted to the Broward County Contract Administrator and FWC ISM staff monthly. These reports ultimately were sent to Code Enforcers in each Broward County coastal municipality for targeted rectification and enforcement actions if necessary.

Strandings

A Sea Turtle Emergency Line is monitored 24 hours/day in Broward County and most members of our program are trained to respond to sea turtle strandings. When a call comes into the emergency line a member of our Sea Turtle Stranding Team is dispatched with a stranding kit, which contains all of the necessary equipment (pit tag reader, measuring tape, data sheets, scalpel, forceps, camera, pens/pencils, spray paint, GPS unit, etc) to document the event. If a call is in response to a dead stranding, we will determine turtle species, sex, take morphometric measurements, document all notable injuries, photograph the animal and all injuries, scan for pit and flipper tags for identification, and when all data is collected will usually bury the turtle on or just off the beach. If the animal is in the water or too large to move, we mark the shell with spray paint, so we

know that it is a documented animal. If we are responding to a live stranding, we will collect species, size and record whether or not it has fibropapilloma tumors. Once this information is collected we contact the FWC Florida Sea Turtle Stranding and Salvage Network Coordinator to determine what will be done with the individual (where it will be transported, etc). A summary of the BCSTCP Stranding Responses can be found in Appendix 1a, an example stranding response data form can be found in Appendix 1b.

Sea Turtle and Hatchling Disorientation Events and Obstructed Nesting Attempts (ONA)

Two volunteer organizations: Sea Turtle Oversight Protection (S.T.O.P) and South Florida Audubon Sea Turtle Volunteer Organization had a strong presence on the Broward County beaches again this year monitoring nest hatch outs at night and reported disorientation events separately from the BCSTCP. Thus the BCSTCP data only represents a small amount of the disorientation reports filed in Broward County each year. When an organization (BCSTCP, S.T.O.P., Audubon) recorded a disorientation event and files a Marine Turtle Hatchling Disorientation Incident Report Form, the nest was marked with colored flagging tape marked with the date of hatchout to avoid report duplication.

When a nesting female encountered some obstruction (escarpment, beach furniture, sea wall, rocks, etc) that impacted her nesting attempt by causing her to change directs, causing her to become entangles, etc were recorded as an Obstructed Nesting Attempt (ONA).

Education and Outreach Initiatives

One of the leading missions of the Broward County Sea Turtle Conservation Program and Nova Southeastern University, Halmos College of Natural Sciences and Oceanography is community outreach and education. Sea Turtles are a large part of life in South Florida and we believe education of residents and visitors alike about the importance of sea turtles and other marine life in our coastal habitats and on the beaches is paramount to continuing the conservation and management of these endangered species.

Data Management and Analysis

Data was recorded on paper datasheets and electronically using a Nexus 7 tablet with the VJGames GPS Coordinates Application in the field. Data was entered daily into an Excel spreadsheet and all datasheets were photocopied and originals are held until all analysis and reporting requirements are complete. All data was verified by at least one additional person once the data was entered and before analysis. Data analyzed and presented in this report was compiled/analyzed using Microsoft Excel 2008 for Mac and JMP Pro 12. All maps were constructed in ESRI ArcMap 10.3 (GCS North American NAD 1983 projection). Historical nesting, hatchling success trends, and reproductive success were analyzed using Analysis of Variance (ANOVA) for Linear Regression.

RESULTS

Sea Turtle Nesting Surveys

The 2015 Sea Turtle Nesting Survey in Broward County started on March 1, 2015, and the first crawl of the season was a Leatherback nest on March 11, 2015. A total of 7,822 emergences were documented for all Broward County combined resulting in 3,240 Nests and 4,582 False Crawls (Figure 3) or a 41.4% Nesting Success (Figure 4). This is well below last year's Nesting Success at 51.8%, and is still well below the 5-year average nesting success for all species of 48.84%.

Following the general trend, leatherback turtles are the first species to nest in Broward County, followed by Loggerhead turtles, and the Green turtles nesting later in the season (Figure 5).

Loggerhead Sea Turtles (*Caretta caretta*)

Overall Nesting Activity

Loggerhead nesting again made up the majority of the nesting activity in Broward County in 2015. A total of 6,877 crawls were recorded for loggerhead turtles in all of Broward County. Resulting in 2,741 Nests and 4,136 False Crawls for a County wide nesting success of 39.62%. This represents over a 12% decrease in nesting success from last year (51.79%) and is nearly 8% lower than the 5-year average of 47.55% and represents the lowest Nesting Success for Loggerhead turtles County wide since 2004 (Figure 6). Since 2000 nesting success has remained fairly stable with some up and down over the years, however regression analysis does not show a significant positive or negative trend over this time period $y = -0.0008x + 0.4658$, $R^2 = 0.0072$, $P = 0.75$ (Figure 6). This nesting represents a nest density (County wide) of 71.01 nests/km, which is slightly lower than the 74.51 nests/km experienced during the 2014 season. Loggerhead nesting has experienced a significant increase over the life of the program with an average increase of 30.5 nests per year from 1981 – 2015. Regression shows a highly significant positive trend $y = 30.496x + 1463.1$, $R^2 = 0.3407$, $P < 0.001$ (Figure 7). Sea turtle nesting in Broward has been surveyed since 1981; however there have likely been some variance in the annual survey effort as the project has progressed.

Temporal Patterns

The first loggerhead nest was deposited on April 16, 2015 and the first loggerhead false crawl was documented on April 22, 2015. Highest daily nesting was June 4, 2015 with 60 nests laid in Broward County. The last loggerhead nest was deposited on August 28, 2015, and the last false crawl recorded on August 25, 2015 (Figure 5).

Spatial Patterns

Loggerhead nests and false crawls were recorded in all survey zones with an average of 114.69 nests/mile. Hollywood showed the lowest Loggerhead nesting with 26.03 nests/mile and Hillsboro experienced the highest nesting with 220.70 nests/mile. (Table 3).

Incubation Periods

Incubation periods were determined for 1717 loggerhead nests left *in situ* on Broward County Beaches (minus John U Lloyd) in 2015. Incubation ranged from 42 – 69 days with a mean incubation period of 49.71 days. This falls well within the expected incubation range for loggerhead turtles in spite of the very hot and dry conditions early in the nesting season.

Reproductive Success

Reproductive success was investigated in 1807 *in situ* loggerhead nests across Broward County (excluding John U Lloyd) in 2015. In these evaluated nests 185,157 eggs were laid resulting in 120,706 “hatchlings released” for a release success rate of 63.1% (Table 6). This is about 100 fewer nests evaluated than during the 2014 season, but represents nearly a 20% lower hatchling released success rate than last year.

Table 7 shows the fate of each egg deposited in the evaluated loggerhead nests left *in situ*, relocated, and cages outfitted with hatchling restraining cages. The highest “hatchling emergence” percentages came from nests evaluated in Pompano Beach with a success rate of 68.7%, the lowest was in Hillsboro Beach at 56.0%. This may be attributed to the higher predation rates in Hillsboro Beach, and the late season inundation associated with Tropical Storm Erika.

Green Sea Turtles (*Chelonia mydas*)

Overall Nesting Activity

Green turtles are historically the second highest nesters in Broward County. This trend continued again for the 2015-nesting season. A total of 908 crawls were recorded for green turtles in all of Broward County. Resulting in 463 Nests and 445 False Crawls for a Broward County wide green turtle nesting success of 50.99%. Since 2000 nesting success has seen a moderate increase over the years, regression analysis shows a moderately significant positive trend ($P = 0.057$) over this time period $y = 0.0082x + 0.4138$, $R^2 = 0.23487$ (Figure 6). Like the loggerhead turtles, green nesting has experienced a significant increase over the life of the program with an average increase of 7.6 nests per year from 1981 – 2015. Regression shows a highly significant positive trend $y = 7.5566x - 17.652$, $R^2 = 0.5101$, $P < 0.001$ (Figure 7).

Temporal Patterns

The first green turtle nest was deposited on May 17, 2015 and the first green turtle false crawl was documented on May 17, 2015. Highest daily nesting was June 25, 2015 with 14 nests laid in Broward County. The last green turtle nest was deposited on October 10, 2015, and the last false crawl was recorded on October 10, 2015 (Figure 5).

Spatial Patterns

Green turtle nests and false crawls were recorded in all survey zones with a countywide green turtle average of 19.37 nests/mile. The highest green nesting was in Hillsboro with 74.65 nests/mile, and the lowest in Hollywood with 1.21 nests/mile (Table 3).

Incubation Periods

Incubation periods were determined for 251 green turtle nests left *in situ* on Broward County Beaches (minus John U Lloyd) in 2015. Incubation ranged from 42 - 63 days with a mean incubation period of 50.24 days. This falls well within the expected range of green turtle incubation periods.

Reproductive Success

Reproductive success was evaluated for 253 green turtle nests that were left *in situ* in 2015. There were 29,578 eggs deposited in the evaluated nests resulting in 22,437 “hatchlings released” for a release success rate of 73.2% (Table 6). The 2015 season had a much higher number of green turtle nests deposited compared to 2014 and therefore had more nests evaluated (251 vs. 72 in 2014), however the hatchling release success rate was about 13% less than that recorded in 2014.

Table 8 shows the fate of each egg in evaluated green turtle nests broken down by beach location, *in situ*, and relocated nests. The highest emergence percentage for *in situ* nests was found on Fort Lauderdale Beach at 80.8% and the lowest on Hollywood Beach at 60.9%.

Leatherback Sea Turtles (*Dermochelys coriacea*)

Overall Nesting Activity

Leatherback turtles are historically the lowest nesting species in Broward County. This trend continued again for the 2015 season. A total of 36 crawls were recorded in all of Broward County resulting in 35 nests and 1 false crawl for a Countywide nesting success for leatherback turtles of 97.22%. Since 2000, nesting success has remained fairly stable over the years, regression analysis does not show a significant positive or negative trend ($P = 0.87$) over this time period $y = 0.0009x + 0.8311$, $R^2 = 0.00186$ (Figure 6). Like the

loggerhead and green turtles, leatherback nesting has experienced a significant increase over the life of the program with an average increase of 0.74 nests per year from 1981 – 2015. Regression shows a highly significant positive trend $y = 0.7352x + 2.7807$, $R^2 = 0.2816$, $P = 0.001$ (Figure 7).

Temporal Patterns

The first leatherback nest was deposited on March 11, 2015 and the first leatherback false crawl was documented on May 10, 2015. Highest daily nesting was May 5, 2015 with 4 nests laid in Broward County. The last leatherback nest was deposited on June 28, 2015, and the last False Crawl was recorded on May 10, 2015 (Figure 5).

Spatial Patterns

Leatherback crawls were recorded in all survey zones, however Hillsboro Beach zone was the only beach to have a false crawl. Countywide leatherback turtles showed an average of 1.46 nests/mile. The highest leatherback nesting zone was Hillsboro with 2.79 nests/mile and lowest in John U Lloyd with 0.42 nests/mile (Table 3).

Incubation Periods

Incubation periods were determined for 27 leatherback nests left *in situ* on Broward County beaches (minus John U Lloyd) in 2015. The overall 2015 season incubation periods ranged from 55 – 71 days with a mean incubation period of 61.63 days.

Reproductive Success

Reproductive success was assessed for 27 leatherback nests left *in situ* in Broward County. The 27 nests resulted in 2,453 eggs and 1,403 hatchlings released for a Hatchling Release Success rate of 51.5% (Table 6). This represents a nearly 17% lower release rate than 2014 with a hatchling release success rate of 77.8% for *in situ* leatherback nests. Hatchling success is generally lower for the leatherback species. Most of the evaluated nests were from Hillsboro Beach, which also had the lowest hatchling emerged percentages at 41.1%. Hollywood Beach had the highest percentage at 76.34% (Table 9). However these are based on low sample sizes.

Beach Re-Nourishment Projects

Broward County Segment II Project

To date there has been no sand placed for this project. The project proposes placing 706,700 cubic yards of sand across 4.9 miles of beach. This year was monitored as a pre-sand monitoring season. This will provide baseline data to compare the before and after sand placement impacts no nest and hatch success.

Nesting Success

The Broward County Segment II Project (R36-R41; R51-R72) accounted for 625 loggerhead nests and 692 false crawls for a nesting success rate of 47.46% (Table 10). Green turtles laid 71 nests in the fill area and 82 false crawls for a nesting success of 46.41%, and there were 4 leatherback nests and no false crawls for a nesting success of 100% in the project area.

Reproductive Success

The Broward County Segment II Project (R36-R41; R51-R72) had 483 loggerhead nests that were evaluated for reproductive success. These nests resulted in 51,244 eggs and 37,292 hatchlings released for a release success of 72.8% (Table 11). There were 54 green turtle nests evaluated resulting in 6,530 eggs and 5,667 hatchlings released for a release success of 86.8%. There were 4 leatherback nests evaluated resulting in 333 eggs and 241 hatchlings released for a release success of 72.4%.

Hillsboro/Deerfield Beach Nourishment Project

This was a small renourishment project that placed approximately 375,000 cubic yards of sand across 7,175 linear feet of shoreline miles and saw the last sand placed April 11, 2011. In 2015 an amendment to this project proposed placing an additional 50,000 cubic yards of truck haul fill from Broward County Borrow Area 1 (BA-1) in the same 7,175 linear feet of shoreline.

Nesting Success

The Hillsboro/Deerfield Beach Nourishment Project (R6-R8) accounted for 34 loggerhead nests and 64 false crawls for a loggerhead nesting success of 34.69% (Table 10). Green turtles laid 7 nests in the fill area and made 6 false crawls for a green nesting success of 53.85%. There were no leatherback nests or false crawls in the project area (Table 10).

Reproductive Success

The Hillsboro/Deerfield Beach Nourishment Project (R6-R8) had a total of 34 loggerhead nests within the project area. Of the 34 nests, 25 nests were evaluated for nesting reproductive success. The 25 nests resulted in 2,470 eggs with 2,017 hatchlings released for a release success of 81.7%. There were 6 evaluated green turtle nests that resulted in 554 eggs with 499 hatchlings released for a release success of 90.1%. There were no leatherback nests evaluated in the project area (Table 11).

Flood Control and Coastal Emergency Beach Erosion Control (FCCE) Truck Haul Project

This is the second year of post project monitoring (sand laid 2012) for the Flood Control and Coastal Emergency Beach Erosion Control (FCCE) Truck Haul Project at Pompano Beach (R26-R53). This project impacted one of the longest extents of beach of any of the recent projects with 115,000 cubic yards of sand being placed across 5.1 miles of critically eroded coastline.

Nesting Success

The fill area had 536 loggerhead nests and 715 false crawls for a loggerhead nesting success in the fill zone of 42.85% (Table 10). This is very similar to the 39.86% nesting success for loggerhead turtles across all beaches in Broward County this nesting season (Table 4). Green turtles laid 23 nests and 26 false crawls for a nesting success of 46.94%. Leatherbacks laid 4 nests and 0 false crawls for a nesting success of 100% in the project area (Table 10).

Reproductive Success

The Flood Control and Coastal Emergency Beach Erosion Control (FCCE) Truck Haul Project had 419 loggerhead nests that were evaluated for reproductive success. These nests resulted in 45,272 eggs and 32,181 hatchlings released for a release success of 71.1%. There were 21 green turtle nests evaluated for reproductive success resulting in 2,490 eggs and 2,002 hatchlings released for a release success of 80.4%. There were 12 leatherback nests that were evaluated for reproductive success resulting in 1,129 eggs and 644 hatchlings released for a release success of 57.0% (Table 11).

Hillsboro Inlet Maintenance and Sand Bypass Project

This is a small maintenance and sand bypass project at the Hillsboro Inlet and moves sand as necessary across a 0.21 mile stretch of beach.

Nesting Success

The Hillsboro Inlet Maintenance and Sand Bypass Project in Hillsboro Beach (R25-R26) is a small area that only impacted 11 loggerhead nests and 26 false crawls leaving a loggerhead nesting success in this project area of 29.73% (Table 10). This is down significantly from the 52.19% loggerhead nesting success in 2014. There were no green or leatherback nests or false crawls in this area this season.

Reproductive Success

The Hillsboro Inlet Maintenance and Sand Bypass Project in Hillsboro Beach (R25-R26) had a total of 11 loggerhead nests, 7 of which were evaluated for reproductive success. These 7 nests resulted in 791 eggs and 576 hatchlings released for a release success of 72.8% (Table 11).

Relocation

A total of 43 nests were relocated throughout the 2015 nesting-season. Of these 43 nests; 17 were relocated mid-incubation due to nest chamber washout or egg exposure, 8 were relocated because they were laid below the high tide line, the remaining 18 nests were relocated because they were laid in a “Donor” zone as specified by FFWCC.

Nest relocation activities have dropped significantly in Broward County in the last several years, as management practices are moving toward a more “Hands Off” approach. The current management plan is to not utilize extensive relocation efforts into “Hatchery” areas, but instead leave as many nests *in situ* as possible as to minimize the impact of nest relocation, which generally results in a lower nest hatching success.

For all Broward County and all turtle species combined only 1.39% of nests were relocated in the 2015 season compared to over 56% relocation rate in 2005 (Figure 8). Relocation rate has been on a steady decline as management strategies are changing, but 2015 represents the lowest relocation rate to date for the project and is well below the 5-year average of 7.92%.

Incubation Period

Incubation periods were determined for 34 relocated loggerhead nests (14 relocated mid-incubation due to washover/washout). Relocated loggerhead nests had an incubation range from 44 – 59 days with a mean incubation period of 50.21 days. This is very similar to *in situ* loggerhead nests that had a mean incubation period of 49.71 days. Incubation periods were calculated for 5 relocated green nests. Incubation periods ranged from 48 – 52 days with an average of 49.40 days. This is slightly lower than the mean incubation period for *in situ* green turtles of 50.2 days, but this mean is only based on 3 data-points. There were no leatherback nests relocated in 2015.

Reproductive Success

Reproductive success was calculated for 41 relocated nests (36 loggerhead, 5 green). The 36 loggerhead nests resulted in 3,453 eggs with 2,113 hatchlings released for a release success of 52.7%. This is nearly 20% lower than reported for relocated loggerhead nests in 2014 (Burkholder and Slagle, 2014). The 5 green turtle nests resulted in 565 eggs with 335 hatchlings released for a release success of 48.9%.

Hatchling Disorientation Events

The Broward County Sea Turtle Conservation Program surveyors reported 122 (13 adult disorientation events, 109 hatchling disorientation events) nests that experienced disorientation across Broward County that were recorded on morning surveys. A disorientation event is defined as either an adult or hatchling sea turtle that does not orient or travel toward the sea, but instead will travel in a direction that is more than 45 degrees from the beach ocean interface. Most of these events can be tied to an anthropogenic light source that is brighter and therefore may be misleading from what would naturally be the brightest point on the horizon (how the nesting mothers and hatchlings typically orient themselves), which historically would be the moon and stars over the ocean (See Appendix 5 for example Disorientation Report). Sixty-nine of these disoriented nests were in the Pompano Beach Survey zone and an additional 27 disoriented nests were in Fort Lauderdale Survey zone. Together these two survey zones accounted for 79% of the disorientation events reported by BCSTCP staff this season. One hundred and twenty two disorientation events is 33 less than what was documented in the 2014 season but is still very similar to the 5-year Broward County average of 136.8 events (Figure 9). For each disorientation event, a Marine Turtle Hatchling Disorientation Incident Report Form was filed with FFWCC.

To get a better understanding of the number of nests resulting in a disoriented mother or hatchling we examined all disorientation reports submitted by all sea turtle monitoring/volunteer groups (BCSTCP, STOP, Audubon) in Broward County (minus John U Lloyd State Park). The STOP and Audubon groups have coverage over the majority of the County beaches, however their efforts are focused in the areas most impacted by anthropogenic lighting. Any nests that are not documented at night upon hatchout will be assessed in the morning by the BCSTCP staff, providing a relatively comprehensive examination of disorientation events for sea turtle nests. Due to the nature of working on the beach and weather impacts, there is always the possibility that some hatchouts go unnoticed during the morning survey because the tracks are washed away by rain or wind, etc. However we believe this provides a representative assessment of the hatchling disorientation experienced on Broward County beaches. We compared number of nests that experienced hatchling disorientation (these are the nests most documented by the volunteer groups monitoring nests for hatchout at night) across each municipality in Broward County (minus John U Lloyd State Park). Countywide 795 nests were documented as disoriented out of total 2,100 nests where hatchout was noted/documentated for a percent disorientation for all nests of 37.86% (Figure 9b). However some areas experience much higher disorientation rates than others. Lauderdale by the Sea was the municipality that experienced the highest hatching disorientation rate at 66.96% of nests (154 out of 230). Fort Lauderdale, Lauderdale Lakes, Pompano, Deerfield and Hollywood all experienced nearly 50% disorientation rates or higher. Hillsboro had the lowest hatchling disorientation rate with only 37 out of 622 (5.95%) documented hatchouts disorienting (Figure 9b, Table 12).

Predation and Poaching

In 2015, 189 nests (or 6.12%) of all nests in Broward County (not including John U Lloyd) experienced predation (all species, all zones). This is much lower than the 2014 season that had an overall predation rate of 11.72% and is 2.44% lower than the 5-year predation average percentage of 8.56%. Broward County as a whole has shown little change in predation percentages from 2005 – 2015. A slight rise in predation in the 2013 and 2014 seasons was not continued during the 2015 season, but fluctuating numbers suggests we should continue to keep a close eye on predation rates in this area (Figure 10). Fox are the primary culprit in this region, but iguanas, raccoons, ants, night heron, crow, and other unknown bird species were also documenting predating nests. The Hollywood survey zone experienced the lowest predation impact with no predation events. Hillsboro survey zone experienced the highest predation rates at 12.87% of nests experiencing predation (Figure 11), but this is down considerable from over 25% in Hillsboro in 2014. As Hillsboro is the highest nesting density in Broward County this elevated predation impact may warrant some degree of nest protection in future years.

In addition to predation impacts, 16 (0.49%) nests in Broward County were impacted by human disturbance/poaching. This is very similar to what we saw during the 2014 season where 15 nests (0.49%) were impacted. Most impacts were light digging in the nest or nest vandalism, but some experienced heavy digging/trenching within the nest perimeter.

Restraining Cages

In the designated “Caging” zones a total of 50 restraining cages were constructed on loggerhead turtle nests (Six were not excavated due to washout/reestablish): 25 Fort Lauderdale, 25 Hollywood.

Incubation Period

We were able to excavate 44 of the 50 nests that received hatchling-restraining cages. All of these nests were loggerhead nests with the first cage being constructed June 12, 2015 on Fort Lauderdale Beach, the last was constructed September 11, 2015 on Fort Lauderdale Beach and removed September 30, 2015. Incubation period for caged nests ranged from 44 days to 55 days with a mean incubation period of 49.65 days. This is very similar to the wider dataset of *in situ* loggerhead nests, which had incubation periods ranging from 42 - 69 days with a mean incubation period of 49.94 days in 2015.

Reproductive Success

Caged nests were excavated and analyzed for reproductive success. Six of the 50 cages constructed this season could not be analyzed due to washout and/or loss of cage/stakes that required reestablishment (Egg chambers could not be located). A total of 4,316 eggs were deposited in the 44 inventoried cages that were outfitted with hatchling restraining cages with 2,554 “hatchlings released” for a hatching success rate of 54.47% across all inventoried caged nests (Table 6). This hatching success rate is about 10% lower than the

62.66% mean hatchling release of 1,843 loggerhead nests left *In situ* this season. This is a 2% higher hatchling release rate compared to relocated loggerhead nests this season at 52.69%.

Overwash and Washout Events

A total of 802 (602 Overwash, 200 Washout) or 25.97% of all nests throughout Broward County (except John U Lloyd) experienced Overwash/Inundation throughout the season. This is lower than the 2014 season, which had 1,012 (33.21% of nests) nests impacted; this year also was lower than the 5 year average (2010-2014) of 915 nests (Figure 12). Tropical Storm Erika (in conjunction with a high tide event) (August 28 – September 1, 2015), which travelled up the East Coast of the United States, is responsible for the majority of the washover/inundation events in 2015 (427 Overwash/187 Washout). While Erika was quite far offshore when it passed Broward County, the wave action coupled with a period of particularly high tides resulted in heavy beach inundation, especially on Hillsboro/Deerfield Beaches (214 Overash/122 Washout), which have a high density of nests and a very narrow profile for most of its length.

Strandings

The Broward County Sea Turtle Conservation Program Stranding Team responded to 76 marine turtle stranding events from January 1, 2014 to December 21, 2015. Of these 41 were dead stranded turtles (4 of these were picked up alive, but died in transport to a rehabilitation facility) and 35 were live strandings (see Appendix 1a for a full breakdown of stranding response). At each stranding a Sea Turtle Stranding Form was completed and sent to FWC and the Broward County Project Administrator (see Appendix 1b for an example). Stranding numbers were much lower in 2015 than were reported in 2012 and 2013, which experienced nearly 3 times the number of standings than 2015, but still showed an increase over strandings encountered during the 2014 season (see Appendix 1c for a Broward County Stranding history).

A string of juvenile green turtle strandings in April 8-17, 2015 accounted for 22 (17 live, 5 dead, and 1 live that died in transport) of our total strandings. Many of these turtles presented as very lethargic and some were having seizures either at time of pickup, or later in transport or once arriving on site at a treatment center. Similar strandings occurred around South Florida and into the Keys, Florida Fish and Wildlife Conservation Commission are still investigating the cause of this string of strandings at this time.

Of the 76 strandings, 9 were impacted by fishing hooks (8 of these were live strandings and were able to be transported to a rehabilitation facility to remove the hooks and fishing line).

Obstructed Nesting Attempts

Morning surveys documented 504 obstructed nesting attempts (ONA), 350 of these were loggerhead crawls, 151 green turtles, and 3 leatherback crawls. Of the 504 ONAs, 286

resulted in false crawls and 218 resulted in a nest. Turtles encountered a number of obstructions that were documented of these 141 were impacted by beach furniture, 104 by a seawall, 87 by an escarpment, 21 by a rock outcropping, 17 by cabanas, 13 by rock revetment, 2 by an umbrella, 9 by boat, and 164 by miscellaneous (fence, garbage can, construction wall, lifeguard stand, post, stairs, etc).

DISCUSSION

Yearly Nesting Trends and Nesting Success

The 2015 nesting season had the second highest nest count in project history only falling slightly behind the record 2012 nesting season. All three species of nesting turtles in Broward County have shown a significant increase in nest deposition over the history of the Broward County Sea Turtle Conservation Program starting in 1981. Loggerheads are on an increasing trend of +30.5 nests per year since 1981 (Figure 7). However, there was a 10-year period of decline from 1997 – 2007. Since 2007 we have seen an increase in loggerhead nesting activity rising at a much higher rate than the overall project trend. Green turtles have also seen a positive historic trend in nesting in Broward County. The 2015 season was record breaking in many areas of Florida, however came in slightly behind the Broward County record green turtle season in 2013, but was still the second highest green turtle nesting on record for the survey area. Leatherback nesting is also on an increasing historical trend and this year has followed the general up/down-nesting pattern that has been in place for the last 10 years. Burkholder and Slagle (2014) suggested that the 2015 season might be a low nesting year for leatherbacks based on the high nesting in 2013. However while the leatherback nest numbers were down, it was only 4 nests lower than 2014 and some small leatherback crawls suggest there may be new nesting mothers in the population and suggests that the 2016 season will likely be a record breaking leatherback nesting year for Broward County and will continue on the overall upward nesting trend.

The 2015 season showed a greatly reduced nesting and hatching success especially for loggerhead turtles. South Florida and the Ft Lauderdale area in particular experienced a period of extremely hot, dry weather that led to extreme drought conditions. The beach, experienced extremely hot/dry conditions making nesting for sea turtles particularly difficult. Ft Lauderdale documented its 3rd driest summer on record with less than 10 inches of rain (June-August) (National Weather Service Forecast Office). The hot/dry conditions left the sand very dry resulting in increased numbers of sea turtle false crawls and abandoned egg chambers. As a mother tried to dig a nest, the dry sand would continuously cave in on itself in many cases resulting in the mother not laying a nest.

Additionally the extreme temperatures impacted the hatching success of many nests. As temperatures increased the eggs near the top of the clutch (nearest the surface) did not hatch, likely because they passed the thermal tolerance for incubation. Our excavations confirmed this as we would encounter large numbers of un-hatched eggs near the top of

the clutch and then would find the hatched eggs near the bottom likely where the temperatures would be a little cooler.

Seasonal Nesting Patterns

The seasonal nesting pattern is consistent to what is normally found in Broward County with the first nesters to arrive being the leatherbacks, followed by loggerheads and followed up by green turtles. The first leatherback nest was deposited 2 days later than the 2014 season. The first loggerhead nest was deposited nearly a week earlier on April 16, 2015 rather than April 22 during the 2014 season. Green nesting started nearly 2 weeks earlier on May 17, 2015 rather than May 28 in the 2014 season. We had a very active green turtle season this year and the green nesting ended 4 weeks later this year than 2014 with the last green nest deposited on October 10, 2015, rather than September 9 in 2014. Nest deposition follows a nice bell curve with the height of the season falling in June/July for loggerheads, which is similar to historic nesting patterns.

Countywide Nest Distribution

Nest distributions this season closely resemble patterns that have been seen in Broward County for many years with the highest nesting in Hillsboro/Deerfield Beaches, followed by Ft Lauderdale Beaches, then Pompano Beaches, John U Lloyd State Park and the lowest nesting activity on Hollywood Beach. In addition we see very little crawl/nest activity directly adjacent to most jetties and inlets. These types of “beach armoring” constructions disrupt the natural water flow and many times result in increased beach erosion near the structures and impact sea turtle nesting (Mosier and Witherington, 2000; Rizkalla and Savage, 2011).

Hillsboro beach has some of the lowest human population density and lighting of any of the Broward County beaches. This makes for a very suitable nesting environment for sea turtles in this area and may be one reason we see increased nesting activity in this area. However the historic operation of a sea turtle “hatchery” facility at the Hillsboro Beach Club that was maintained through the 2005 nesting season may also play some role in the heavy utilization of Hillsboro and the underutilization of Hollywood beaches for sea turtle nesting. Hollywood is one of the brightest beach stretches in Broward County and because of this was a long time “Donor” zone where nests would be removed and placed in hatchery facilities. Female sea turtles return to their natal beaches when they are ready to deposit nests of their own (Lohmann, et al. 1997). We may be seeing some impact of this long-term movement of nests into the Hillsboro Beach area and may be a question that warrants further investigation in the future.

Nest Relocation

Historically sea turtle hatcheries were used quite extensively in Broward County as a management tool to protect marine turtles. An active hatchery facility was maintained near the Hillsboro Beach Club until 2005 (Burney and Ouellette, 2005). Hatchery facilities provide a sound management tool in heavily impacted coastal communities

where nests left to their own devices will likely experience very high rates of disorientation, predation, washout, etc. However the hatchery model is not without its complications as well. The sex of marine turtle hatchlings is dependent on sand temperature during incubation (Standora and Spotila, 1985). A beach with all nests left *in situ* will experience a range of temperatures, where some nests are laid closer or farther away from the water, or may experience more or less shading from dune vegetation, etc; likewise, different nest chamber depths will likely experience different temperatures during development. When all or most of a beach's nests are relocated into a hatchery facility, this may eliminate some of the natural temperature variation found when nests are left *in situ*. Also when nests are packed densely together as in a hatchery facility they become more vulnerable as a whole to disease and disease transmission, predation (though predation can be dealt with at some level with fencing/protection), storm events (less buffering by having nests widely distributed as would be found when left *in situ*). In 2004, Hurricane Frances and Hurricane Jeanne had significant negative impacts on the hatchery nest facilities (Burney and Ouellette, 2004).

Relocations generally experience lower hatching success than *in situ* nests because even though eggs are handled with the utmost care, they are still being moved and placed into an artificial chamber that is likely not as good as what the mother can build. In a hatchery system, some nests may travel a long distance in buckets before they are placed in their new handmade nests. The final year of the hatchery facilities loggerhead nests had a Release Success (live hatchlings released/total eggs) was 53.3% for relocated nests (N = 1151 nests or 56.04% of all nests in 2005) (Burney and Ouellette, 2005). Our relocated Release Success in the 2015 season was similar to the 2005 season at 52.2% (N = 43 nests or 1.39% of all nests in 2015). However release success was greatly reduced for all nests this season likely due to the hot, dry weather experienced early in the season. As lighting compliance improves in Broward County, we recommend continuing the more "Hands Off" management strategy. Data in the coming years will help determine the most effecting suite of management tools for the dynamic and highly utilized beaches of Broward County.

Restraining Cages

We found hatchling-restraining cages to be an effective short-term mitigation action in areas of bright anthropogenic beachfront lighting to minimize loss and death of sea turtle hatchlings that would likely disorient in these areas. The cages also provided an effective educational tool in the field with signage and allowing our team to speak to beachgoers about sea turtle friendly lighting and why these measures were being used in certain areas. While effective as a temporary mitigation action, hatchling-restraining cages are extremely time and labor intensive for program staff to ensure hatchlings are never restrained for too long. As a long-term management tool we highly recommend continuing to work to rectify the underlying lighting issues at the light source in these areas rather than using restraining cages as a long-term management solution in these areas.

Disorientation Reports

Disorientation reports provide a mechanism to document nests that experience significant hatchling disorientation. In Broward County we have 3 organizations documenting these events. With multiple groups recording disorientation events, it makes it difficult to ensure standardized methodology county wide that would be beneficial to make disorientation reporting most effective as a management tool. However we were able to use all Disorientation reports filed in Broward County this year to provide a more succinct and complete look at the impact of coastal lighting on especially our hatchling sea turtle populations. These disorientation reports paired with monthly lighting reports show a correlation between sea turtle nesting activities and anthropogenic lighting. The results are being used to target future outreach efforts.

Challenges Encountered

The Atlantic hurricane season was quite benign this year, however Tropical Storm Erika impacted Broward County on August 28 – September 1, 2015. The storm travelled far offshore, however storm surge and wave action coupled with a particularly high tide (King Tide August 29 – September 2) event caused extensive washover and washout events across Broward County, especially in Hillsboro Beach, which has a very narrow beach profile resulting in many nests being washed out or needing to be reestablished. We were lucky that the storm hit late in the season and most 2015 nests had already hatched and were off the beach. County wide (except John U Lloyd) Erika accounted for 187 (out of 200 total for the season) washed out nests and about 2/3 of the washover events (427 out of 602 County wide for the 2015 season), though nests can be impacted on multiple days, so nests washed over as part of the storm event, may have also experienced washover events at other points during the season. Even with extensive preparation for the storm event securing stakes, replacing markers/tape etc, 34 nests still needed to be reestablished after the storm impacts receded due to loss of nest markers. Likewise, several nests outfitted with hatchling restraining cages were impacted and cages had to be reestablished after waters receded.

In addition a period of especially high tides (King Tide events) on Sept 26-Oct 2, was cause for worry for nest overwash, inundation, and washout. However preparatory activities (re-securing stakes, removing restraining cages in areas of high washover probability, etc) helped mitigate the impact. While it did not help nests to escape overwash, the preparations did remove the need for any reestablishment due to lost stakes.

We also experienced some degree of vandalism throughout the season that impacted our abilities to conduct post-hatching assessments in some cases. We had a few cases where nest markers were moved/removed making egg chamber location very difficult.

Conclusions and Recommendations

Management of nesting endangered sea turtles in Florida is a monumental task. We feel that the current “hands-off” approach being used by FFWCC leaving as many nests in place as possible is working very well to provide the highest overall success for the beaches in Broward County. Hopefully as nest numbers continue to rise in this area, this approach will be even more effective and provide less overall impact on our nesting female and hatchling populations.

The restraining cages currently being used in some zones in Broward County provide a good short-term management strategy for addressing areas of high concern in regards to artificial (non-sea turtle friendly) lighting and light fixtures. These areas experience high rates of hatchling disorientation and the cages help mitigate the negative impacts by allowing sea turtle professionals to ensure the hatchlings are able to safely enter the water; however we do not feel that this is a feasible long-term solution to these issues. Continued efforts working with code enforcement in each municipality to generate targeted education and enforcement efforts in regards to sea turtle friendly lighting should be of the utmost priority.

The extreme tide and weather events (storm, drought) that we experienced during this season may have resulted in a slightly lower overall productivity for the 2015 nesting season however the high rate of nesting activity in this area and across Florida for 2015 suggests that the sea turtle populations are continuing their overall positive trend and leaving us cautiously optimistic as to the status of our nesting turtle populations in Broward County.

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TABLES & FIGURES

Table 1: Summary of the sea turtle nesting beach 2015 survey zones in Broward County, Florida, USA.

Broward County Survey Areas			
BEACH	BEACH LENGTH (miles)	BOUNDARIES	FDEP SURVEY MARKER #
Hillsboro-Deerfield Beach	4.3	Palm Beach Co. line to Hillsboro Inlet	R1-24
Pompano Beach Including Lauderdale-by- the-Sea	4.8	Hillsboro Inlet to Commercial Blvd.	R25-50
Fort Lauderdale	6.6	Commercial Blvd. to Port Everglades Inlet	R51-85
John U. Lloyd Park	2.4	Port Everglades Inlet to Dania Beach fence	R86-96
Hollywood-Hallandale Including Dania	5.8	Dania Beach fence to Miami Dade Co. line	R97-128

Table 2: Summary of treatment zones by R-Monument for 2015 sea turtle nesting season, Broward County, Florida.

Zone	In Situ Only	In Situ & Recipient	Restraining Cage	Donor
Description	All nests left in situ; nests from "Donor" zones may not be relocated in these zones; restraining cages may be used with approval by FWC ** No restraining cages will be used in these zones	All nests left in situ; nests from "Donor" zones may be relocated to this area. Cages should not be used.	All nests left in situ; fit a restraining cage to every other nest	All nests relocated from this area to nearest "Recipient" zones.
R-Monument	R1-R6 R25-R26 R34-R39 R50-R51 R53-R58 R64-R74 **R75-R77 R78-R80 R84-R84.7 R97.5-R102 **R107-R124	R6-R24 R26-R34 R39-R50 R51-R53 R58-R64 R80-R84 R102-R107 R124-R128	R74-R78 R107-R124	R24 - Hillsboro Inlet R85 - Port Everglades

Table 3: Total nests and nesting densities (Nests per mile) by Species and Survey Zone in 2015

Beach	Loggerhead			Green			Leatherback		
	<i>Total Nests</i>	<i>Beach Length</i>	<i>Nests per mile</i>	<i>Total Nests</i>	<i>Beach Length</i>	<i>Nests per mile</i>	<i>Total Nests</i>	<i>Beach Length</i>	<i>Nests per mile</i>
Ft Lauderdale	945	6.6	143.18	100	6.6	15.15	6	6.6	0.91
Pompano	557	4.8	116.04	23	4.8	4.79	13	4.8	2.71
Hillsboro	949	4.3	220.70	321	4.3	74.65	12	4.3	2.79
Hollywood	151	5.8	26.03	7	5.8	1.21	3	5.8	0.52
John U Lloyd	139	2.4	57.92	12	2.4	5.00	1	2.4	0.42
OVERALL	2741	23.9	114.69	463	23.9	19.37	35	23.9	1.46

Table 4: Total nests, False Crawls (FC) and Nesting Success (NS) by Species and Survey Zone in 2015

Beach	Loggerhead			Green			Leatherback		
	<i>Nests</i>	<i>FC</i>	<i>NS</i>	<i>Nests</i>	<i>FC</i>	<i>NS</i>	<i>Nests</i>	<i>FC</i>	<i>NS</i>
Ft Lauderdale	945	1262	42.82%	100	133	42.92%	6	0	100.00%
Pompano	557	765	42.13%	23	26	46.94%	13	0	100.00%
Hillsboro	949	1437	39.77%	321	245	56.71%	12	1	92.31%
Hollywood	151	246	38.04%	7	12	36.84%	3	0	100.00%
John U Lloyd	139	426	24.60%	12	29	29.27%	1	0	100.00%
OVERALL	2741	4136	39.86%	463	445	50.99%	35	1	97.22%

Table 5: Breakdown of nest treatment (*In situ*, Relocate, Restraining Cage) by beach and species with overall totals.

	Loggerhead	Green	Leatherback	Unknown	Total
<i>In situ</i>					
Ft Lauderdale	902	95	6	1	1004
Pompano	547	23	13	0	583
Hillsboro	940	320	12	0	1272
Hollywood	126	7	3	0	136
OVERALL	2515	445	34	1	2995
Relocated					
Ft Lauderdale	18	5	0	0	23
Pompano	10	0	0	0	10
Hillsboro	9	1	0	0	10
Hollywood	0	0	0	0	0
OVERALL	37	6	0	0	43
Caged					
Ft Lauderdale	25	0	0	0	25
Pompano	0	0	0	0	0
Hillsboro	0	0	0	0	0
Hollywood	25	0	0	0	25
OVERALL	50	0	0	0	50

Table 6: Total egg counts, released hatchlings, and overall release successes for *in situ*, relocated, and caged nests of loggerheads, greens, and leatherbacks in 2014, with numbers of unevaluated nests.

Species	# Eggs	# Evaluated Nests	Hatchlings Released	Emergence Success %	Unevaluated Nests
In situ					
Loggerhead	185157	1807	120706	63.1	1807
Green	29578	253	22437	73.2	253
Leatherback	2453	27	1403	51.5	27
Total	217188	2087	144546	64.1	2087
Relocated					
Loggerhead	3453	36	2113	52.7	36
Green	586	5	335	48.9	5
Total	4039	41	2448	52.2	41
Restraining Cage					
Loggerhead	4316	44	2554	54.5	6
Total	4316	44	2554	54.5	6
Overall					
Loggerhead	192926	1887	125373	62.7	1849
Green	30164	258	22772	72.7	258
Leatherback	2453	27	1403	51.5	27
Total	225543	2172	149548	63.7	2134

Table 7: Accounting of the status of all hatched and unhatched eggs in evaluated *In situ*, Relocated, and Caged Loggerhead nests for 2015.

Location	Total Eggs	# Eval Nests	Emerged (%)	LIN (%)	DIN (%)	Live PIP (%)	Dead PIP (%)	VD (%)	NVD (%)
<i>In situ</i> Nests									
Hillsboro Beach	51183	514	56.0	2.8	1.9	0.2	6.5	22.7	12.8
Pompano Beach	45861	424	68.7	2.6	2.0	0.3	5.2	12.8	8.9
Ft Lauderdale Beach	77279	750	64.5	3.3	2.9	0.3	5.8	14.4	9.5
Hollywood Beach	10834	119	65.3	3.6	2.9	0.6	5.6	13.4	10.7
Overall <i>In situ</i>	185157	1807	63.1	3.0	2.4	0.3	5.8	16.2	10.3
Relocated Nests									
Hillsboro Beach	775	8	30.9	4.6	1.4	0.5	3.4	25.8	24.3
Pompano Beach	1010	10	62.8	7.2	2.7	0.5	2.8	10.9	10.4
Ft Lauderdale Beach	1668	18	56.8	5.5	1.8	3.5	17.6	8.4	6.2
Overall Relocated	3453	36	52.7	5.8	2.0	1.9	10.0	13.0	11.5
Caged Nests									
Ft Lauderdale Beach	2176	22	52.8	4.9	1.7	0.9	7.4	17.8	13.6
Hollywood Beach	2140	22	56.2	2.8	1.4	0.1	6.5	16.4	16.8
Overall Caged	4316	44	54.5	3.8	1.6	0.5	7.0	17.1	15.2

Table 8: Accounting of the status of all hatched and unhatched eggs in evaluated *In situ* and Relocated Green nests for 2015.

Location	Total Eggs #	Eval Nests	Emerged (%)	LIN (%)	DIN (%)	Live PIP (%)	Dead PIP (%)	VD (%)	NVD (%)
<i>In situ</i> Nests									
Hillsboro Beach	18551	161	69.2	2.8	0.9	0.4	6.4	15.3	5.6
Pompano Beach	2490	21	80.4	1.1	0.3	0.1	1.7	7.6	10.0
Ft Lauderdale Beach	8105	68	80.8	2.4	0.8	0.2	2.7	6.3	5.6
Hollywood Beach	432	3	60.9	0.7	1.6	0.0	10.2	10.2	16.2
Overall <i>In situ</i>	29578	253	73.2	2.5	0.8	0.3	5.1	12.1	6.1
Relocated Nests									
Ft Lauderdale Beach	565	5	48.9	6.5	4.8	4.1	7.6	16.1	12.4
Overall Relocated	565	5	48.9	6.5	4.8	4.1	7.6	16.1	12.4

Table 9: Accounting of the status of all hatched and unhatched eggs in evaluated *In situ* and Relocated Leatherback nests for 2015.

Location	Total Eggs #	Eval Nests	Emerged (%)	LIN (%)	DIN (%)	Live PIP (%)	Dead PIP (%)	VD (%)	NVD (%)
<i>In situ</i> Nests									
Hillsboro Beach	799	9	41.1	1.6	4.8	0.1	10.4	24.8	17.4
Pompano Beach	1129	12	47.2	5.3	4.8	1.4	9.0	15.7	13.5
Ft Lauderdale Beach	360	4	75.3	2.8	3.1	0.0	9.7	5.0	5.8
Hollywood Beach	165	2	76.3	3.6	1.2	0.0	0.6	8.5	3.0
Overall <i>In situ</i>	2453	27	51.5	3.6	4.3	0.7	9.0	16.6	12.9
Relocated Nests									
Ft Lauderdale Beach	158	2	47.6	5.7	0.0	0.0	5.1	1.9	46.2
Overall Relocated	158	2	47.6	5.7	0.0	0.0	5.1	1.9	46.2

Table 10: Nesting success of loggerhead, green and leatherback turtles in relation to County sponsored beach renourishment projects.

Project/Year Sand Placed	Loggerhead			Green			Leatherback		
	Nests	FC	NS	Nests	FC	NS	Nests	FC	NS
Deerfield (2011)	34	64	34.69%	7	6	53.85%	0	0	NA
Hillsboro Inlet Bypass	11	26	29.73%	0	0	NA	0	0	NA
FCCE (2013)	536	715	42.85%	23	26	46.94%	13	0	100.00%
Segment II (Pre Sand)	625	692	47.46%	71	82	46.41%	4	0	100.00%
OVERALL	1206	1497	44.62%	101	114	46.98%	17	0	100.00%

Table 11: Reproductive success of loggerhead, green and leatherback turtles in relation to beach renourishment projects.

Project	# Eggs	# Eval Nests	Hatchlings Released	Release Success %	Uneval Nests
Deerfield					
Loggerhead	2470	25	2017	81.7	9
Green	554	6	499	90.1	1
Hillsboro Inlet					
Loggerhead	791	7	576	72.8	4
FCCE					
Loggerhead	45272	419	32181	71.1	117
Green	2490	21	2002	80.4	2
Leatherback	1129	12	644	57.0	1
Segment II					
Loggerhead	51244	483	37292	72.8	142
Green	6530	54	5667	86.8	17
Leatherback	333	4	241	72.4	0

Table 12: All Disorientation Reports by Municipality; as Reported by BCSTCP, Sea Turtle Oversight Protection (S.T.O.P), and South Florida National Audubon Sea Turtle Program

	HATCH DIS	HATCH TOTAL	% HATCH DIS
Hallandale	1	16	6.25%
Hollywood	44	88	50.00%
Dania	1	15	6.67%
Fort Lauderdale	399	805	49.57%
Lauderdale by the Sea	154	230	66.96%
Sea Ranch Lakes	6	11	54.55%
Pompano	129	260	49.62%
Hillsboro	37	622	5.95%
Deerfield	24	53	45.28%

Figure 1A-F: Location of Broward County and 2014 Survey Zones

Figure 1A: 2015 Survey Zones



Figure 1B: 2015 Survey Zones



Figure 1C: 2015 Survey Zones



Figure 1E: 2015 Survey Zones



Figure 1F: 2015 Survey Zones



Figure 2A-R: Location of 2015 Treatment Zones: Red dots = Loggerhead nests, Green dots = Green nests, Blue dots = Leatherback nests.

Figure 2A: 2015 Treatment Zones



Figure 2B: 2015 Treatment Zones

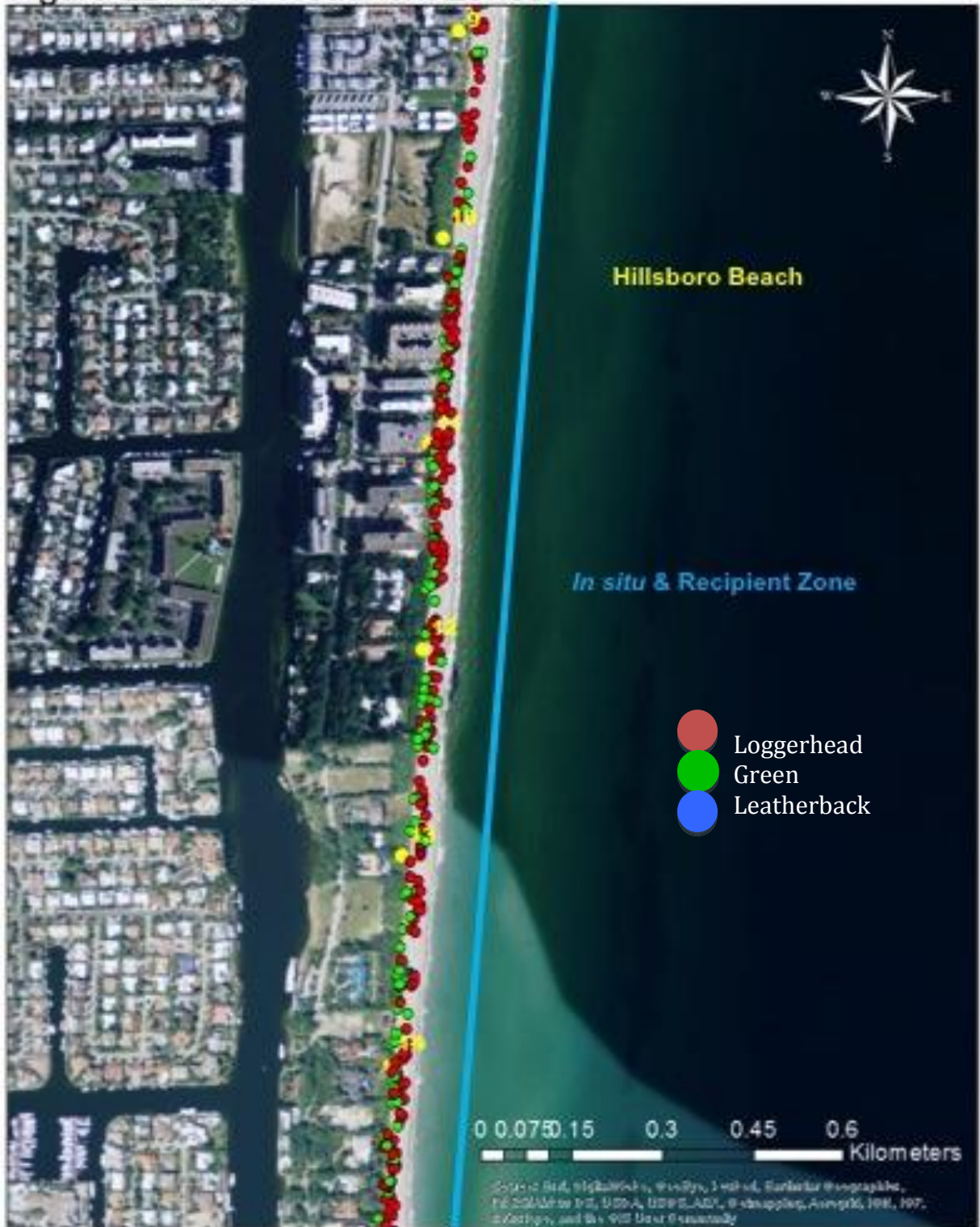


Figure 2E: 2015 Treatment Zones

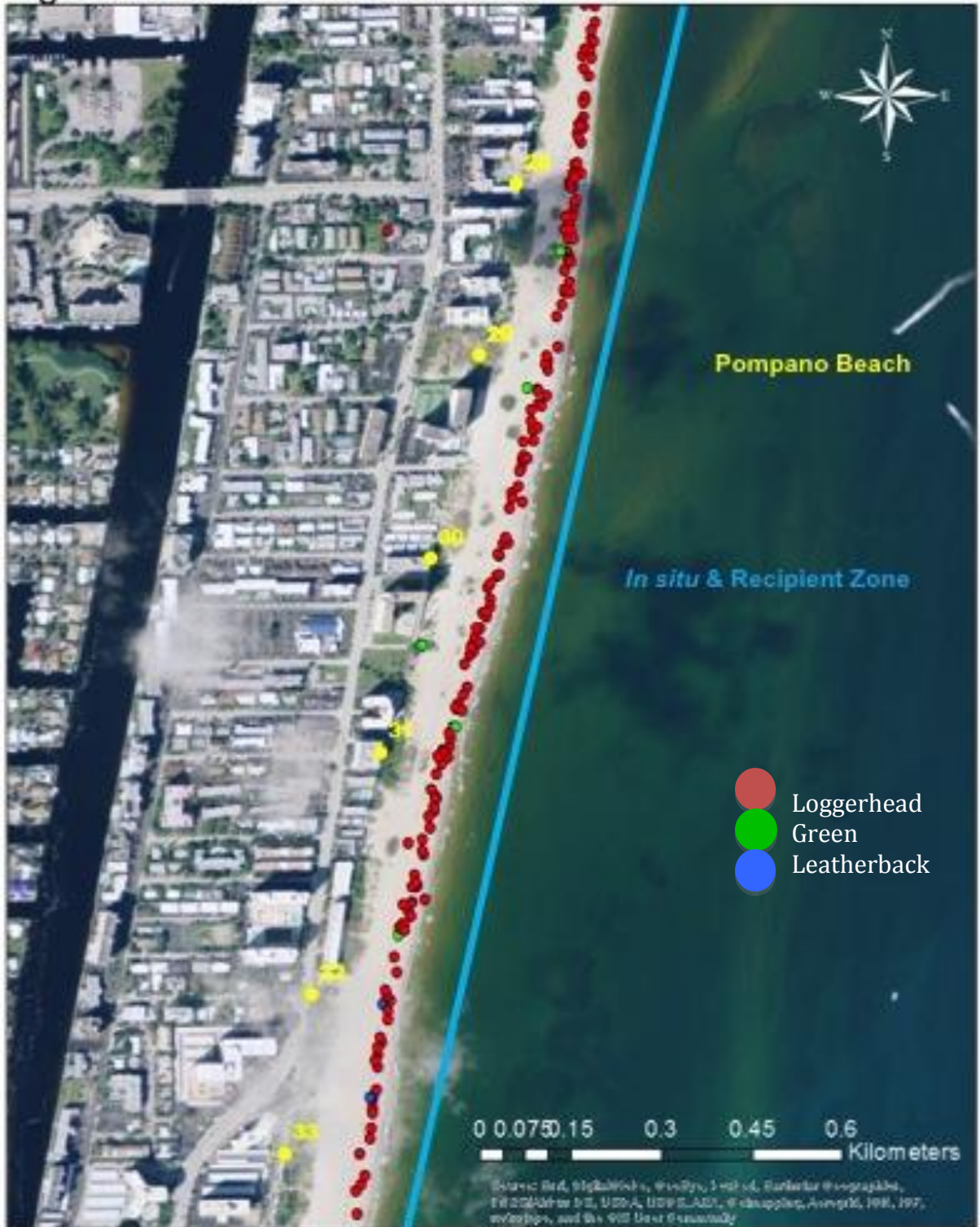


Figure 2F: 2015 Treatment Zones

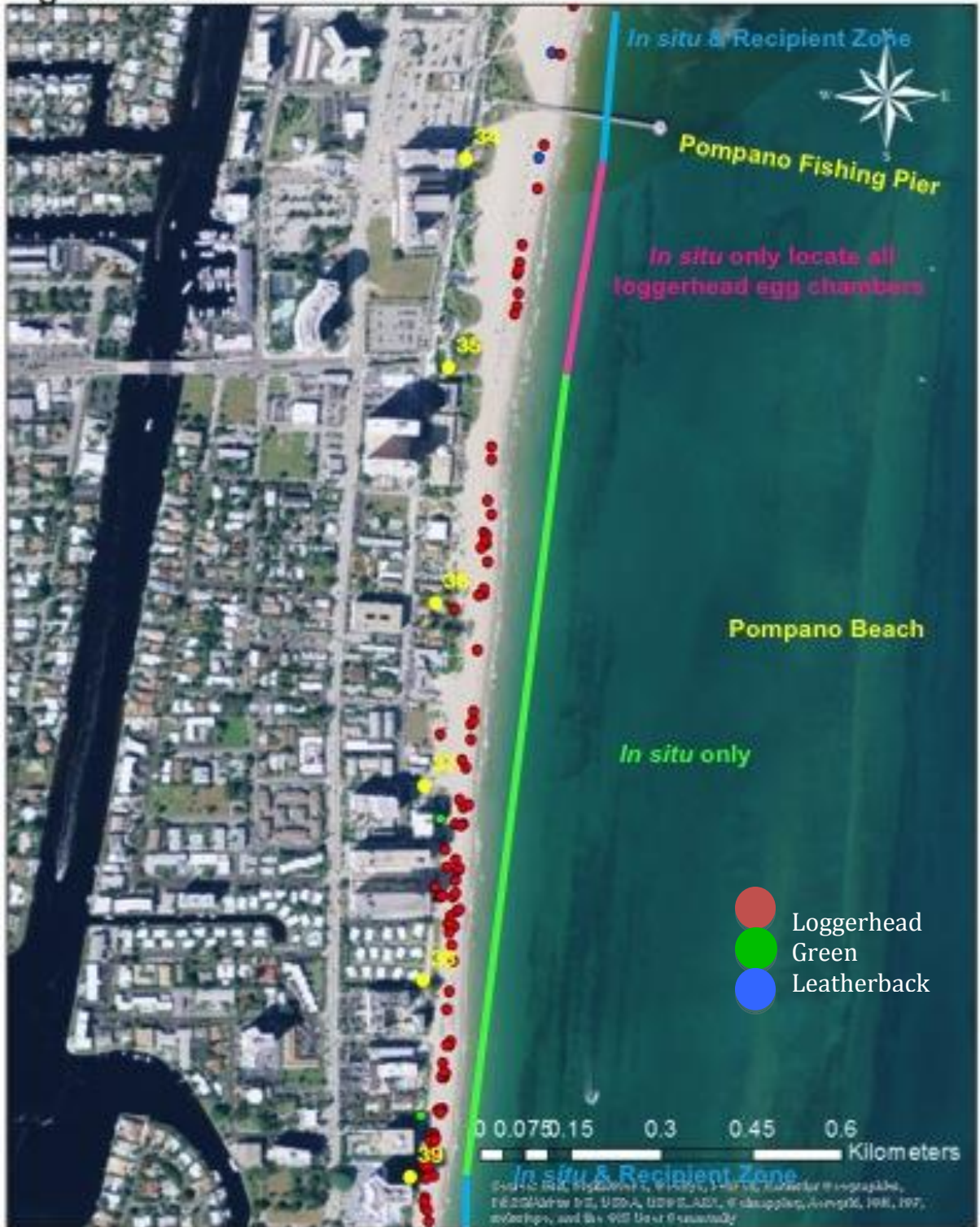


Figure 2G: 2015 Treatment Zones



Figure 2J: 2015 Treatment Zones

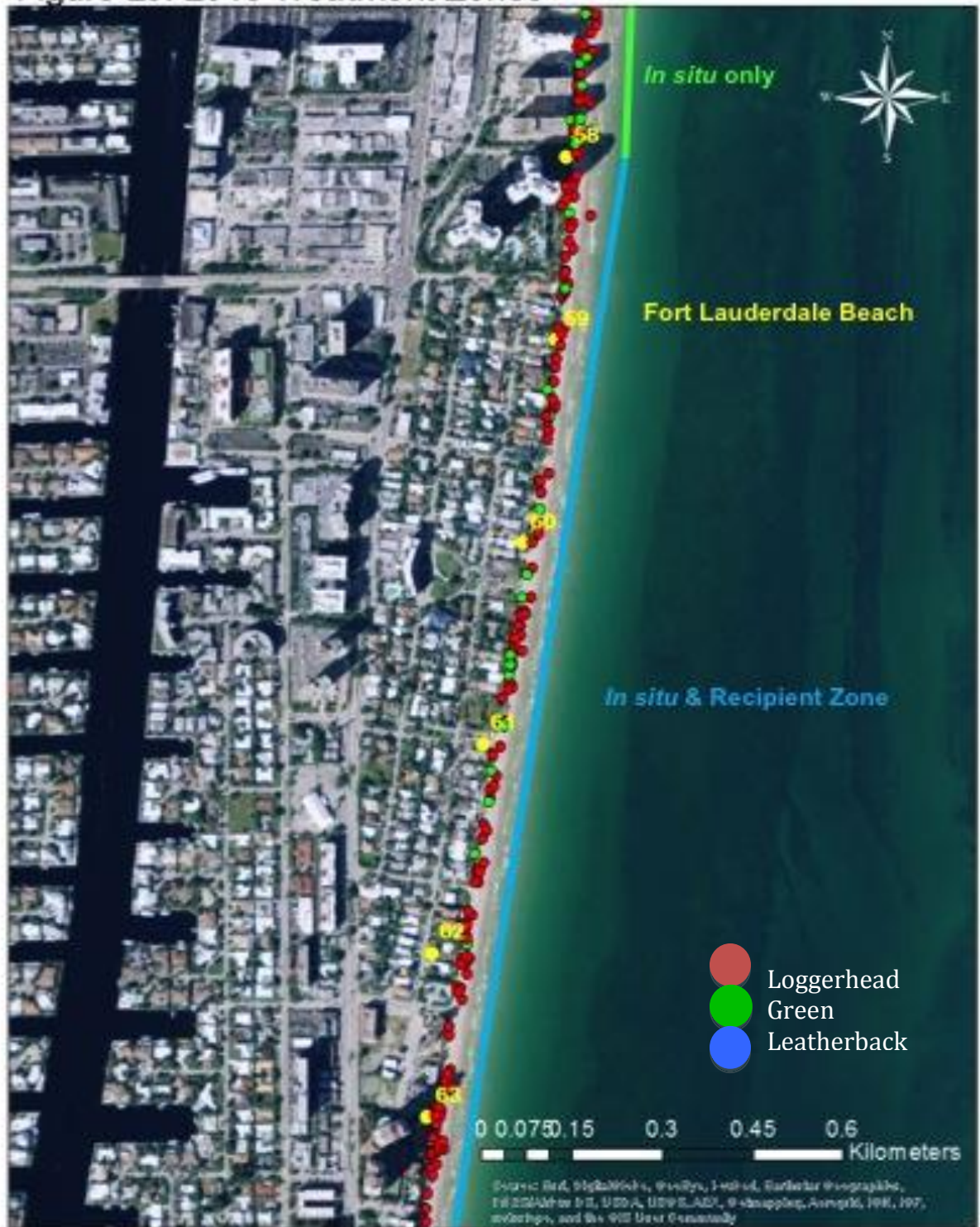


Figure 2L: 2015 Treatment Zones

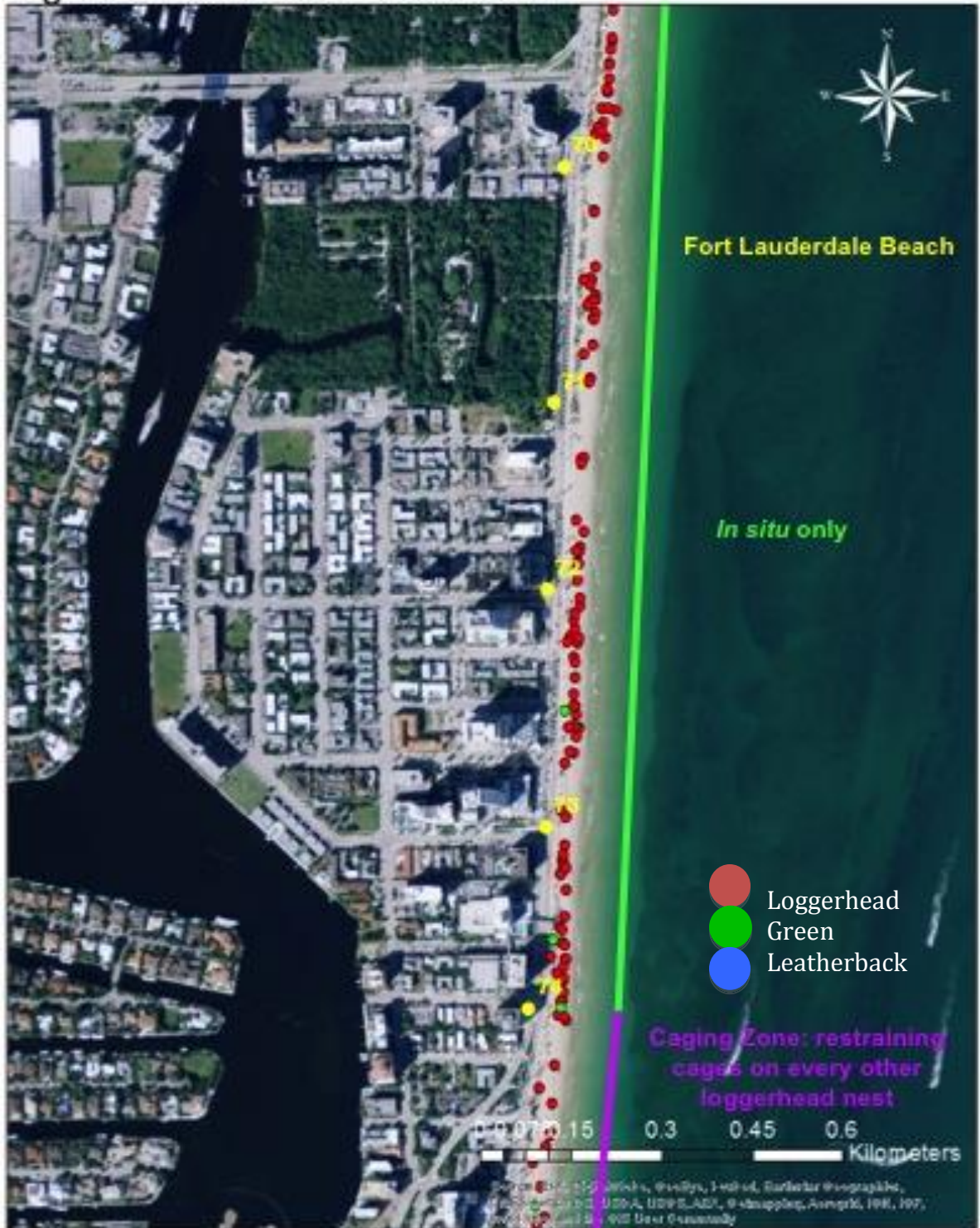


Figure 2M: 2015 Treatment Zones

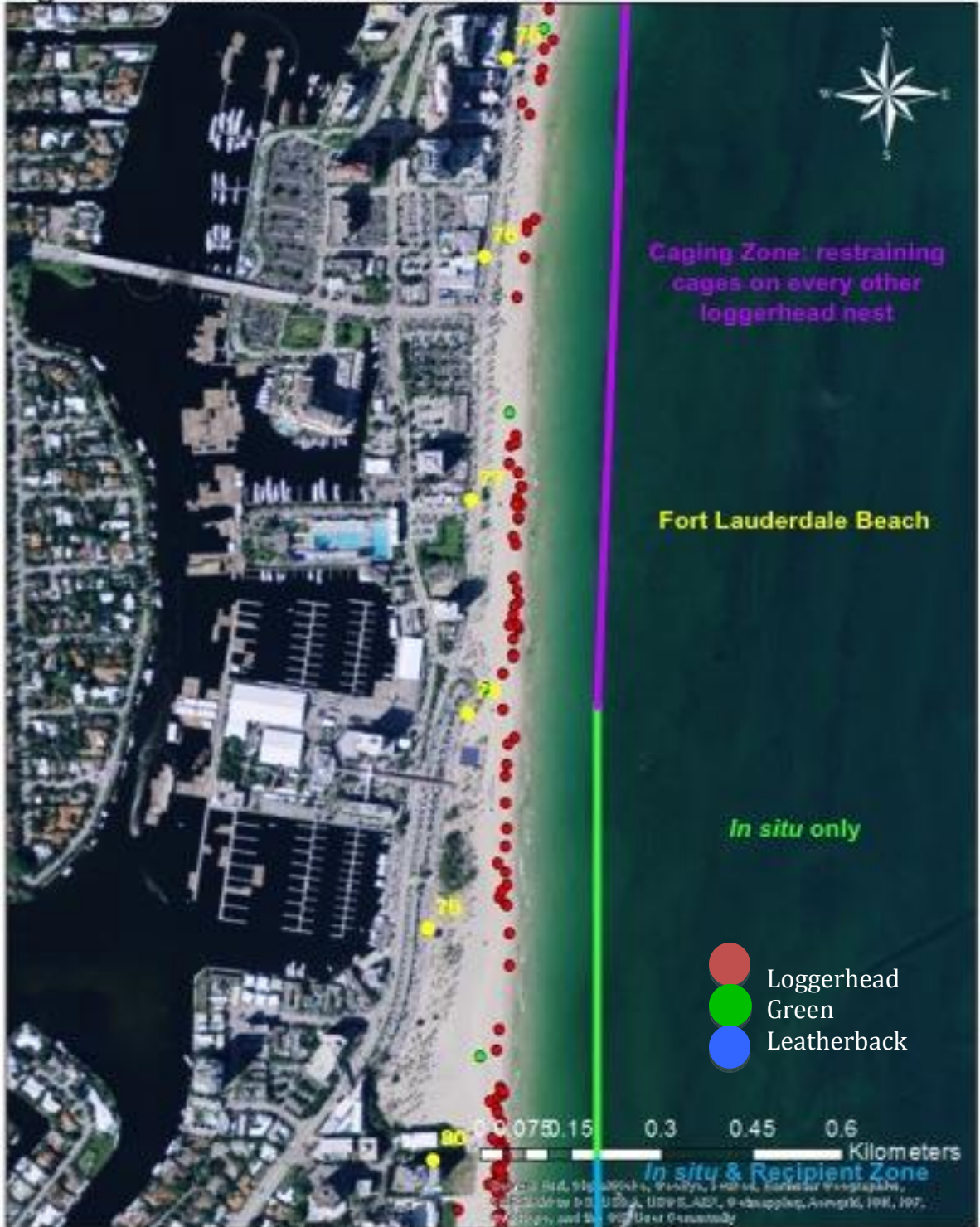


Figure 2N: 2015 Treatment Zones



Figure 20: 2015 Treatment Zones



Figure 2P: 2015 Treatment Zones



Figure 2Q: 2015 Treatment Zones

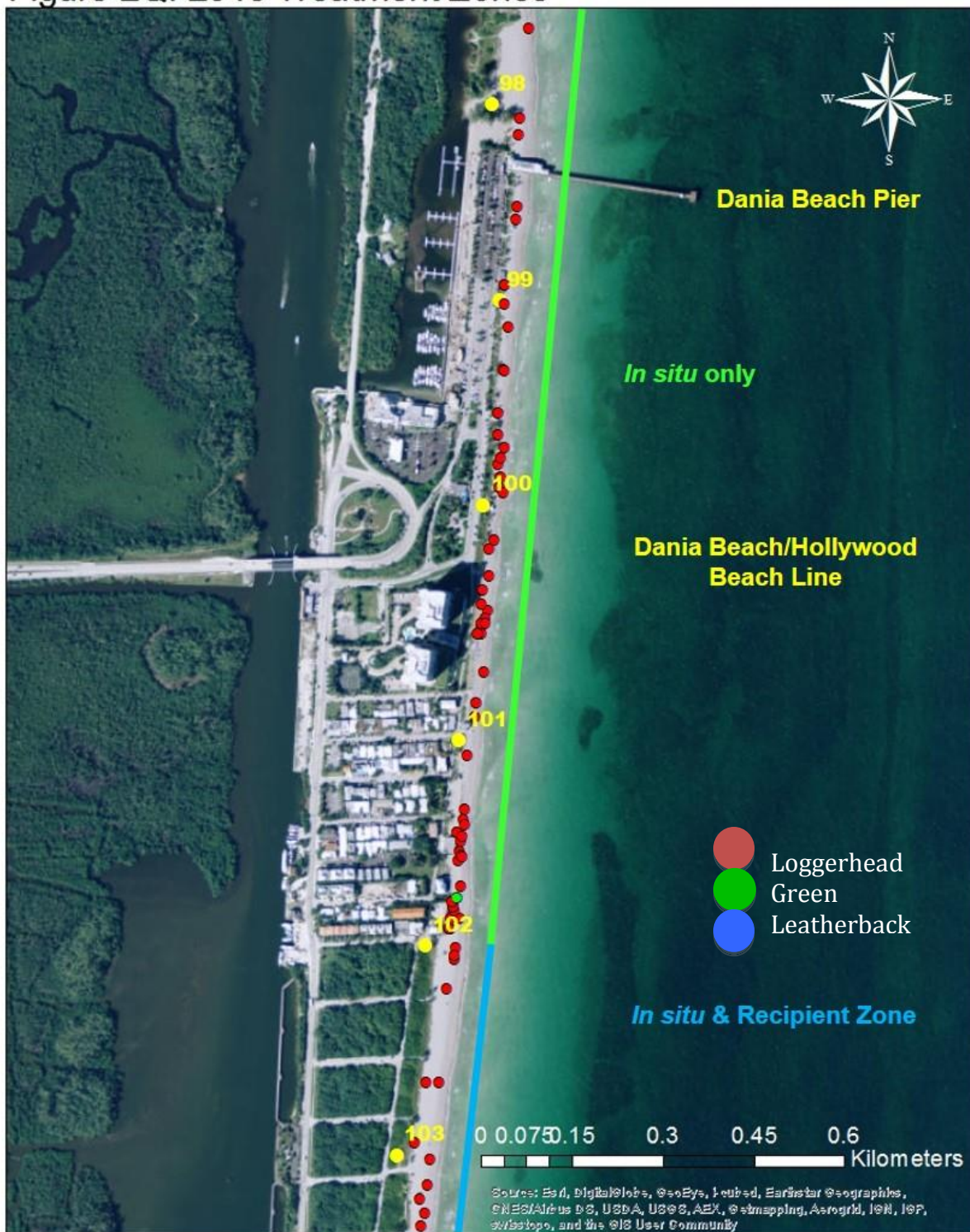


Figure 2R: 2015 Treatment Zones

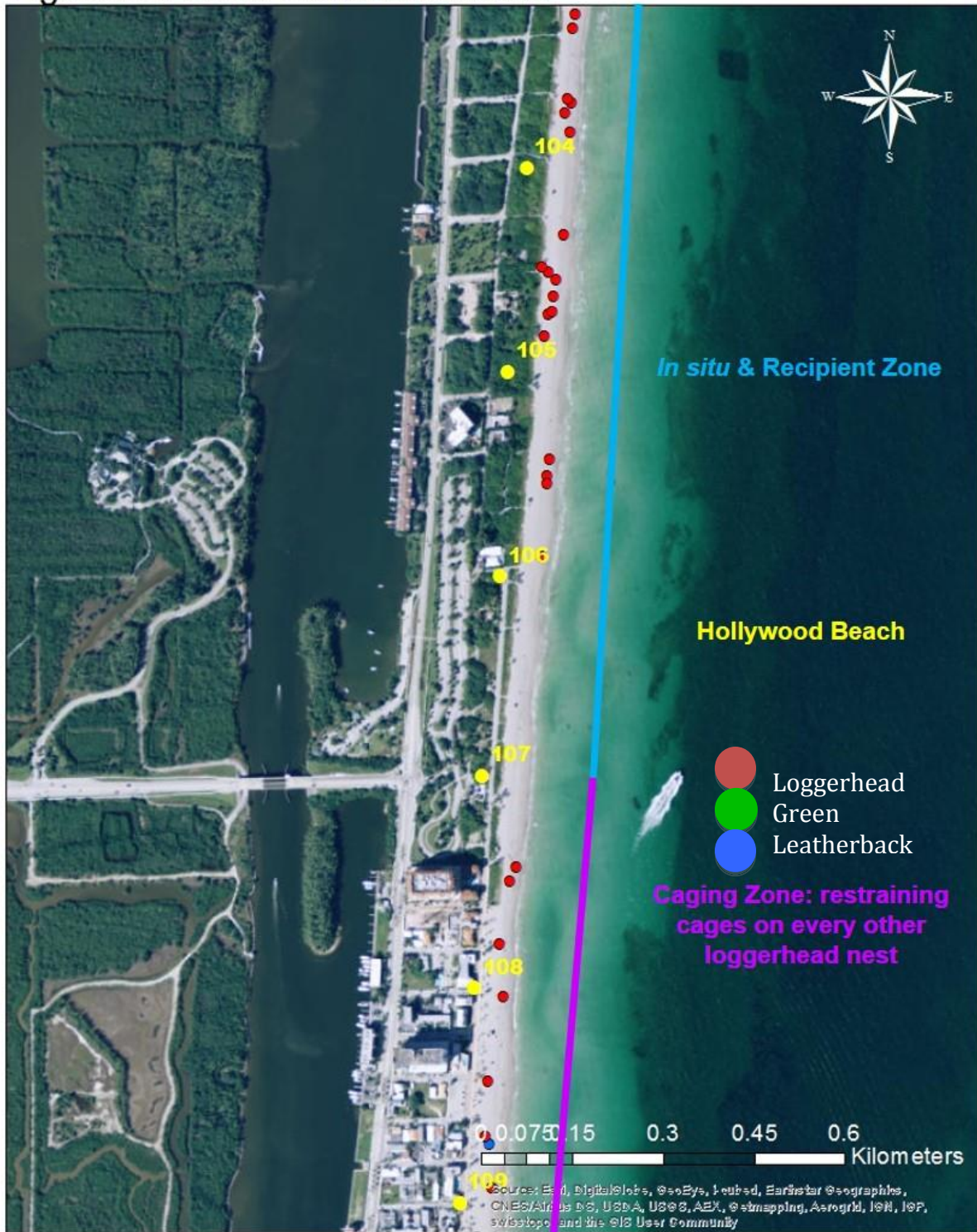


Figure 2S: 2015 Treatment Zones

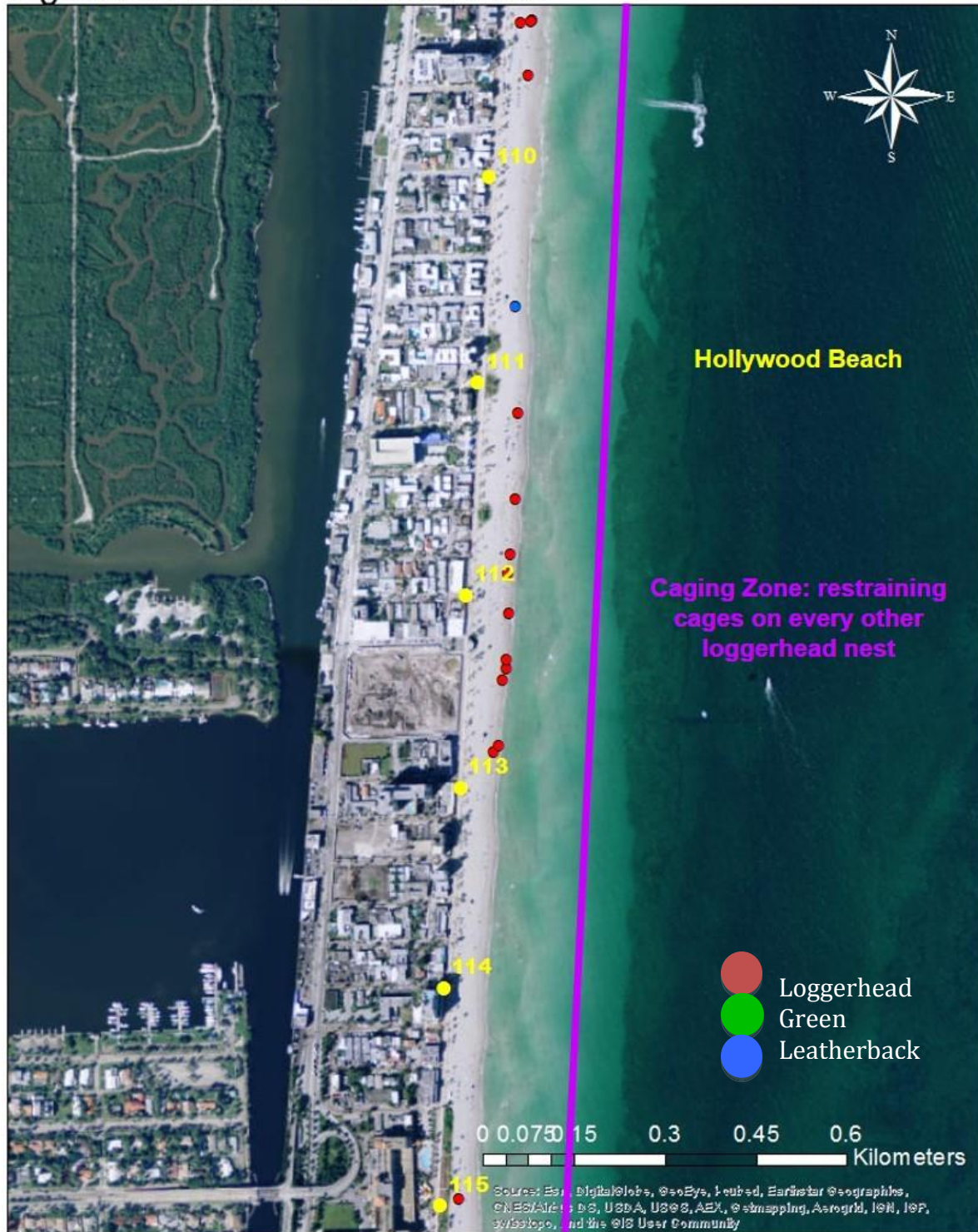


Figure 2T: 2015 Treatment Zones

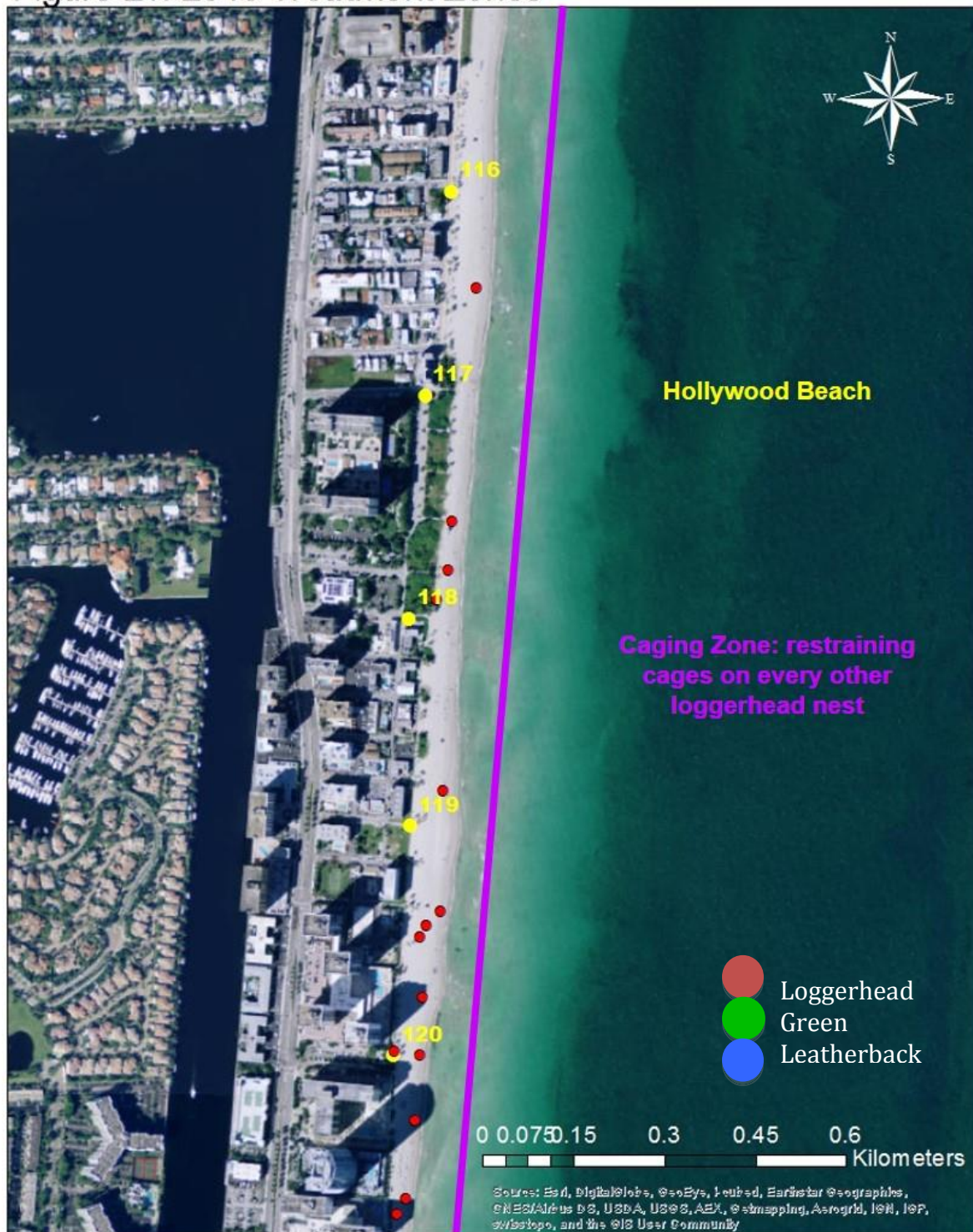


Figure 2U: 2015 Treatment Zones

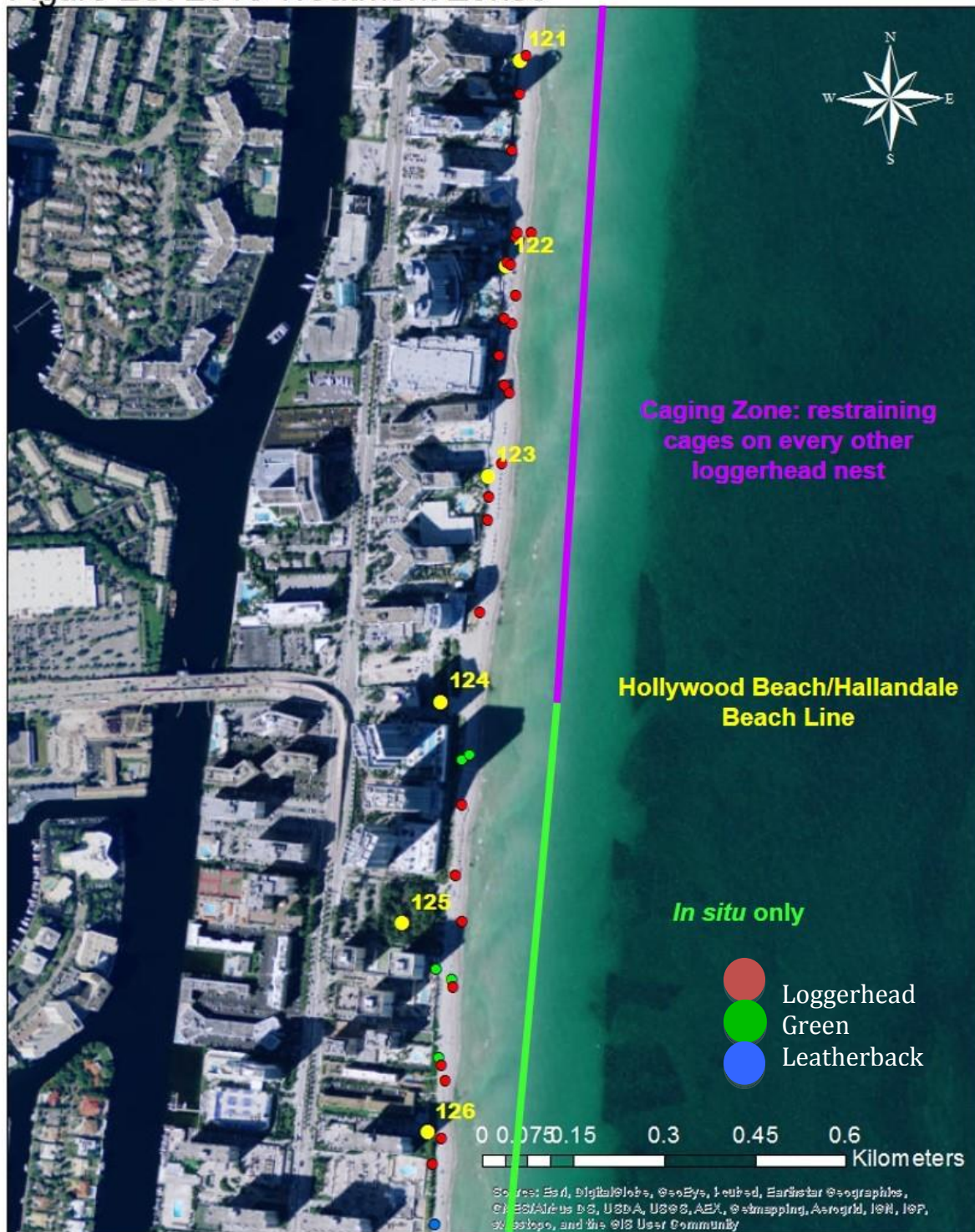


Figure 2V: 2015 Treatment Zones



Figure 3: Total number of nests and false crawls, all species combined for Broward County (2000-2015)

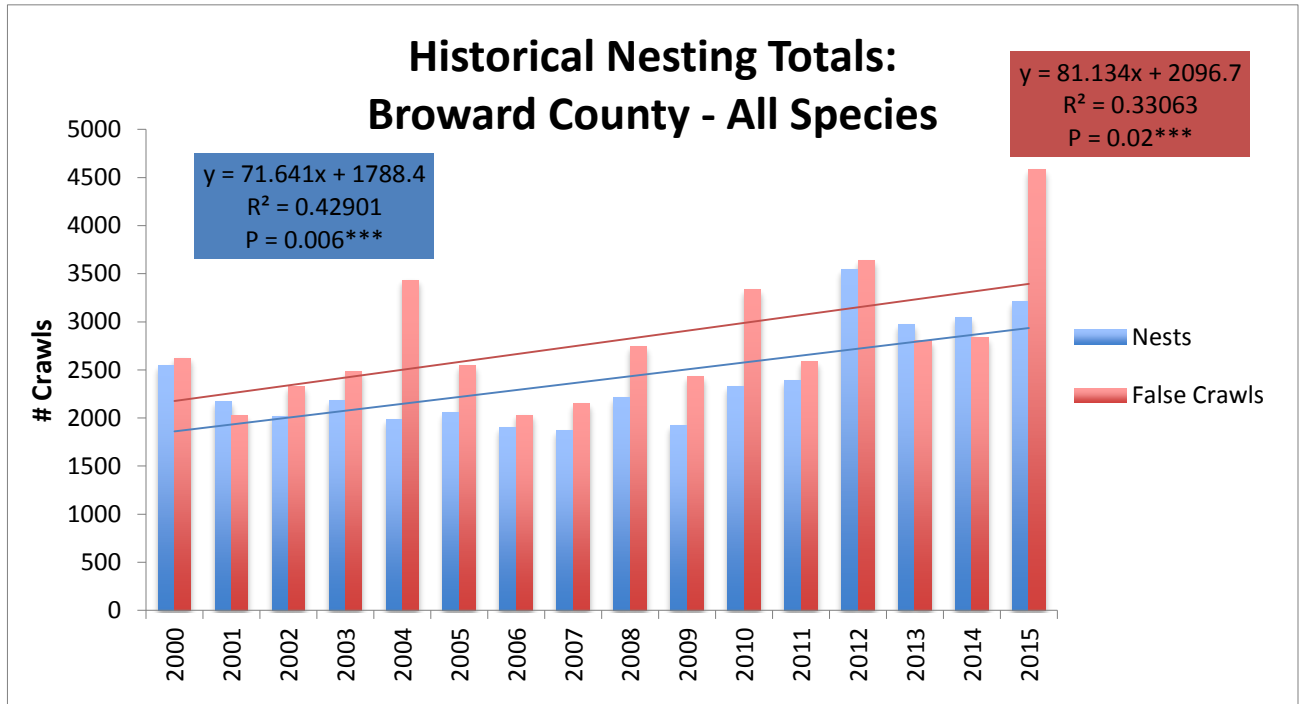


Figure 4: Nesting success (Nests in percentages, all species combined for Broward County (2000-2015)

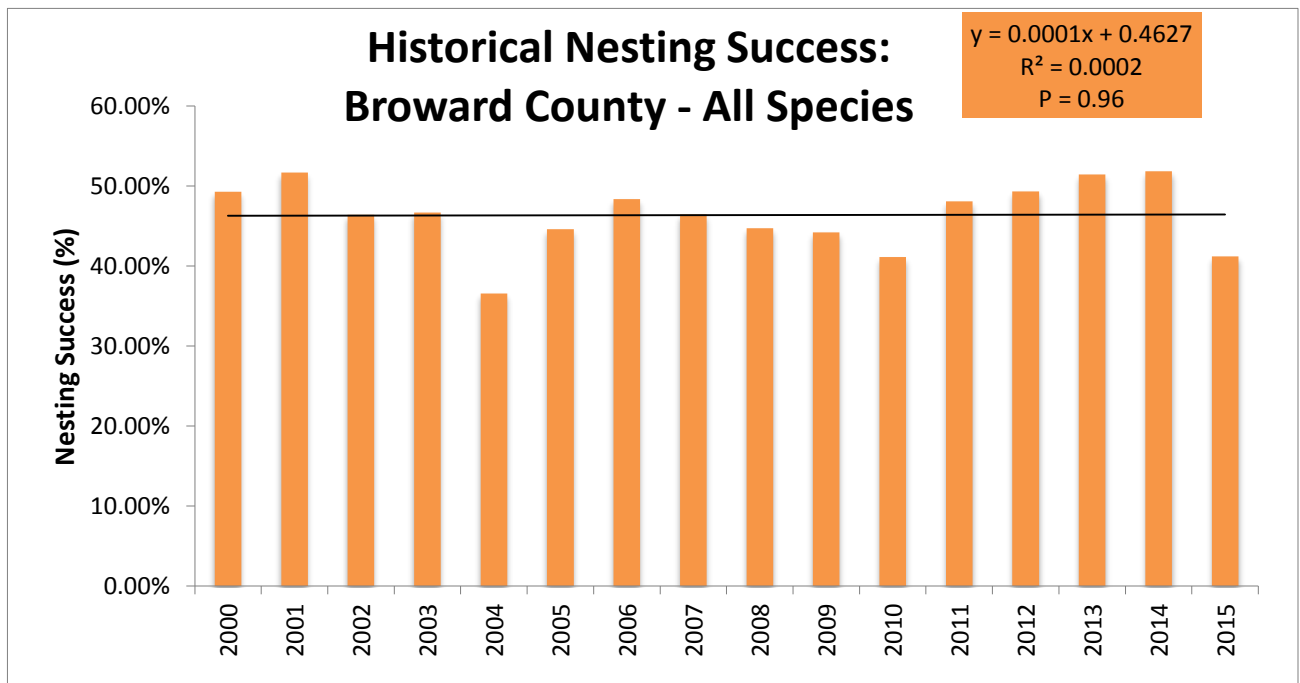


Figure 5: Number of nests laid per day in Broward County, Florida by species.

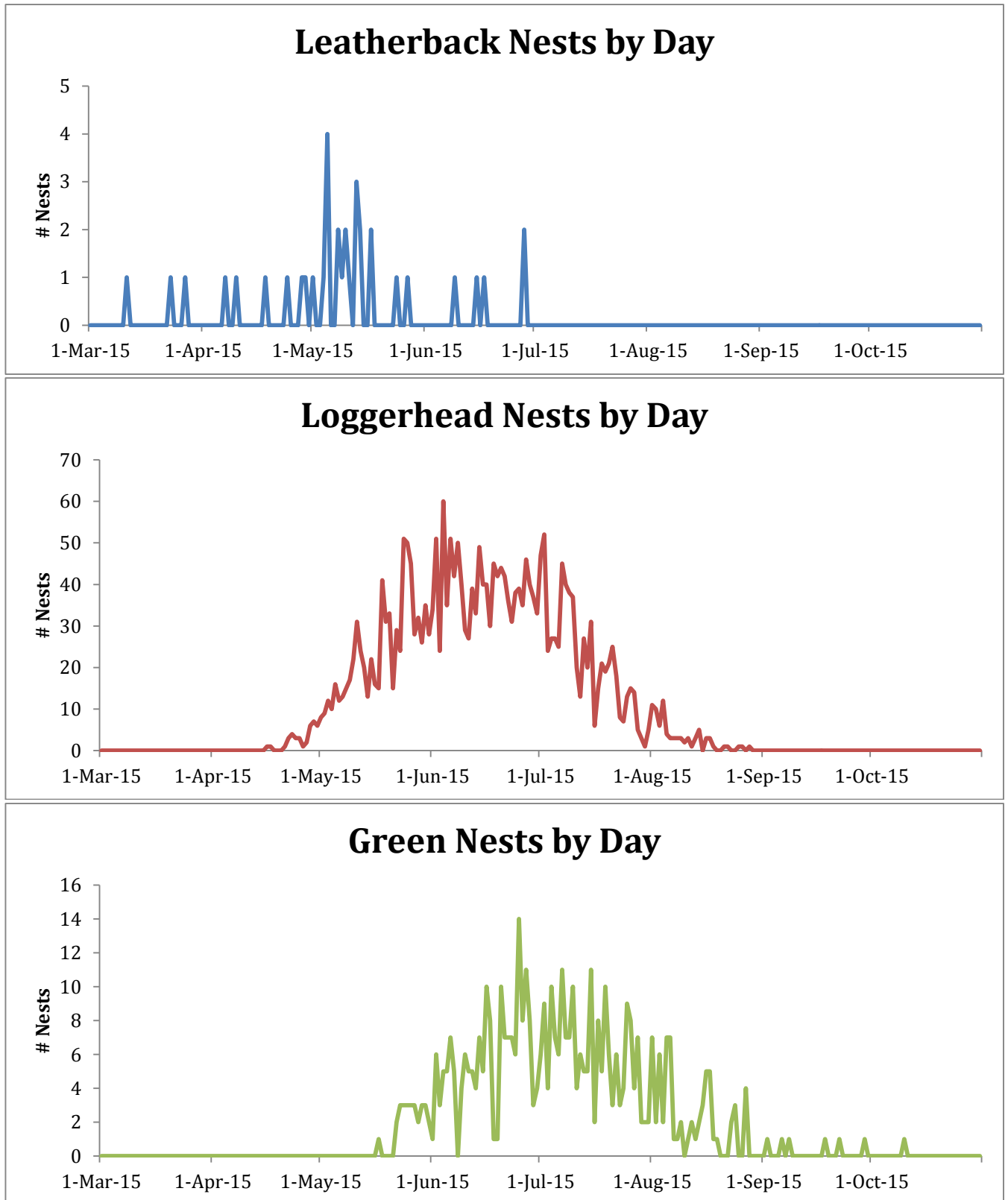


Figure 6: Historical nesting success in Broward County by species from 2000 – 2015.

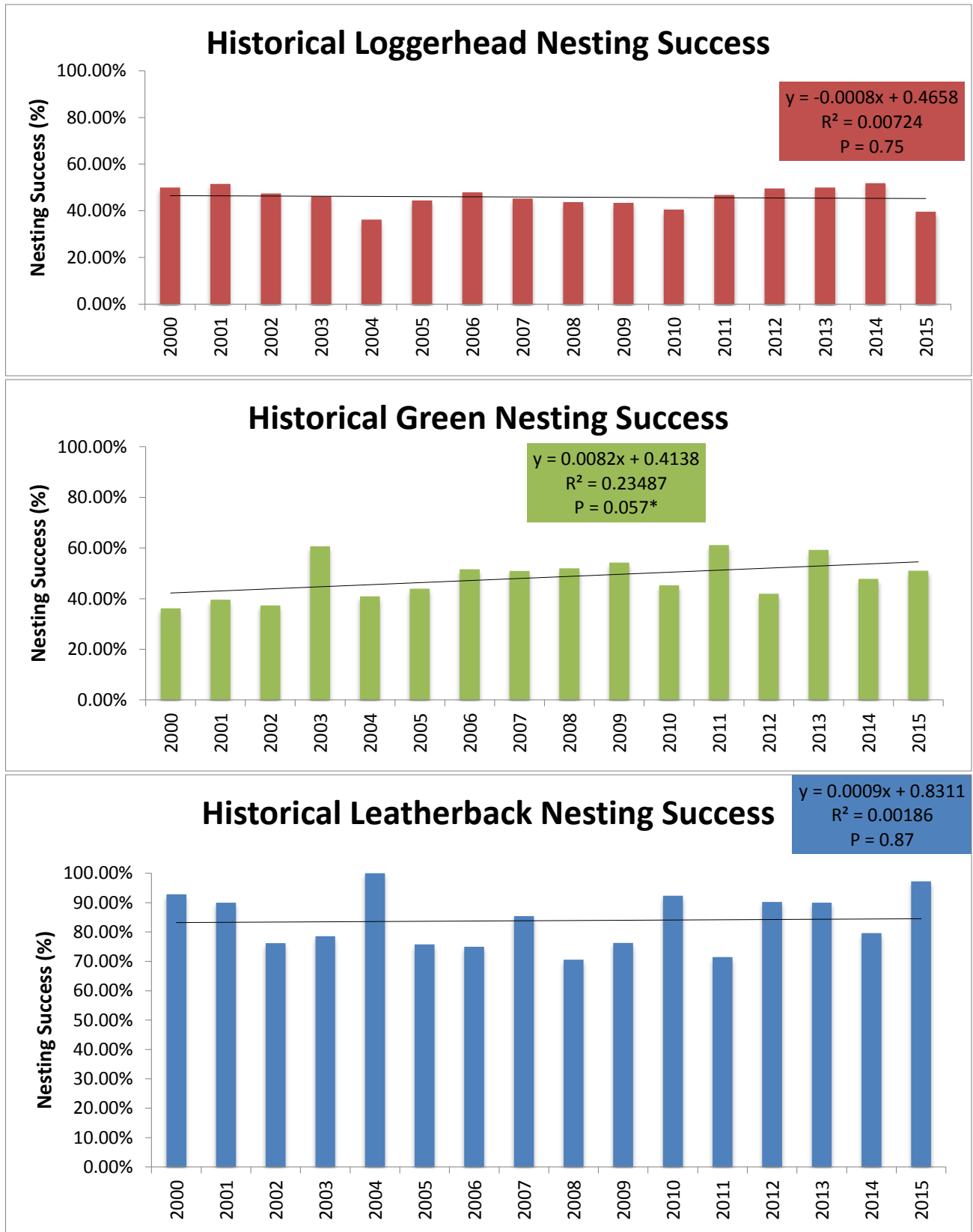


Figure 7: Historical nest activity (number of nests) in Broward County by species from 1981 – 2015.

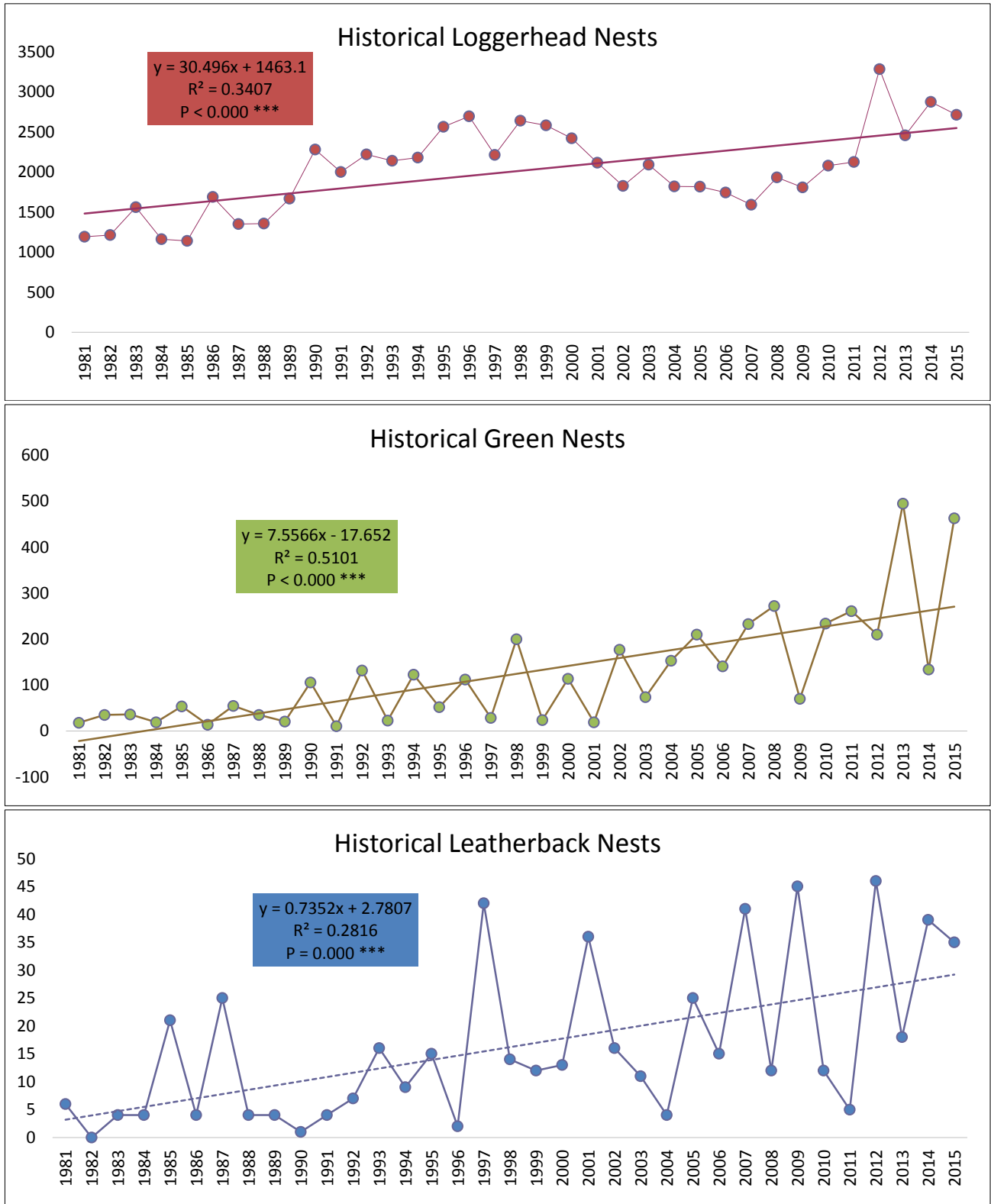


Figure 8: Historical Nest Relocation Activity – All Broward County (Except John U Lloyd)

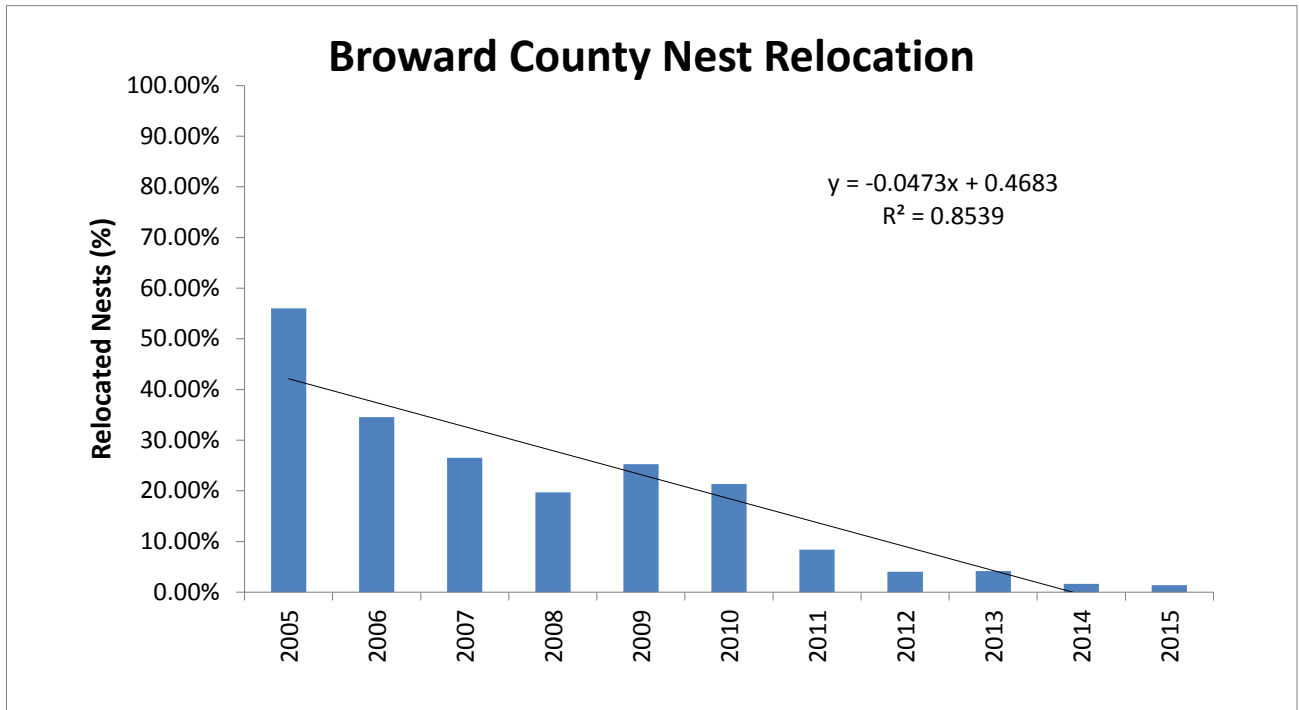


Figure 9a: Historical Disorientation Reporting by the BCSTCP – All Broward County (Except John U Lloyd)

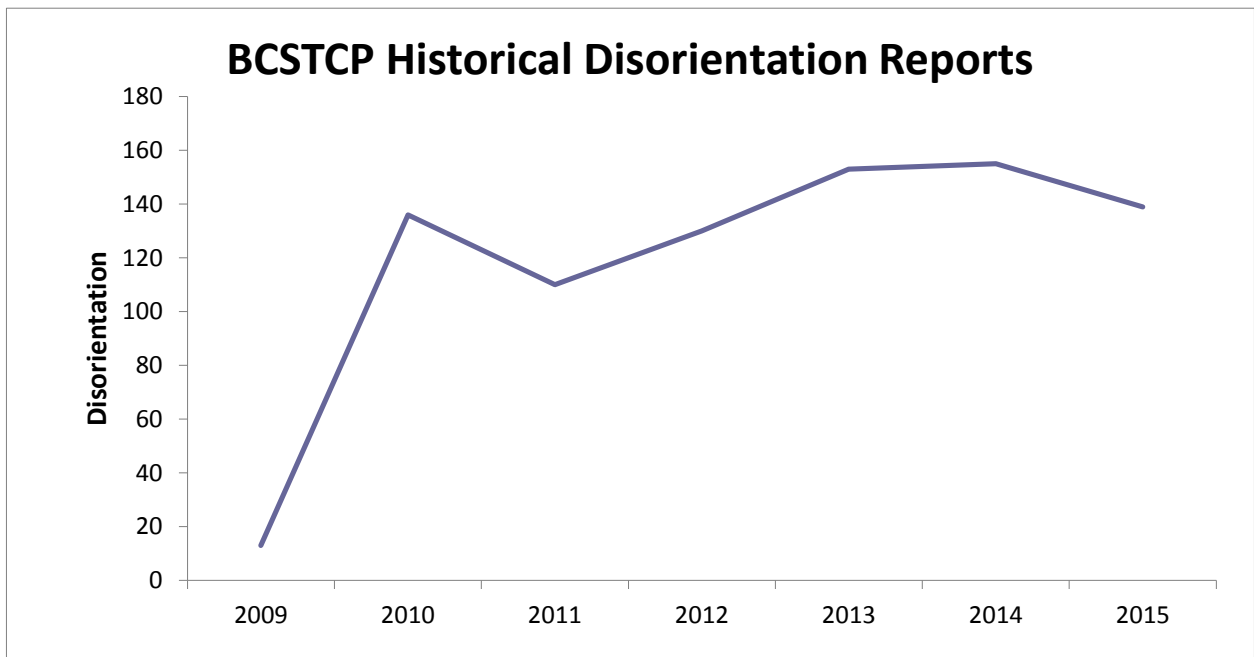


Figure 9b: All Disorientation Reports by Municipality; as Reported by BCSTCP, Sea Turtle Oversight Protection (S.T.O.P), and South Florida National Audubon Sea Turtle Program: Percent of Nests Experiencing Hatchling Disorientation

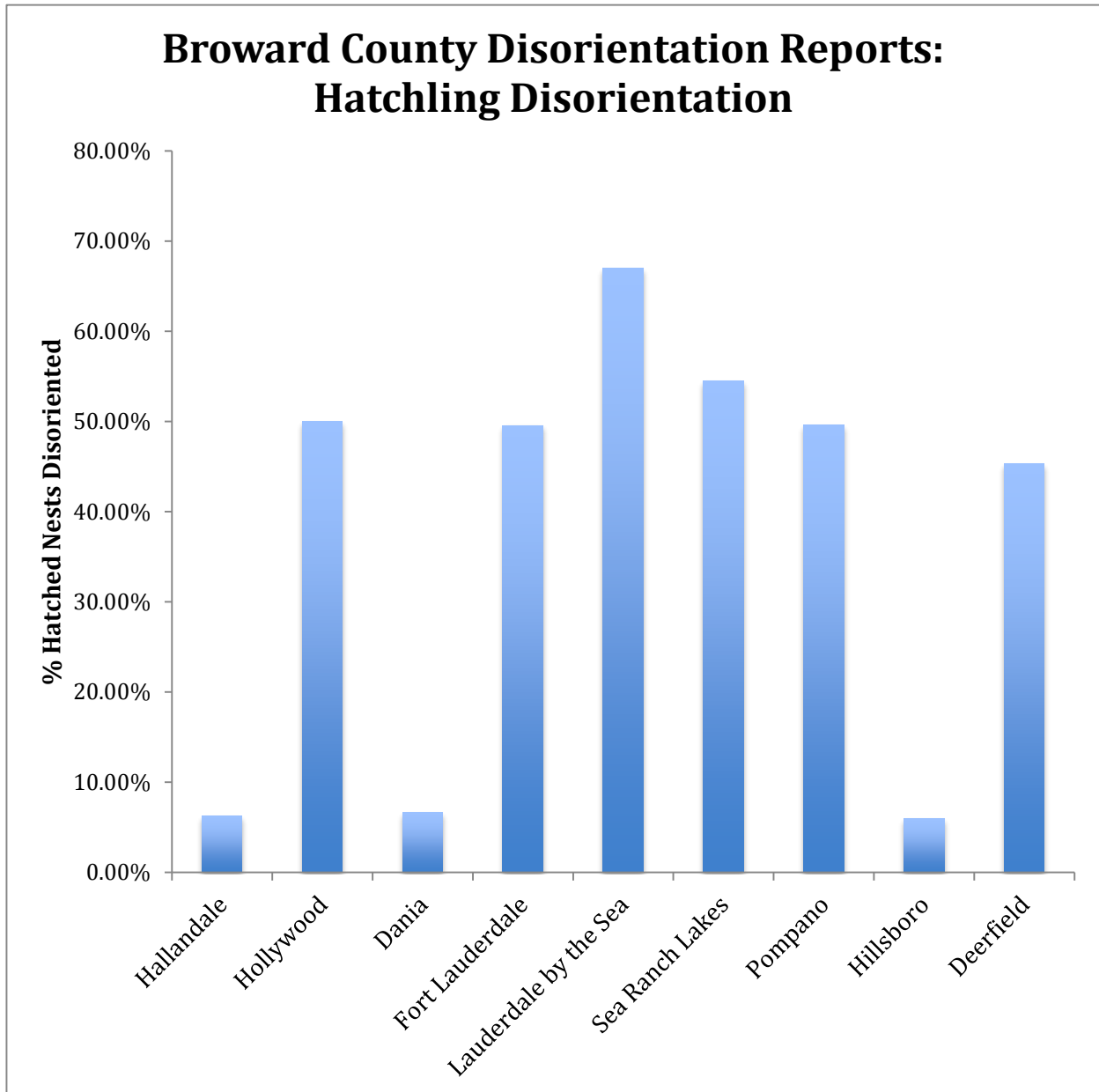


Figure 10: Percentage of nests that experienced predation in the Hillsboro Survey Zone, all species combined.

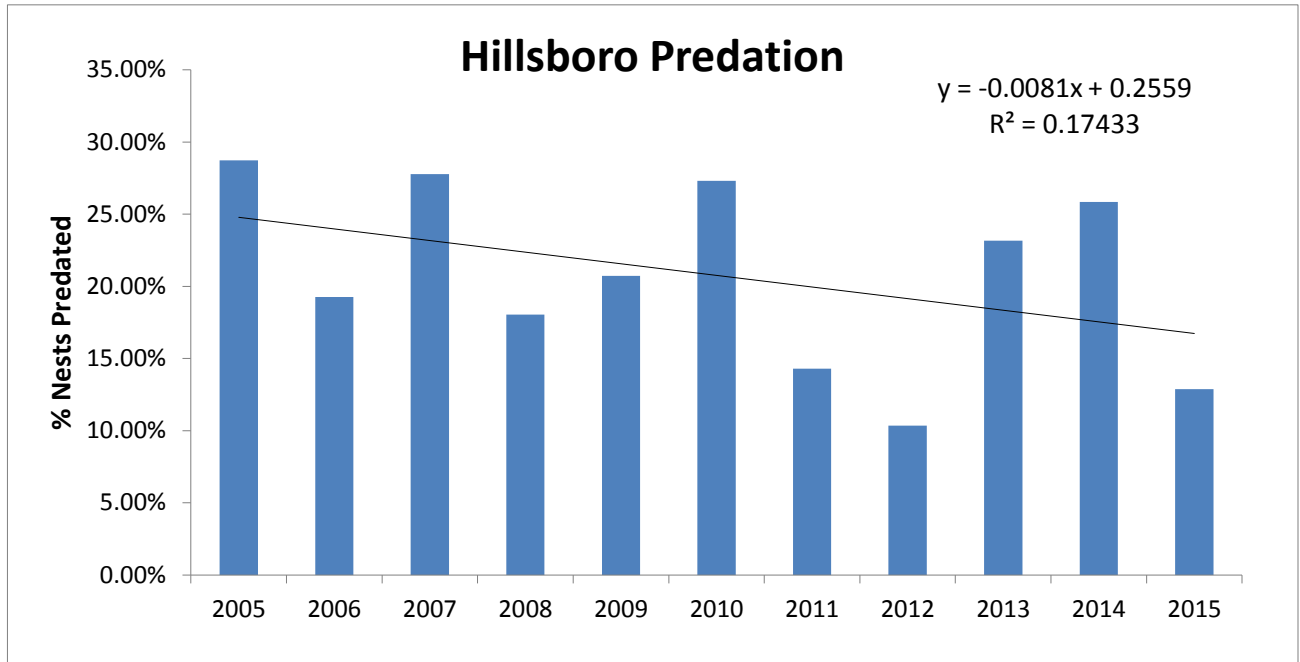


Figure 11: Percentage of nests that experienced predation in Broward County, all species and survey zones combined.

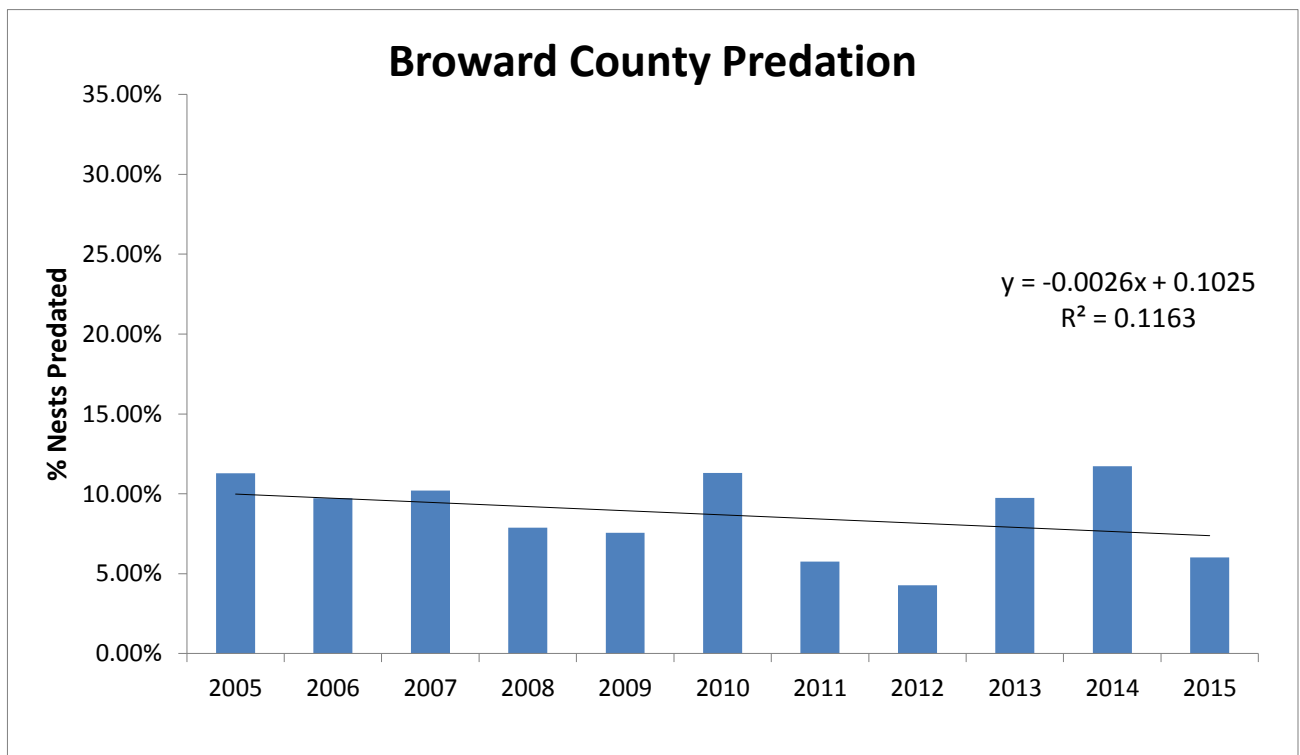
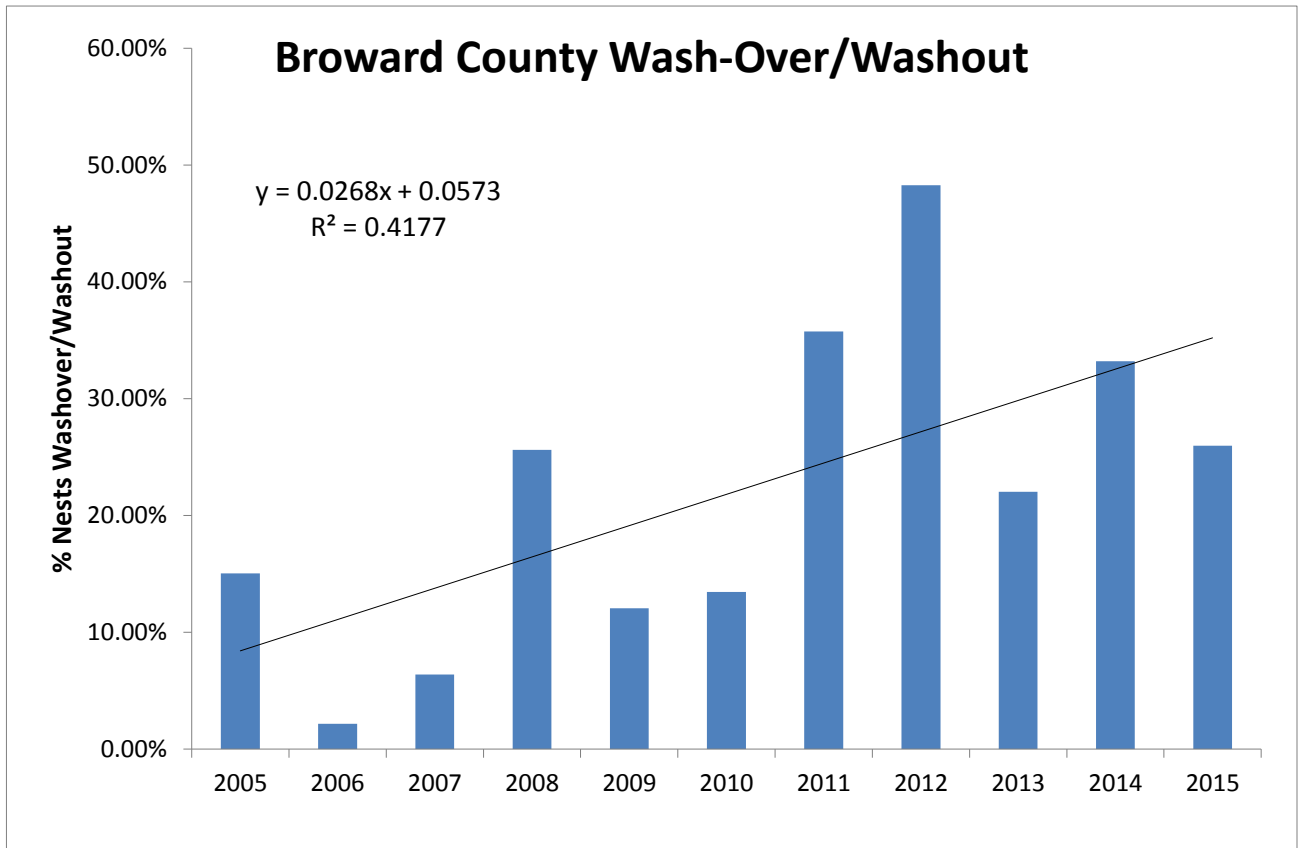


Figure 12: Historical Nest Washover/Inundation – All Broward County (Except John U Lloyd)



Appendix 1a: Summary of Sea Turtle Strandings and Emergency Line Calls

The Broward County Sea Turtle Conservation Program's Stranding Team responded to 76 stranding events from January 1, 2015 to December 21, 2015. Of these 37 turtles (29 *Chelonia mydas*, 6 *Caretta caretta*, 1 *Eretmochelys imbricata*, 1 Unknown species) were dead upon arrival (12 boat strike, 1 hooked, 6 predator attacks, 18 unknown cause of death), 10 of these were collected and frozen for use in a future FWC necropsies. The remaining dead stranded turtles were either buried on or just off the beach, or if in the water, or too large to move, they were marked (painted) so that we knew they were accounted for.

Thirty-five stranding responses were for live turtles. We had 1 – Hawksbill sea turtle (*Eretmochelys imbricata*), 4 – Loggerhead sea turtles (*Caretta caretta*), and 30 – Green sea turtles (*Chelonia mydas*). Of these; 18 were transported to Miami Seaquarium in Miami, Florida; 13 were taken to Gumbo Limbo Nature Center in Boca Raton, Florida for treatment and rehabilitation; 1 could be released on site after assessment.

Four stranding responses were for live turtles that died in transit to a rehabilitation facility. All green sea turtles (*Chelonia mydas*) 2 suffered from boat strikes, 1 predator attack, and 1 unknown cause of death.

An Emergency Response line is monitored 24 hours a day throughout the year to provide a contact point for anyone who finds a sea turtle in distress.

Summary of Sea Turtle Emergency Line Use:

Call Subject	Number Calls
Live Strandings	38
Dead Strandings	35
Strandings Outside Broward	7
Nest Locations	37
Hatchling Pick-up	38
Disorientations	3
Caging Inquiries	19
Lighting Concerns	8
Exposed Eggs	10
Other Wildlife Emergencies	21
Non-emergency Sea Turtle Inquiries (Turtle Walk/Release, etc)	167
Spam	76
Total	459

Appendix 1b: Example Sea Turtle Stranding Report

SEA TURTLE STRANDING AND SALVAGE NETWORK – STRANDING REPORT

OBSERVER'S NAME
 First Curtis M.I. J Last Slagle
 E-mail _____
 Affiliation Broward County Sea Turtle Conservation Program
 (Area code) Phone number _____

STRANDING DATE:
 Year 2014 Month 05 Day 30
 Turtle number by day 011

State coordinator must be notified within 24 hrs;
 this was done by phone (561)575-5407
 email fax (561)743-6228
 FWC • • • • • Alert Hotline 1-888-404-3922

SPECIES: (check one)
 CC = Loggerhead
 CM = Green turtle
 DC = Leatherback
 EI = Hawksbill
 LK = Kemp's ridley
 LO = Olive ridley
 UN = Unidentified
Check unidentified if not positive. Do not guess.

Photos taken? Yes No
 Species verified by state coordinator? Yes No

SEX: (check one)
 Immature, undetermined
 Female Male
 How was sex determined?
 Necropsy
 Tail length (adult only)
 Length of tail beyond carapace _____ cm/in

STRANDING LOCATION: Offshore (Atlantic or Gulf beach) Inshore (bay, river, sound, inlet, etc)
 State Florida County Broward
 Descriptive location (be specific) 11 & 45 NE 21st Ave, Deerfield, FL
Deerfield Lifeguard Stand #3
 Latitude 26. Longitude -80.

CONDITION: (check one)
 0 = Alive
 1 = Fresh dead
 2 = Moderately decomposed
 3 = Severely decomposed
 4 = Dried carcass
 5 = Skeleton, bones only

FINAL DISPOSITION: (check one)
 1 = Left on beach where found; painted? Yes* No(5)
 2 = Buried: on beach / off beach;
 carcass painted before buried? Yes* No
 3 = Salvaged: all / part(s), what/why? _____
 4 = Pulled up on beach/dune; painted? Yes* No
 6 = Alive, released
 7 = Alive, taken to rehab. facility, where? _____
 8 = Left floating, not recovered; painted? Yes* No
 9 = Other, explain _____
**If painted, what color? _____*

TAGS: Contact state coordinator before disposing of any tagged animal!!
 Flipper tags present at stranding? Yes No
 If so, has CMTTP been notified? Yes No
Check all 4 flippers. If found at stranding, record tag number(s)/tag location/return address

PIT tag scan? Yes No
Check all 4 flippers. If PIT tag found at stranding record id/tag location

 Checked for living tag? Yes No
 If found, record location (scute number & side)

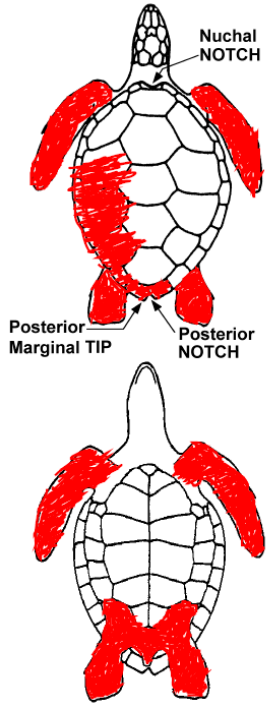
CARAPACE MEASUREMENTS: (see drawing)

Using calipers Choose unit
 Straight length (NOTCH-TIP) _____ cm/in
 Minimum length (NOTCH-NOTCH) _____ cm/in
 Straight width (Widest Point) _____ cm/in

Using non-metal measuring tape Choose unit
 Curved length (NOTCH-TIP) 101.5 cm
 Minimum length (NOTCH-NOTCH) 101.0 cm
 Curved width (Widest Point) 94.0 cm

.....
 Fibropapilloma-like tumors present? Yes No
 FP documentation form attached? Yes No

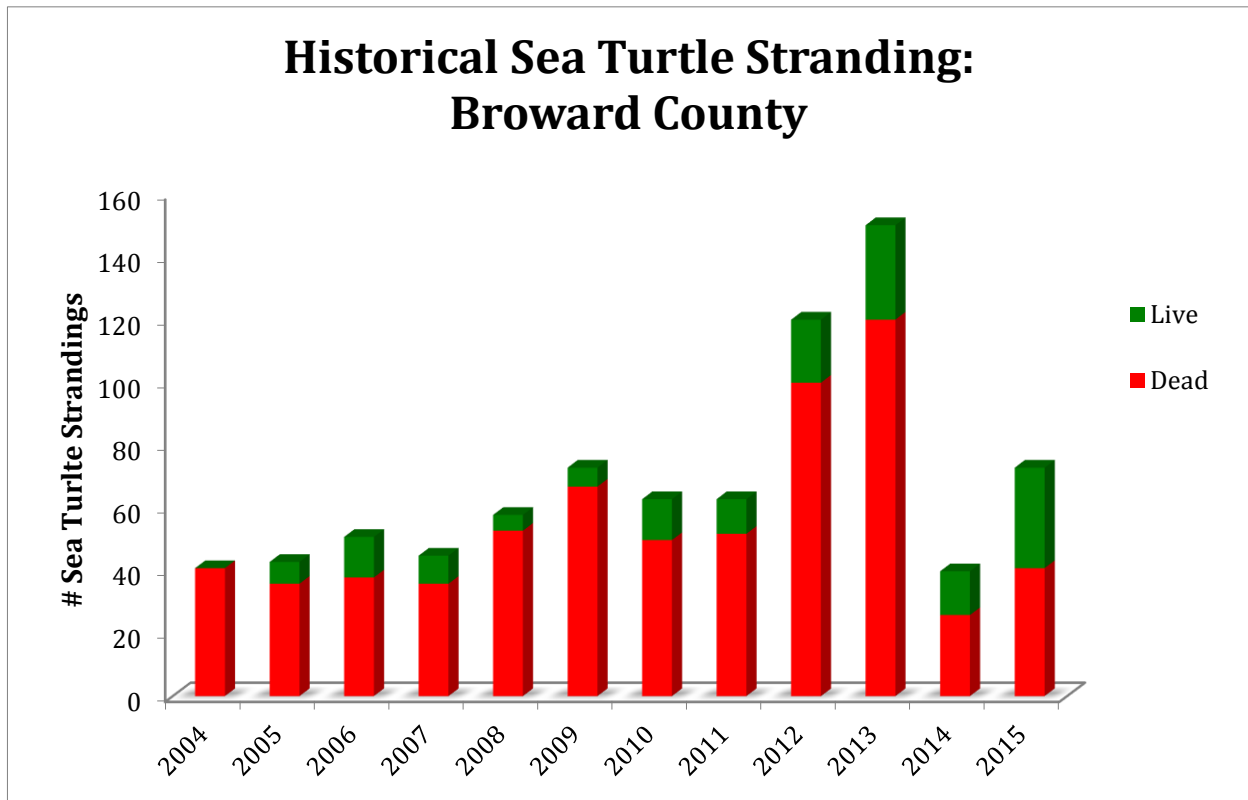
Weight actual / est. 120 lb



Mark wounds or abnormalities on diagrams at left and describe below (note tar or oil, gear or debris entanglement, propeller damage, epibiota, papillomas, emaciation, etc.). **Please note if no wounds or abnormalities were found.** If released, note if new tags were applied.

All flippers missing
Possible boat strike on left side of carapace with damage to left lateral scutes

Appendix 1c: Historical Sea Turtle Stranding: Broward County



Sea turtle stranding numbers have been relatively stable over the last 10 years generally staying around 40-65 strandings each year. However 2012 and 2013 both proved to be exceptionally high years with 120 and 150 strandings per year respectively. These large years greatly skew the “5-year average” which is why a longer history is shown here.

Appendix 2: Summary of Education/Outreach Activities

Marine turtles have a strong presence on the beaches of Broward County, Florida and thus within the community. One of the goals of the Broward County Sea Turtle Conservation Program is to provide engaging educational/outreach opportunities to the general public and especially students to bring awareness to individuals, businesses, beach users, and coastal residents to try to nurture stewardship towards a more suitable environment for these important animals. Educational flyers were distributed throughout the season to interested parties on the beach, at turtle talks, school visitations, and hatchling releases.

To date in 2015, the BCSTCP Presentation Team has conducted a total of 116 education/outreach events connecting with over 16,900 individuals!

From July 1, 2015 – September 4, 2015 we conducted 46 turtle talks (PowerPoint Presentation) that were followed by a public Hatchling Release with groups including: Anne Kolb Nature Center, Boy Scouts of America, Girl Scouts of America, Road Less Traveled, Buzzy Kids Inc., Conchologists of America, Broward County, Hillsboro Club, Wild Over Wildlife Club, SeaCor, Pompano Dive Center, Ebb Tide Resort, Florida Marine Aquarium Society Club, Hillsboro Police Department, NSU Alumni Relations, NSU Development and Community Engagement Department, NSU Ambassadors Board, and Family Groups that totaled over 1,900 individuals.

An additional 52 turtle education seminars (PowerPoint Presentation) were also conducted between January 19, 2015 and November 24, 2015 at/with the following locations/groups reaching over 5,055 individuals:

- 1) Kids Ecology – January 19, 2015
- 2) Virginia Shuman Young Elementary (Career Day) - January 30, 2015
- 3) Force-E Dive Center – March 5, 2015
- 4) Pompano Beach Ocean Rescue – March 10, 2015
- 5) Driftwood Middle School (Career Day) – March 17, 2015
- 6) Hola Mundo Beach Camp – April 1 & June 17, 2015
- 7) Salvation Army Yes Kids Can – April 16, 2015
- 8) Hollywood Ocean Rescue – April 20, 2015
- 9) Pine Crest School – April 21, 2015
- 10) West Regional Library – April 22, 2015
- 11) Girl Scout Troop – April 25, 2015
- 12) Pioneer Middle School – April 29, 2015
- 13) McNab Elementary (Career Day) – May 1, 2015
- 14) Royal Palm Elementary School (Career Day) – May 8, 2015
- 15) Hillsboro Club – May 13, 2015
- 16) Nova Blanche Forman Elementary (Career Day) – May 22, 2015
- 17) Oakridge Elementary (Career Day) – May 29, 2015
- 18) Camp Live Oak – Science of the Sea – June 16, July 14, August 10, & 12, 2015
- 19) Hollywood Sea Camp – June 18, 29, & July 20, 2015
- 20) Shalom Preschool Chabad – June 24, 2015
- 21) Marblue Montessori Academy – July 1, 2015

- 22) IGFA Summer Camp – July 6 & August 10, 2015
- 23) NSU Sherman Library – July 7 & 8, 2015
- 24) Indian Ridge School Summer Program – July 9, 2015
- 25) Northwest Regional Library Summer Program – July 16, 2015
- 26) American Heritage Science Adventure Camp – July 24, 2015
- 27) NSU Summer Exploration Camp – August 6, 2015
- 28) Marriott’s BeachPlace Towers – Aug 27; Sept 10, 24; Oct 7, 13, 20, 27; Nov 3, 10, 17, & 24
- 29) Orange Brook Elementary School – September 9, 2015
- 30) NSU Lower University School – September 16, 2015
- 31) Parkland Elementary – October 6, 2015
- 32) Glades Middle School (Career Day) – October 28, 2015
- 33) Pembroke Pines Charter School – November 4, 2015
- 34) David Posnack Jewish Day School – November 10, 2015

Our team participated in 17 Table Events between January 24, 2015 and November 14, 2015 where specimens could be examined, information handouts, brochures, door hangers, table tents and activity books were disseminated to event/festival goers reaching over 10,000 individuals:

- 1) Tri-Rail’s Rail Fun Day – January 24, 2015
- 2) Gumbo Limbo Nature Center Sea Turtle Day – February 28, 2015
- 3) Lauderdale-By-The-Sea TurtleFest – March 21-22, 2015
- 4) Loggerhead Marine Life Center TurtleFest – March 28, 2015
- 5) NSU Earth Month Celebration – April 1, 2015
- 6) RSMAS Career Fair – April 8, 2015
- 7) Tortuga Music Festival Conservation Village – April 11-12, 2015
- 8) City of Hollywood Earth Day Celebration – April 24, 2015
- 9) NSU Motion for the Ocean 5K – April 26, 2015
- 10) Flamingo Gardens KidzFest – May 25, 2015
- 11) Cooper City High School Career Day – May 28, 2015
- 12) World Oceans Day – June 7, 2015
- 13) Marine Industry Day – June 20, 2015
- 14) International Coastal Cleanup at John U. Lloyd State Park – September 19, 2015
- 15) Broward County Green Expo – November 14, 2015

Lastly, our team led an excavation demonstration for 20 girl scouts and their families on August 15, 2015, and a turtle educational seminar was given while excavating a loggerhead sea turtle nest in Hollywood, FL on a morning survey nest excavation.

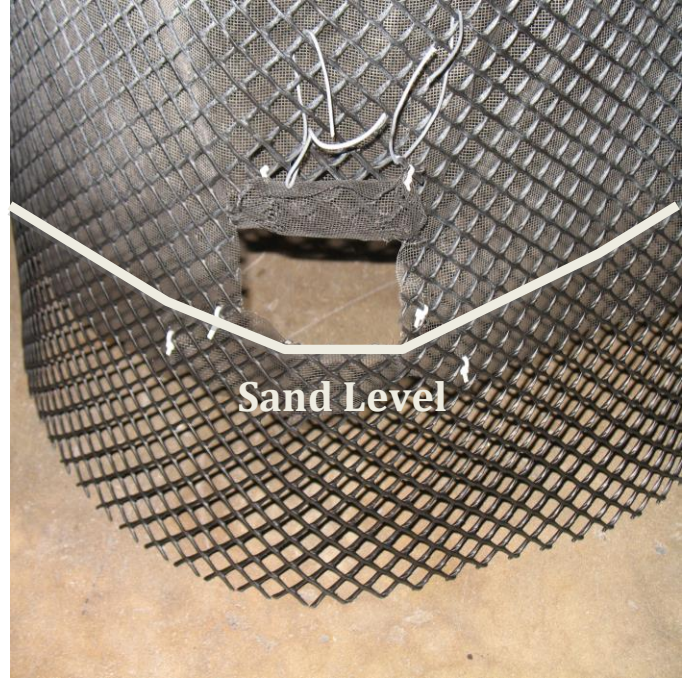
Appendix 3: Sea turtle nest warning sign

Sign affixed to all sea turtles nests in Broward County, Florida. Black lettering on yellow background. Size: 5.5" X 8.5".



Appendix 4: Sea Turtle Enclosure Cage and Sign

4A: Sea Turtle Hatchling Enclosure Cage Design with Escape Door



4B: Enclosure Cage Informational Sign 8.5x11 - (Affixed to each cage)



Appendix 5: Blank FWC Marine Turtle Disorientation Report

Permit Holder Initials Year Month Day Dis. # by Day County Code

FWC MARINE TURTLE DISORIENTATION REPORT

If you have any questions, please contact FWC at the Tequesta Field Laboratory (561) 882-5975

Fax reports to: (561) 743-6228 or Email reports to: SeaTurtleLighting@MyFWC.com

Send reports to: Disorientation Reports, FWC, 19100 SE Federal Highway, Tequesta, FL 33469

Marine Turtle Permit #: _____ Date of Incident: _____

Observer's Name: _____

Telephone (include area code): _____ E-mail address: _____

Location of Disorientation Event: (address, beach name and/or nearest landmark): _____

City: _____ County: _____

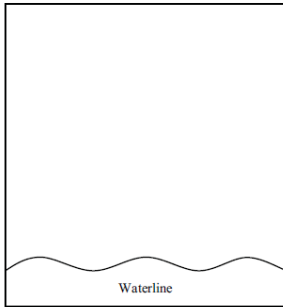
Local nest ID#: _____ Zone nest was located in: _____

Nest GPS Coordinates (use decimal degrees: i.e., Lat 26.845412 Long -80.458796):

Latitude: _____ Longitude: _____

SPECIES: (check one) <input type="checkbox"/> Cc = Loggerhead <input type="checkbox"/> Cm = Green Turtle <input type="checkbox"/> Dc = Leatherback <input type="checkbox"/> Un = Unidentified <input type="checkbox"/> O = Other _____	TYPE OF EVENT: (check one) <input type="checkbox"/> Adult – Nesting Emergence <input type="checkbox"/> Adult – False Crawl <input type="checkbox"/> Hatchling	NEST TREATMENT: (check all used) <input type="checkbox"/> Restraining Cage <input type="checkbox"/> Self-releasing Screen/Cage <input type="checkbox"/> Light Barrier (i.e., silt screen) <input type="checkbox"/> Relocated
--	---	---

Incident was documented during: (check one) Morning Survey Night Survey Daytime



Was the incident photographed? YES NO

Was the source nest found? YES NO

Was the nest excavated? YES NO

If "YES" report date of excavation: _____

Number of turtles disoriented:

1

2-10

11-50

>50

Disoriented turtles reaching the water:

All

Some

None

Not investigated

Were any disoriented turtles found dead? YES NO

If "YES" indicate the number: _____

Addresses/landmarks turtle(s) disoriented towards: _____

Were probable/possible light source(s) identified? YES NO

If "NO" indicate why: (check one) No lights present Too many lights Other: _____

Indicate categories of light(s) identified as probable/possible lighting sources: (check all that apply)

<input type="checkbox"/> parking lot	<input type="checkbox"/> street light	<input type="checkbox"/> condominium (interior)
<input type="checkbox"/> dune crossover	<input type="checkbox"/> single family home (interior)	<input type="checkbox"/> condominium (exterior)
<input type="checkbox"/> restaurant/bar	<input type="checkbox"/> single family home (exterior)	<input type="checkbox"/> sky glow/urban glow
<input type="checkbox"/> pier	<input type="checkbox"/> sign	<input type="checkbox"/> other: _____

Additional comments (use back if necessary): _____

Local authority provided a copy of this report: City County FWC Other: _____

Signature of Observer

Date

Appendix 7: Lighting Survey Lighting Examples

Cobra: Streetlights pretty bright look like a cobra head



Acorn: Normally streetlights look like acorns sometimes turtle friendly with amber bulb



Floodlight: Very bright usually attached to corners of buildings



Carriage: Normally a streetlight, light looks like would be on horse drawn carriage



Globe: Circular normally streetlights sometimes half globes are seen



NEMA: Extremely bright streetlight if see one let me know where as we have covers for these during turtle season



Bell: Typically streetlights that look like a bell



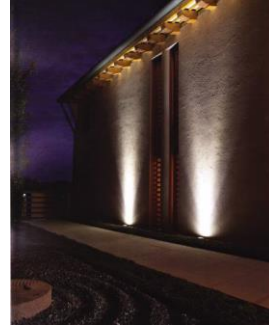
Wall mount: Anything that is mounted to a wall of a building that isn't already described here



Ceiling mounted: Anything that is mounted to a ceiling that isn't already described here



Up-lighting: Lights that are directed upwards



Bollards: A lot are turtle friendly if fitted properly mostly pathway lights attached to ground



Landscape: Directed towards trees or vegetation



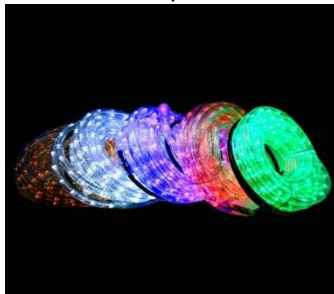
Spotlights: Very bright direct light towards something specific



Interior: Any lights that are inside and on



Rope lighting: Multiple small lights all attached to a rope



Posted: Any other lights on a pole not specifically known



UFO: Typically streetlights that look like UFOs



Canister: Light housed in a canister turtle friendly if is pointing directly down



Pool lights: Lights that are underwater



Neon: Lights that show are neon colors



Signage: Signs that are lit up



Fluorescent: Extremely bright lights usually seen in car garages



Step lights: Small lights that illuminate steps of a stairway




Walkway lights: Lights that illuminate a walkway



Appendix 8: 2014 Florida Fish and Wildlife Conservation Commission Sea Turtle Nesting Reports

Ft Lauderdale:

 FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION FISH AND WILDLIFE RESEARCH INSTITUTE ANNUAL REPORT FOR THE STATEWIDE NESTING BEACH SURVEY, 2015			
1. PRINCIPAL PERMIT HOLDER INFORMATION			
Principal Permit Holder:	Curtis Slagle	Permit Number:	214
Organization:	Broward County Sea Turtle Conservation Program		
Address:	590 SE 12th St., Apt. 207 Dania Beach, FL 33004		
County:	Broward	Email Address:	cs1858@nova.edu
Day Telephone (include area code):	(954) 383-2072	Night Telephone:	(954) 383-2072
Beach Name:	Ft Lauderdale Beach		
Point of Contact & Phone #	Curtis Slagle - 954-383-2072	Email Address for Point of Contact: (if different from above)	
2. GENERAL SURVEY INFORMATION			
Survey Boundary Information: Please describe survey boundaries geographically. If boundaries have changed, please enter the new boundaries in the space below. <u>Be specific</u> and use known landmarks that can be found on a map (or include a marked map).			
Beginning Survey Boundary:	Commerical Blvd. Pier (26.18948, -80.09466)		
Ending Survey Boundary:	Port Everglades Inlet (26.09508, -80.10500)		
Beach Length: KM (miles):	10.6 km (6.6 miles)	Was this the same survey area as last year? (Y or N)	Y
IF NO, please explain the specific differences, new survey length, AND why the survey area changed:			
N/A			
Start Date of Survey (mm/dd/yy):		03/01/15	End Date of Survey (mm/dd/yy): 10/31/15
Time of Day Surveyed: Start (include AM or PM)	30 Minutes Before Sunrise (6-7 AM)	Finish (include AM or PM)	(8-9 AM)
Number of Days Per Week Surveyed:	7		
Total # of Days Surveyed in 2015 (this is the total # of days between start and end dates MINUS any missed days):	245		
If you did not survey 7 days per week throughout the nesting season, please describe your survey schedule (how many days per week, what days of the week). It is recommended to adhere to a fixed schedule if 7 days/week is not possible (e.g., 5 days/week every week), and these days would preferably be consecutive.			
N/A			
If you did not survey 7 days per week, how were tracks counted on the day that surveys resumed after a missed day?			
N/A			
Were all non-nesting crawls (false crawls) counted during your survey? Yes or No			Yes
How many people were involved in surveying your nesting beach this season?			25

3. NESTING BEACH MANAGEMENT INFORMATION			
Do you collect GPS data for your nests? (Y / N)	Y	Do you save (electronic or paper files) these data? (Y/N)	Y
If nests were RELOCATED, were they relocated Individually (Ex: simply moving the nest directly landward of the original location or otherwise maintaining natural nest spacing) or in a Group with other relocated nests (i.e., self-releasing and/or restraining hatchery)?			Individually
Please give reasons for relocating nests. (Example: nest located below high tide line, in high foot traffic area, etc.)			
Nest below high tide line, donor zones designated by FWC, and/or exposed eggs.			
If a HATCHERY was used, please give reasons AND specific location:			
N/A			
Do you mark nests for inventory to determine hatching success?	Yes or No		Yes
If yes, how many nests were inventoried in 2015? (Note: data for all inventoried nests must be submitted on the Nest Inventory spreadsheet)	Yes or No		845
Do you participate in FWRI's Nest Productivity Assessment?	Yes or No		No
4. FATE OF NEST INFORMATION (for marked and unmarked nests)			
How many nests were negatively affected by predators other than humans during the course of the season? Note: this includes both partially and completely predated nests			20
List all non-human predators that were documented predated nests this season:			
Fox and crab			
If predator control methods other than screening/caging were employed, please describe below:			
N/A			
How many nests were negatively affected by the nesting female or another nesting sea turtle?			0
How many nests were negatively affected by roots (i.e., damaged eggs, impeded hatching emergence)?			0
How many nests were negatively affected by erosion, accretion, inundation, and storm-related events PRIOR to hatching? Note: this <u>does not</u> include stake loss.			160
Please give details:		160 nests experienced a wash over event. 44 of 160 were completely washed out.	
		8 of 160 were relocated due to exposed eggs. 14 of 160 nests had to be reestablished.	
How many nests were taken or disturbed by humans (Example: nest dug into, eggs removed, etc.)? Note: this <u>does not</u> include stake removal.			4
Please give details:		Nests were dug into without removal of eggs or hatchlings	
If human disturbances occurred, were they reported to law enforcement?			Yes
How many disorientation events occurred on this survey area in 2015?			36
If disorientation events occurred, have all disorientation reports been submitted to FWC? Yes or No			Yes
I certify the above information to be true and accurate to the best of my knowledge. (type in name & date)			
Curtis Slagle		Date:	11/23/2015



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FISH AND WILDLIFE RESEARCH INSTITUTE
ANNUAL REPORT FOR THE STATEWIDE NESTING BEACH SURVEY, 2015**

1. PRINCIPAL PERMIT HOLDER INFORMATION

Principal Permit Holder:	Curtis Slagle	Permit Number:	214
Beach Name:	Ft Lauderdale Beach		

2. GENERAL NESTING DATA for All nests on this survey area (Marked, Unmarked, & Misidentified Nests)

	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
Total # of Nests	945	100	6	0	0
Total # of Non-Nesting Emergences (False Crawls)	1262	133	0	0	0
Date (mm/dd/yy) of First Documented Nest	04/22/15	05/22/15	03/27/15		
Date (mm/dd/yy) of Last Documented Nest	08/28/15	10/10/15	06/28/15		

Total # of Nests <i>Prior</i> to 15 May:	84	0	4	0	0
Total # of Nests <i>After</i> 31 Aug:	0	5	0	0	0

Comments: 1 Nest with an unknown species - Date laide 7/18/2015

In the spaces below, please provide information on the initial nest treatment (e.g., in situ, screened, relocated, etc.). For example, if the initial treatment was in situ with no protection, it should be included in "(a) # of Nests left in place without additional protection" even if you later relocate the nest due to erosion.

Nest Data for nests left in place (where the turtle deposited the clutch): These nests may be left without additional protection, screened with a self-releasing flat screen, or covered with self-releasing or restraining above-ground cages.

Record the number of nests by category and species. For each species, rows a+b+c+d should equal the total number of nests left in place. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS LEFT IN PLACE (a + b + c + d)	933	97	0	0	0
(a) # of Nests left in Place without Additional Protection	933	97	0	0	0
(b) # of Nests left in Place with Self-Releasing Flat Screen	0	0	0	0	0
(c) # of Nests left in Place with Self-Releasing Cage	0	0	0	0	0
(d) # of Nests left in Place with Restraining Cage	0	0	0	0	0

Relocated Nest Data: Relocated nests are those where the clutch is removed from its original site of deposition and reburied at another site. These nests may be relocated to individual sites or as a group to a hatchery (a permanent or semi-permanent fenced or caged area where many nests are re-buried as a group). As with nests left in place, relocated nests may be left without additional protection, covered with self-releasing flat screen, or covered with a self-releasing for restraining above-ground cages. Hatcheries may be self-releasing (hatchlings escape unaided) or restraining (hatchlings cannot escape unaided).

Record the number of nests by category and species. For each species, rows a+b+c+d+e+f should equal the total number of relocated nests. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS RELOCATED (a + b + c + d + e + f)	12	3	0	0	0
(a) # of Relocated Nests without Additional Protection	12	3	0	0	0
(b) # of Relocated Nests with Self-Releasing Flat Screen	0	0	0	0	0
(c) # of Relocated Nests with Self-Releasing Cage	0	0	0	0	0
(d) # of Relocated Nests with Restraining Cage	0	0	0	0	0
(e) # of Relocated Nests to Self-Releasing Hatchery	0	0	0	0	0
(f) # of Relocated Nests to Restraining Hatchery	0	0	0	0	0


Additional Comments for the 2015 Season

Beach Name:

Ft Lauderdale Beach

<p align="center">Nesting Beach Management Information (e.g., predation, storms, poaching, etc.)</p>	<p>Storms - 126 nests were impacted by Tropical storm Erika: 126 washed over, 43 of which were washed out, 16 of which were reestablished, and 4 of which was relocated.</p> <p align="center">Restraining Caging - Storm and high tide events resulted in multiple cages having to be removed sporadically throughout the season. Most cages were able to be replaced within three days of removal. 22 of 25 restraining cages were inventoried. The restraining cages not inventoried were either washed out or the egg chamber location was lost from Tropical Storm Erika</p> <p>Poaching - Two unsuccessful poaching attempts documented, seven nests were vandalized by the removal of stakes.</p>
<p align="center">General Nesting Data (e.g., nests, false crawls)</p>	<p align="center">1052 total nests and 1395 total false crawls</p> <p align="center">237 ONA Reports and 36 DIS Reports</p> <p align="center">24 missed nests, 16 associated with a false crawl</p>
<p align="center">Nest Success Data</p>	<p align="center">845 nests inventoried and 204 nests not inventoried and 3 nests pending inventory</p> <p align="center">77.12% Hatch Success and 65.31% Emergence Success</p>
<p align="center">Miscellaneous Comments Regarding Data</p>	<p align="center">Restraining cages were utilized as a conservation effort for local lighting issues.</p>

Pompano/Lauderdale By The Sea:

 FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION FISH AND WILDLIFE RESEARCH INSTITUTE ANNUAL REPORT FOR THE STATEWIDE NESTING BEACH SURVEY, 2015			
1. PRINCIPAL PERMIT HOLDER INFORMATION			
Principal Permit Holder:	Curtis Slagle		Permit Number: 214
Organization:	Broward County Sea Turtle Conservation Program		
Address:	590 SE 12th St., Apt. 207 Dania Beach, FL 33004		
County:	Broward	Email Address:	cs1858@nova.edu
Day Telephone (include area code):	(954) 383-2072	Night Telephone:	(954) 383-2072
Beach Name:	Pompano/Lauderdale-by-the-Sea		
Point of Contact & Phone #	Curtis Slagle - 954-383-2072	Email Address for Point of Contact: (if different from above)	
2. GENERAL SURVEY INFORMATION			
Survey Boundary Information: Please describe survey boundaries geographically. If boundaries have changed, please enter the new boundaries in the space below. <u>Be specific</u> and use known landmarks that can be found on a map (or include a marked map).			
Beginning Survey Boundary:	Hillsboro Inlet (26.25801, -80.08185)		
Ending Survey Boundary:	Commerical Blvd. Pier (26.18948, -80.09466)		
Beach Length: KM (miles):	7.7 km (4.8 miles)	Was this the same survey area as last year? (Y or N)	Y
IF NO, please explain the specific differences, new survey length, AND why the survey area changed:			
N/A			
Start Date of Survey (mm/dd/yy):		03/01/15	End Date of Survey (mm/dd/yy): 10/31/15
Time of Day Surveyed: Start (include AM or PM)		30 Minutes Before Sunrise (6-7 AM)	Finish (include AM or PM) (8-9 AM)
Number of Days Per Week Surveyed:		7	
Total # of Days Surveyed in 2015 (this is the total # of days between start and end dates MINUS any missed days):			245
If you did not survey 7 days per week throughout the nesting season, please describe your survey schedule (how many days per week, what days of the week). It is recommended to adhere to a fixed schedule if 7 days/week is not possible (e.g., 5 days/week every week), and these days would preferably be consecutive.			
N/A			
If you did not survey 7 days per week, how were tracks counted on the day that surveys resumed after a missed day?			
N/A			
Were all non-nesting crawls (false crawls) counted during your survey? Yes or No			Yes
How many people were involved in surveying your nesting beach this season?			25

3. NESTING BEACH MANAGEMENT INFORMATION			
Do you collect GPS data for your nests? (Y/N)	Y	Do you save (electronic or paper files) these data? (Y/N)	Y
If nests were RELOCATED, were they relocated Individually (Ex: simply moving the nest directly landward of the original location or otherwise maintaining natural nest spacing) or in a Group with other relocated nests (i.e., self-releasing and/or restraining hatchery)?			Individually
Please give reasons for relocating nests. (Example: nest located below high tide line, in high foot traffic area, etc.)			
Nest below high tide line, donor zones designated by FWC, and/or exposed eggs.			
If a HATCHERY was used, please give reasons AND specific location:			
N/A			
Do you mark nests for inventory to determine hatching success?		Yes or No	Yes
If yes, how many nests were inventoried in 2015? (Note: data for all inventoried nests must be submitted on the Nest Inventory spreadsheet)		Yes or No	593
Do you participate in FWRI's Nest Productivity Assessment?		Yes or No	No
4. FATE OF NEST INFORMATION (for marked and unmarked nests)			
How many nests were negatively affected by predators other than humans during the course of the season? Note: this includes both partially and completely predated nests			4
List all non-human predators that were documented predated nests this season:			
CRAB and UNKNOWN			
If predator control methods other than screening/caging were employed, please describe below:			
N/A			
How many nests were negatively affected by the nesting female or another nesting sea turtle?			0
How many nests were negatively affected by roots (i.e., damaged eggs, impeded hatchling emergence)?			0
How many nests were negatively affected by erosion, accretion, inundation, and storm-related events PRIOR to hatching? Note: this <u>does not</u> include stake loss.			119
Please give details:		119 nests experienced a wash over event. 23 of 119 were completely washed out.	
		4 of 119 were relocated due to exposed eggs. 10 of 119 nests had to be reestablished.	
How many nests were taken or disturbed by humans (Example: nest dug into, eggs removed, etc.)? Note: this <u>does not</u> include stake removal.			3
Please give details:		Nests were dug into without removal of eggs or hatchlings	
If human disturbances occurred, were they reported to law enforcement?			Yes
How many disorientation events occurred on this survey area in 2015?			72
If disorientation events occurred, have all disorientation reports been submitted to FWC? Yes or No			Yes
I certify the above information to be true and accurate to the best of my knowledge. (type in name & date)			
Curtis Slagle		Date:	11/23/2015



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FISH AND WILDLIFE RESEARCH INSTITUTE
ANNUAL REPORT FOR THE STATEWIDE NESTING BEACH SURVEY, 2015**

1. PRINCIPAL PERMIT HOLDER INFORMATION

Principal Permit Holder: Curtis Slagle	Permit Number: 214
Beach Name: Pompano/Lauderdale-by-the-Sea	

2. GENERAL NESTING DATA for All nests on this survey area (Marked, Unmarked, & Misidentified Nests)

	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
Total # of Nests	557	23	13	0	0
Total # of Non-Nesting Emergences (False Crawls)	765	26	0	0	0
Date (mm/dd/yy) of First Documented Nest	04/21/15	05/25/15	03/11/15		
Date (mm/dd/yy) of Last Documented Nest	08/17/15	07/31/15	06/15/15		

Total # of Nests Prior to 15 May:	61	0	10	0	0
Total # of Nests After 31 Aug:	0	0	0	0	0

Comments: N/A

In the spaces below, please provide information on the initial nest treatment (e.g., in situ, screened, relocated, etc.). For example, if the initial treatment was in situ with no protection, it should be included in "(a) # of Nests left in place without additional protection" even if you later relocate the nest due to erosion.

Nest Data for nests left in place (where the turtle deposited the clutch): These nests may be left without additional protection, screened with a self-releasing flat screen, or covered with self-releasing or restraining above-ground cages.

Record the number of nests by category and species. For each species, rows a+b+c+d should equal the total number of nests left in place. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS LEFT IN PLACE (a + b + c + d)	551	23	13	0	0
(a) # of Nests left in Place without Additional Protection	551	23	13	0	0
(b) # of Nests left in Place with Self-Releasing Flat Screen	0	0	0	0	0
(c) # of Nests left in Place with Self-Releasing Cage	0	0	0	0	0
(d) # of Nests left in Place with Restraining Cage	0	0	0	0	0

Relocated Nest Data: Relocated nests are those where the clutch is removed from its original site of deposition and reburied at another site. These nests may be relocated to individual sites or as a group to a hatchery (a permanent or semi-permanent fenced or caged area where many nests are re-buried as a group). As with nests left in place, relocated nests may be left without additional protection, covered with self-releasing flat screen, or covered with a self-releasing for restraining above-ground cages. Hatcheries may be self-releasing (hatchlings escape unaided) or restraining (hatchlings cannot escape unaided).

Record the number of nests by category and species. For each species, rows a+b+c+d+e+f should equal the total number of relocated nests. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS RELOCATED (a + b + c + d + e + f)	6	0	0	0	0
(a) # of Relocated Nests without Additional Protection	0	0	0	0	0
(b) # of Relocated Nests with Self-Releasing Flat Screen	0	0	0	0	0
(c) # of Relocated Nests with Self-Releasing Cage	0	0	0	0	0
(d) # of Relocated Nests with Restraining Cage	0	0	0	0	0
(e) # of Relocated Nests to Self-Releasing Hatchery	0	0	0	0	0
(f) # of Relocated Nests to Restraining Hatchery	0	0	0	0	0


Additional Comments for the 2015 Season

Beach Name:

Pompano/Lauderdale-by-the-Sea

<p>Nesting Beach Management Information (e.g., predation, storms, poaching, etc.)</p>	<p>Storms - 82 nests were impacted by Tropical storm Erika: 82 washed over, 21 of which were washed out, 9 of which were reestablished, and 1 of which was relocated.</p> <p>Poaching - Three unsuccessful poaching attempts documented.</p>
<p>General Nesting Data (e.g., nests, false crawls)</p>	<p>593 total nests and 791 total false crawls</p> <p>44 ONA Reports and 72 DIS Reports</p> <p>18 missed nests, 12 associated with a false crawl</p>
<p>Nest Success Data</p>	<p>467 nests inventoried and 126 nests not inventoried</p> <p>78.10% Hatch Success and 68.51% Emergence Success</p>
<p>Miscellaneous Comments Regarding Data</p>	

Hollywood/Hallandale:

 FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION FISH AND WILDLIFE RESEARCH INSTITUTE ANNUAL REPORT FOR THE STATEWIDE NESTING BEACH SURVEY, 2015			
1. PRINCIPAL PERMIT HOLDER INFORMATION			
Principal Permit Holder:	Curtis Slagle		Permit Number: 214
Organization:	Broward County Sea Turtle Conservation Program		
Address:	590 SE 12th St., Apt. 207 Dania Beach, FL 33004		
County:	Broward	Email Address:	cs1858@nova.edu
Day Telephone (include area code):	(954) 383-2072	Night Telephone:	(954) 383-2072
Beach Name:	Hollywood/Hallandale Beaches		
Point of Contact & Phone #	Curtis Slagle - 954-383-2072	Email Address for Point of Contact: (if different from above)	
2. GENERAL SURVEY INFORMATION			
Survey Boundary Information: Please describe survey boundaries geographically. If boundaries have changed, please enter the new boundaries in the space below. <u>Be specific</u> and use known landmarks that can be found on a map (or include a marked map).			
Beginning Survey Boundary:	3.9 km S of Port Everglades Inlet (26.06043, -80.11138)		
Ending Survey Boundary:	Broward/Miami-Dade Co Line (25.97518, -80.11828)		
Beach Length: KM (miles):	9.4 km (5.8 miles)	Was this the same survey area as last year? (Y or N)	Y
IF NO, please explain the specific differences, new survey length, AND why the survey area changed:			
N/A			
Start Date of Survey (mm/dd/yy):	03/01/15	End Date of Survey (mm/dd/yy):	10/31/15
Time of Day Surveyed: Start (include AM or PM)	30 Minutes Before Sunrise (6-7 AM)	Finish (include AM or PM)	(8-9 AM)
Number of Days Per Week Surveyed:	7		
Total # of Days Surveyed in 2015 (this is the total # of days between start and end dates MINUS any missed days):	245		
If you did not survey 7 days per week throughout the nesting season, please describe your survey schedule (how many days per week, what days of the week). <u>It is recommended to adhere to a fixed schedule</u> if 7 days/week is not possible (e.g., 5 days/week every week), and these days would preferably be consecutive.			
N/A			
If you did not survey 7 days per week, how were tracks counted on the day that surveys resumed after a missed day?			
N/A			
Were all non-nesting crawls (false crawls) counted during your survey? Yes or No	Yes		
How many people were involved in surveying your nesting beach this season?	25		

3. NESTING BEACH MANAGMENT INFORMATION			
Do you collect GPS data for your nests? (Y / N)	Y	Do you save (electronic or paper files) these data? (Y/N)	Y
If nests were RELOCATED, were they relocated Individually (Ex: simply moving the nest directly landward of the original location or otherwise maintaining natural nest spacing) or in a Group with other relocated nests (i.e., self-releasing and/or restraining hatchery)?			Individually
Please give reasons for relocating nests. (Example: nest located below high tide line, in high foot traffic area, etc.)			
Nest below high tide line, donor zones designated by FWC, and/or exposed eggs.			
If a HATCHERY was used, please give reasons AND specific location:			
N/A			
Do you mark nests for inventory to determine hatching success?		Yes or No	Yes
If yes, how many nests were inventoried in 2015? (Note: data for all inventoried nests must be submitted on the Nest Inventory spreadsheet)		Yes or No	124
Do you participate in FWRI's Nest Productivity Assessment?		Yes or No	No
4. FATE OF NEST INFORMATION (for marked and unmarked nests)			
How many nests were negatively affected by predators other than humans during the course of the season? Note: this includes both partially and completely predated nests			0
List all non-human predators that were documented predated nests this season:			
N/A			
If predator control methods other than screening/caging were employed, please describe below:			
N/A			
How many nests were negatively affected by the nesting female or another nesting sea turtle?			0
How many nests were negatively affected by roots (i.e., damaged eggs, impeded hatchling emergence) ?			0
How many nests were negatively affected by erosion, accretion, inundation, and storm-related events PRIOR to hatching? Note: this <u>does not</u> include stake loss.			10
Please give details:	Ten nests experienced a wash over event. Two of the ten nests were completely washed out		
How many nests were taken or disturbed by humans (Example: nest dug into, eggs removed, etc.)? Note: this <u>does not</u> include stake removal.			0
Please give details:	N/A		
If human disturbances occurred, were they reported to law enforcement?			Yes
How many disorientation events occurred on this survey area in 2015?			15
If disorientation events occurred, have all disorientation reports been submitted to FWC? Yes or No			Yes
I certify the above information to be true and accurate to the best of my knowledge. (type in name & date)			
Curtis Slagle		Date:	11/23/15



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FISH AND WILDLIFE RESEARCH INSTITUTE
ANNUAL REPORT FOR THE STATEWIDE NESTING BEACH SURVEY, 2015**

1. PRINCIPAL PERMIT HOLDER INFORMATION

Principal Permit Holder:	Curtis Slagle	Permit Number:	214
Beach Name:	Hollywood/Hallandale Beaches		

2. GENERAL NESTING DATA for All nests on this survey area (Marked, Unmarked, & Misidentified Nests)

	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
Total # of Nests	151	7	3	0	0
Total # of Non-Nesting Emergences (False Crawls)	246	12	0	0	0
Date (mm/dd/yy) of First Documented Nest	04/17/15	05/24/15	04/07/15		
Date (mm/dd/yy) of Last Documented Nest	08/25/15	08/18/15	05/14/15		

Total # of Nests Prior to 15 May:	19	0	3	0	0
Total # of Nests After 31 Aug:	0	0	0	0	0

Comments: N/A

In the spaces below, please provide information on the initial nest treatment (e.g., in situ, screened, relocated, etc.). For example, if the initial treatment was in situ with no protection, it should be included in "(a) # of Nests left in place without additional protection" even if you later relocate the nest due to erosion.

Nest Data for nests left in place (where the turtle deposited the clutch): These nests may be left without additional protection, screened with a self-releasing flat screen, or covered with self-releasing or restraining above-ground cages.

Record the number of nests by category and species. For each species, rows a+b+c+d should equal the total number of nests left in place. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS LEFT IN PLACE (a + b + c + d)	151	7	3	0	0
(a) # of Nests left in Place without Additional Protection	151	7	3	0	0
(b) # of Nests left in Place with Self-Releasing Flat Screen	0	0	0	0	0
(c) # of Nests left in Place with Self-Releasing Cage	0	0	0	0	0
(d) # of Nests left in Place with Restraining Cage	0	0	0	0	0

Relocated Nest Data: Relocated nests are those where the clutch is removed from its original site of deposition and reburied at another site. These nests may be relocated to individual sites or as a group to a hatchery (a permanent or semi-permanent fenced or caged area where many nests are re-buried as a group). As with nests left in place, relocated nests may be left without additional protection, covered with self-releasing flat screen, or covered with a self-releasing for restraining above-ground cages. Hatcheries may be self-releasing (hatchlings escape unaided) or restraining (hatchlings cannot escape unaided).

Record the number of nests by category and species. For each species, rows a+b+c+d+e+f should equal the total number of relocated nests. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS RELOCATED (a + b + c + d + e + f)	0	0	0	0	0
(a) # of Relocated Nests without Additional Protection	0	0	0	0	0
(b) # of Relocated Nests with Self-Releasing Flat Screen	0	0	0	0	0
(c) # of Relocated Nests with Self-Releasing Cage	0	0	0	0	0
(d) # of Relocated Nests with Restraining Cage	0	0	0	0	0
(e) # of Relocated Nests to Self-Releasing Hatchery	0	0	0	0	0
(f) # of Relocated Nests to Restraining Hatchery	0	0	0	0	0


Additional Comments for the 2015 Season

Beach Name:

Hollywood/Hallandale Beaches

<p>Nesting Beach Management Information (e.g., predation, storms, poaching, etc.)</p>	<p>Storms - Five nests were impacted by Tropical storm Erika: five washed over, one of which was washed out, and 3 of which were reestablished.</p> <p style="padding-left: 40px;">Restraining Caging - Storm and high tide events resulted in multiple cages having to be removed sporadically throughout the season. Most cages were able to be replaced within three days of removal. 22 of 25 restraining cages were inventoried. The restraining cages not inventoried were either washed out or the egg chamber location was lost during the season.</p> <p style="padding-left: 40px;">Poaching - No poaching attempts documented, two nests were vandalized by the removal of stakes.</p>
<p>General Nesting Data (e.g., nests, false crawls)</p>	<p>161 total nests and 258 total false crawls</p> <p>42 ONA Reports and 15 DIS Reports</p> <p>12 missed nests, 8 associated with a false crawl</p>
<p>Nest Success Data</p>	<p>124 nests inventoried and 37 nests not inventoried</p> <p>75.02% Hatch Success and 63.72% Emergence Success</p>
<p>Miscellaneous Comments Regarding Data</p>	<p>Restraining cages were utilized as a conservation effort for local lighting issues.</p>

Hillsboro/Deerfield:

 FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION FISH AND WILDLIFE RESEARCH INSTITUTE ANNUAL REPORT FOR THE STATEWIDE NESTING BEACH SURVEY, 2015			
1. PRINCIPAL PERMIT HOLDER INFORMATION			
Principal Permit Holder:		Curtis Slagle	Permit Number: 214
Organization:	Broward County Sea Turtle Conservation Program		
Address:	590 SE 12th St., Apt. 207		
	Dania Beach, FL 33004		
County:	Broward	Email Address:	cs1858@nova.edu
Day Telephone (include area code):	(954) 383-2072	Night Telephone:	(954) 383-2072
Beach Name:	Deerfield/Hillsboro Beaches		
Point of Contact & Phone #	Curtis Slagle - 954-383-2072	Email Address for Point of Contact: (if different from above)	
2. GENERAL SURVEY INFORMATION			
<p>Survey Boundary Information: Please describe survey boundaries geographically. If boundaries have changed, please enter the new boundaries in the space below. <u>Be specific</u> and use known landmarks that can be found on a map (or include a marked map).</p>			
Beginning Survey Boundary:	Palm Bch/Broward Co Line (26.32100, -80.07447)		
Ending Survey Boundary:	Hillsboro Inlet (26.25817, -80.08043)		
Beach Length: KM (miles):	7 km (4.4 miles)	Was this the same survey area as last year? (Y or N)	Y
IF NO, please explain the specific differences, new survey length, AND why the survey area changed:			
N/A			
Start Date of Survey (mm/dd/yy):		03/01/15	End Date of Survey (mm/dd/yy): 10/31/15
Time of Day Surveyed: Start (include AM or PM)		30 Minutes Before Sunrise (6-7 AM)	Finish (include AM or PM) (8-9 AM)
Number of Days Per Week Surveyed:		7	
Total # of Days Surveyed in 2015 (this is the total # of days between start and end dates MINUS any missed days):			245
<p>If you did not survey 7 days per week throughout the nesting season, please describe your survey schedule (how many days per week, what days of the week). It is recommended to adhere to a fixed schedule if 7 days/week is not possible (e.g., 5 days/week every week), and these days would preferably be consecutive.</p>			
N/A			
If you did not survey 7 days per week, how were tracks counted on the day that surveys resumed after a missed day?			
N/A			
Were all non-nesting crawls (false crawls) counted during your survey? Yes or No			Yes
How many people were involved in surveying your nesting beach this season?			25

3. NESTING BEACH MANAGEMENT INFORMATION			
Do you collect GPS data for your nests? (Y / N)	Y	Do you save (electronic or paper files) these data? (Y/N)	Y
If nests were RELOCATED, were they relocated Individually (Ex: simply moving the nest directly landward of the original location or otherwise maintaining natural nest spacing) or in a Group with other relocated nests (i.e., self-releasing and/or restraining hatchery)?			Individually
Please give reasons for relocating nests. (Example: nest located below high tide line, in high foot traffic area, etc.)			
Nest below high tide line, donor zones designated by FWC, and/or exposed eggs.			
If a HATCHERY was used, please give reasons AND specific location:			
N/A			
Do you mark nests for inventory to determine hatching success?		Yes or No	Yes
If yes, how many nests were inventoried in 2015? (Note: data for all inventoried nests must be submitted on the Nest Inventory spreadsheet)		Yes or No	845
Do you participate in FWRI's Nest Productivity Assessment?		Yes or No	No
4. FATE OF NEST INFORMATION (for marked and unmarked nests)			
How many nests were negatively affected by predators other than humans during the course of the season? Note: this includes both partially and completely predated nests			165
List all non-human predators that were documented predated nests this season:			
FOX, RACCOON, BIRD, CRAB, AND UNKNOWN			
If predator control methods other than screening/caging were employed, please describe below:			
N/A			
How many nests were negatively affected by the nesting female or another nesting sea turtle?			4
How many nests were negatively affected by roots (i.e., damaged eggs, impeded hatchling emergence) ?			2
How many nests were negatively affected by erosion, accretion, inundation, and storm-related events PRIOR to hatching? Note: this <u>does not</u> include stake loss.			313
Please give details:	313 nests experienced a wash over event. 131 of 313 were completely washed out.		
5 of 313 were relocated due to exposed eggs. 11 of 313 nests had to be reestablished.			
How many nests were taken or disturbed by humans (Example: nest dug into, eggs removed, etc.)? Note: this <u>does not</u> include stake removal.			0
Please give details:	N/A		
If human disturbances occurred, were they reported to law enforcement?			N/A
How many disorientation events occurred on this survey area in 2015?			17
If disorientation events occurred, have all disorientation reports been submitted to FWC? Yes or No			Yes
I certify the above information to be true and accurate to the best of my knowledge. (type in name & date)			
Curtis Slagle		Date:	11/23/2015



**FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
FISH AND WILDLIFE RESEARCH INSTITUTE
ANNUAL REPORT FOR THE STATEWIDE NESTING BEACH SURVEY, 2015**

1. PRINCIPAL PERMIT HOLDER INFORMATION					
Principal Permit Holder:	Curtis Slagle	Permit Number:	214		
Beach Name:	Deerfield/Hillsboro Beaches				

2. GENERAL NESTING DATA for All nests on this survey area (Marked, Unmarked, & Misidentified Nests)					
	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
Total # of Nests	949	321	12	0	0
Total # of Non-Nesting Emergences (False Crawls)	1437	245	1	0	0
Date (mm/dd/yy) of First Documented Nest	04/16/15	05/17/15	03/23/15		
Date (mm/dd/yy) of Last Documented Nest	08/22/15	09/22/15	06/22/15		
Total # of Nests Prior to 15 May:	74	0	8	0	0
Total # of Nests After 31 Aug:	0	2	0	0	0
Comments:	N/A				

In the spaces below, please provide information on the initial nest treatment (e.g., in situ, screened, relocated, etc.). For example, if the initial treatment was in situ with no protection, it should be included in "(a) # of Nests left in place without additional protection" even if you later relocate the nest due to erosion.

Nest Data for nests left in place (where the turtle deposited the clutch): These nests may be left without additional protection, screened with a self-releasing flat screen, or covered with self-releasing or restraining above-ground cages.

Record the number of nests by category and species. For each species, rows a+b+c+d should equal the total number of nests left in place. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS LEFT IN PLACE (a + b + c + d)	945	320	12	0	0
(a) # of Nests left in Place without Additional Protection	0	0	0	0	0
(b) # of Nests left in Place with Self-Releasing Flat Screen	0	0	0	0	0
(c) # of Nests left in Place with Self-Releasing Cage	0	0	0	0	0
(d) # of Nests left in Place with Restraining Cage	0	0	0	0	0

Relocated Nest Data: Relocated nests are those where the clutch is removed from its original site of deposition and reburied at another site. These nests may be relocated to individual sites or as a group to a hatchery (a permanent or semi-permanent fenced or caged area where many nests are re-buried as a group). As with nests left in place, relocated nests may be left without additional protection, covered with self-releasing flat screen, or covered with a self-releasing for restraining above-ground cages. Hatcheries may be self-releasing (hatchlings escape unaided) or restraining (hatchlings cannot escape unaided).

Record the number of nests by category and species. For each species, rows a+b+c+d+e+f should equal the total number of relocated nests. Please check to make sure this is the case.	<i>C. caretta</i> (Loggerhead)	<i>C. mydas</i> (Green Turtle)	<i>D. coriacea</i> (Leatherback)	<i>E. imbricata</i> (Hawksbill)	<i>L. kempii</i> (Kemp's Ridley)
TOTAL # OF NESTS RELOCATED (a + b + c + d + e + f)	5	0	0	0	0
(a) # of Relocated Nests without Additional Protection	5	0	0	0	0
(b) # of Relocated Nests with Self-Releasing Flat Screen	0	0	0	0	0
(c) # of Relocated Nests with Self-Releasing Cage	0	0	0	0	0
(d) # of Relocated Nests with Restraining Cage	0	0	0	0	0
(e) # of Relocated Nests to Self-Releasing Hatchery	0	0	0	0	0
(f) # of Relocated Nests to Restraining Hatchery	0	0	0	0	0

Additional Comments for the 2015 Season

Beach Name:

Deerfield/Hillsboro Beaches

Nesting Beach Management Information (e.g., predation, storms, poaching, etc.)	<p>Storms - 214 nests were impacted by Tropical storm Erika: 214 washed over, 122 of which were washed out, 6 of which were reestablished, and 1 of which was relocated.</p> <p style="text-align: center;">Restraining Caging - Storm and high tide events resulted in multiple cages having to be removed sporadically throughout the season. Most cages were able to be replaced within three days of removal. 22 of 25 restraining cages were inventoried. The restraining cages not inventoried were either washed out or the egg chamber location was lost from Tropical Storm Erika</p> <p>Poaching - Two unsuccessful poaching attempts documented, seven nests were vandalized by the removal of stakes.</p>
General Nesting Data (e.g., nests, false crawls)	<p>1282 total nests and 1683 total false crawls</p> <p>181 ONA Reports and 17 DIS Reports</p> <p>41 missed nests, 29 associated with a false crawl</p>
Nest Success Data	<p>692 nests inventoried and 588 nests not inventoried and 2 nests pending inventory</p> <p>69.14% Hatch Success and 58.60% Emergence Success</p>
Miscellaneous Comments Regarding Data	