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Ford Island  
Honolulu, Hawaii 96818  
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### **EAST ISLAND TURTLE CAMP REPORT 2014**

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#### **I. GENERAL MONITORING**

##### **Summary**

This summer marked the 42nd consecutive field season of monitoring green turtle nesting at East Island, French Frigate Shoals. With 811 turtles identified, 2014 was the largest season on record since monitoring started in 1973. In 2013, there was no nightly monitoring due to safety and logistic concerns and so a general estimate of nesting abundance was assumed by counting pits and possible nests during the day at the peak of the season. In the 40 years prior to 2013, nightly surveys were conducted for roughly a month or more on East Island in order to estimate the nesting population.

During the 2014 field season, there were 811 nesting green turtles (*Chelonia mydas*) identified on East Island during 35 nights of census and tagging. In the decade prior, two field biologists alternated between East Island and Tern Island to maintain a constant presence on East and allow for rest periods on Tern. This year, I worked alone in 2- to 13-day intermittent shifts on East Island over the course of two months. The nightly number of turtles during the peak of the season is likely underestimated because of gaps in coverage and changes to data collection methods due to the high numbers of turtle coming ashore each night. In between these field shifts, time spent on Tern Island was used to enter and double-check data and monitor for entrapped turtles.

##### **Methods**

Nightly surveys on East Island began on June 24, 2014 and continued until August 24, 2014. Monitoring consisted of 32 full nights and three partial nights of data collection. June 24 consisted of only two walks, and was a training night. On both July 11 and July 30, the 03:00 walk was missed due to rest and safety concerns.

At 1900 every night there was a preliminary walk to map the placement of monk seals, count basking turtles, retrieve temperature data loggers, and to collect buried copper wire and washed-up fishing gear that posed an entanglement threat to wildlife. Each night ideally consisted of six walks around the island at the following times: 2100, 2300, 0100, 0300, 0500, and 0700h (sunset to sunrise). On 11 of the 33 full nights, a "new turtle walk" at 0100 was dedicated to collecting data on previously unmototooled individuals. Turtles with an existing mototool were ignored. The 0100 time was chosen to avoid missing new turtles at the peak of the night when a high number of turtles were digging. As a result of not counting previously mototooled turtles on

the 0100 walk, the number of total turtles witnessed on nights during the peak of the season is likely underestimated. The 0100 walk took place on July 12, 13, 22, 23, 24, 25, 26, 27, 28, 29, and 30.

Turtles were individually identified (mototooled=MT) with numbers 1 through 811 engraved on the 4th right lateral scute. Numbers 298 and 354 were skipped. The number 95 was used twice and corrected by remototooling one turtle with 95B. A turtle with the old mototool remnant "2" was witnessed and recorded in the data book, but not remototooled with a different number as a precaution. The concern was that the turtle was mototooled "2" in 2014 and the spray paint had worn off. A doublecheck of the data on revealed the tag of "2" was not mototooled in 2014, and so the mototool was likely a remnant from a prior season. The nesting female was identified as "2" for the rest of the season. After accounting for the two skips and two errors, 811 turtles were sighted.

### **Hatchlings**

Hatchlings were first observed on 7/13/14 and seen on subsequent nights.

### **Basking Turtles**

A peak number of 470 basking turtles were counted on June 24. A low of one basking turtle was identified on August 24.

### **Nests**

There were 520 possible nests recorded on East Island during the 2014 monitoring season. Eggs were witnessed for 172 of these. Turtles were observed covering eggs (pattycaking) for 149 nests and backfilling 199 nests. The number of possible nests was lower than in past seasons with the same number of nesting turtles because data was not collected on consecutive days during the peak of the season, but collected in intermittent shifts that lasted anywhere from 2 to 13 days over the course of two months.

## **II. GPS**

A Grey Garmin Etrex GPS unit was used for recording the latitude and longitude of nests: a point was recorded each time a turtle was witnessed laying eggs. During the 2014 season a total of 172 nests were documented and 157 corresponding waypoints were recorded. Not all nests laid have a corresponding GPS point. Some GPS points that were not recorded in the field book either because batteries went dead in the eTrex or the time did not allow for GPS to be recorded given time restraints. Unlike in recent past years, GPS waypoints were not recorded for probable nests because of time concerns.

A Yellow Garmin GPS unit was used to record waypoints for the perimeter of the island. While walking along the high water line, one point was recorded approximately every 3 to 5 meters. The maps showing the results will be used to monitor the island's shape and surface area through time.

### III. TAGGING

Internal magnetically coded passive integrated tags (PIT) were used for the 16<sup>th</sup> season at French Frigate Shoals. Each turtle without a previous pit tag was tagged in the left hind flipper if that flipper was uninjured, free from entanglement, and available. If the left hind flipper was injured, entangled, or under the turtle's shell, a tag was inserted in the right hind flipper. Approximately two weeks after insertion of new pit tags, the tag number was verified using a portable PIT tag scanner. Metal tags were also applied to select turtles at the end of the season.

Out of the 811 turtles sighted, 488 (60%) had been tagged with pit tags or a combination of pit and metal tags prior to 2014. New pit tags were applied to the left or right hind flipper of 259 turtles (32%) without previous pit or metal tags. New pit tags were applied to seven turtles (0.9%) that had existing metal tags. One turtle (0.1%) that had an existing metal tag and no pit tags did not receive a new pit tag. There were 56 turtles (7%) either not checked for tags or that did not receive new tags.

In addition to the previously mentioned totals, at the end of the season 23 turtles with pit tags were given new metal tags to make it possible for divers to identify individuals after they returned to foraging grounds in the Hawaiian Archipelago.

### IV. FP TUMORS

Of the 811 turtles, 288 were checked fully for signs of fibropapillomatosis (FP). Twenty five (9%) of those turtles had growths suggestive of the disease. The turtles were lightly to moderately afflicted, and most of the growths appeared shriveled and black or skin-colored, exhibiting characteristics consistent with regression based on samples taken in past seasons. (Spring 2006) A total of 533 turtles did not receive a full front and back scan for tumors.

Turtles identified with tumors were 3, 8, 80, 107, 117, 211, 224, 232, 254, 255, 260, 261, 285, 286, 405, 414, 415, 483, 509, 660, 663, 683, 710, 750, and 789.

### V. DATA LOGGERS

Five archival sand data loggers were buried on East Island to measure sub-surface temperatures during the nesting and hatching season. These sand data loggers were buried approximately 50 cm deep on July 11, 2014 in their historical locations. Nine data loggers were also placed directly into nests on nights between July 23 and August 20, 2014. The data loggers were left in the ground at the termination of turtle camp to be retrieved at a later date after incubation and hatchling emergence.

On August 14, 2014, four data loggers that had been deployed during the 2012 season were successfully retrieved. One data logger from a season prior to 2012 was retrieved. Two buoys were found with broken strings, but the corresponding data loggers were not found after holes were dug in their general locations. Some 2012 data loggers had buoys that were not found above the sand. Recovery efforts for these data loggers were

not undertaken as there had been a lot of recent digging, and possibly nesting, in the areas where they had been buried.

All data logger information will be downloaded and analyzed separately.

## VI. OTHER TOOLS

### Satellite Transmitter

On the night of August 15, 2014, a satellite transmitter was placed on the carapace of turtle 55 as she nested. The location of the satellite transmitter deployment was marked using the grey eTrex GPS unit, and recorded as GPS point 664. After the tag was deployed, a satellite phone call was made to NOAA scientist George Balazs, who is tracking the turtle's movement.

### Passive Satellite Drifters

After the emergence of hatchlings on July 13, 2014, four passive, solar-powered, satellite drifters were deployed in the waters off East Island over the course of the following two months. The transmitters were released in currents off East Island using a small boat. The boat was driven to a spot where the transmitters could be released without drifting back to East Island or into the shallow reef. Three drifters were released in the waters southwest of East Island. One drifter was released north of East Island. The dates, times, GPS coordinates, drifter numbers, and locations were recorded on a data sheet that was handed off to NOAA scientist Kyle Van Houtan, who is tracking the movements of the drifters.

## VII. INJURIES AND ABNORMALITIES

### Summary

There were 66 turtles with injuries or abnormalities grouped into one of three categories: flippers, carapace, and other. Not all 811 turtles were checked for injuries and abnormalities due to time constraints.

### Flipper Injuries and Abnormalities

A total of 44 turtles had flipper injuries or abnormalities. Injuries to flippers were recorded in approximate percentage of flipper missing. For the purpose of this report they have been grouped into four categories of severity: missing <50%, missing ≥50%, missing 100%, and injured (Table 2). Three turtles were missing <50% of one flipper and missing ≥50% of another flipper, and so appear in more than one group.

There were 25 turtles missing <50% of one or more of their front or hind flippers. Those turtles were mototool numbers 19, 46, 105, **200**, 211, 260, 265, 276, 277, 278, 309, **430**, 467, 483, 491, 493, **502**, 572, 574, 626, 690, 700, 750, 794, and 801.

There were 20 turtles missing ≥50% of one or more of their front or hind flippers. Those turtles were 14, 23, 31, 68, 122, 130, 138, 199, **200**, 227, 242, 244, 263, 282, 297, 353, **430**, 484, **502**, and 514.

Two turtles had "injured" flippers. Turtle 808 had a LHF that lacked solid musculature. Turtle 137 had an abnormally large scale protruding roughly halfway down the posterior side of the left front flipper.

#### **Carapace Injuries and Abnormalities**

There were 21 turtles with carapace injuries and abnormalities. Nineteen of the 21 turtles had injuries and abnormalities consistent with events including ship or boat strikes, tiger shark attacks, entanglement, and/or irregular growth. Two of the 21 turtles had scute irregularities. Turtle 561 had 6 central scutes, instead of the normal five. Turtle 615 had five lateral scutes, instead of the normal four.

Turtles with an injured or abnormal carapace were 7, 29, 34, 58, 67, 68, 131, 177, 317, 447, 459, 467, 478, 512, 561, 569, 615, 655, 703, 767, and 808. Three turtles that had an injured or abnormal carapace were also missing parts of one or more flipper. They were turtle 68, 467, and 808.

#### **Other Injuries and Abnormalities**

One turtle had an injury to her head. Turtle 196 was missing a large patch of skin on top of her head, exposing her skull.

### **VIII. ENTANGLEMENTS AND OBSTRUCTIONS**

#### **Summary**

Seven turtles (.08%) were found entangled in island infrastructure or entangled in or obstructed by marine debris.

#### **Incidents**

On July 13, nesting turtle 261 was found digging an egg chamber while entangled in a buried fishing net. Sections of the fishing net were removed from a front and hind flipper and she continued digging. After she finished and moved on, the fishing net was removed and piled up near camp.

On July 23, nesting turtle 684 was found depositing her eggs in a chamber with a plastic pipe and green net shards. They were left in the nest.

On July 25, nesting turtle 211 was found digging into a buried blue plastic laundry basket. She did not nest in this location.

On July 29, nesting turtle 603 backfilled into a buried black milk crate and light blue broken down fishing line. These and other large plastic objects collected during the season were piled up by camp so they could be removed at the end of the season.

On July 30, nesting turtle 447 was found with a copper wire wrapped around her right front flipper while digging a bodypit. The wire was cut with a clipper and the turtle continued to dig her bodypit. During the season, approximately four dozen pieces of copper wire were cut, pulled from the sand, wrapped up to prevent entanglement, and piled in

washed up baskets so they could be removed from the island at the end of the season.

One night a hatchling was found caught in a clump of washed up fishing line. The turtle was freed, the line was removed, and the animal was set down near the shore, where it scurried into the waves.

On August 14, nesting turtle 786 was found with a large fish hook embedded at the intersection between her left front flipper and her shoulder. Attempts were made to remove the hook with two pliers, but the hook was deeply embedded and the turtle returned to the water. Photos 575 to 577.

On August 24, all cables, cameras, solar panels, and batteries associated with the MTRP Turtle Cams were removed from the former LORAN telephone pole. In May 2014, USFWS and NOAA personnel had found the broken, uprooted pole on the eastern shore of the island. The MTRP Turtle Cam computer, cameras, and materials were returned to Honolulu for proper disposal.

#### **VIIII. MISCELLANEOUS**

##### **Summary**

Additional observations, ranging from barnacles to tag scars to algae, exist in the comments section on the upper part of the 2014 data sheets. Additional observations on nesting activity, ranging from dug up nests to nest GPS points to plastic exposed during nesting to dataloggers used, exist in the comments section on the lower part of the 2014 data sheets. All data will be computerized by the Pacific Islands Fisheries Science Center.

##### **Algae**

Five Algae samples were collected from Diesel Beach on Tern Island, dried, and brought to NOAA scientist Kyle Van Houtan.

##### **Bones**

Two humerus bones were brought back from French Frigate Shoals to NOAA scientist Shawn Murakawa in Honolulu. The first humerus collected came from a nesting female turtle that died in 2012 and was buried by Irene Nurzia-Humburg. The second humerus collected came from a juvenile turtle that washed up on Tern Island sometime in 2013 or 2014 and was found dead on the runway in May 2014. The humerus was collected in August. A third humerus bone was collected in September 2014 from a nesting female that died in May 2014 after crawling off the Southeast seawall on Tern Island and dropping four feet down onto metal pilings.

#### **X. OTHER ISLANDS**

Several turtles mototooled on East Island were observed crawling above the berm and digging on Tern Island during morning entrapment walks. These included turtles 309, 314, 500, 502, and 810. Not all mototooled turtles seen on Tern Island during the entrapment walks were noted. Some of these turtles were entangled or trapped in infrastructure on Tern Island. Some were given metal pit tags on Tern Island. Data on the

entrapment walks can be found in the data sheets filled out and collected for Meg Duhr-Schultz of the United States Fish and Wildlife Service.

Pit, probable nests, and basking counts were conducted on additional islands in the Northwestern Hawaiian Island chain during the *Oscar Sette* cruise to Midway in September. Summaries for those islands can be found in the report **Northwestern Hawaiian Islands Pit and Basker Counts, 2014**.

Prior to the field season, different types of data were requested. Anything that was possible given the time and resources available to a single person was collected. Going forward, plans should be made more than a month ahead of camp to address the necessary tools, time, and resources for additional data. Suggestions for future turtle camps will be made in the **2014 Turtle Camp SOP**.

#### **XI. SPECIAL THANKS**

The data gathered during the 2014 field season would not have occurred without the considerable help of the French Frigate Shoals monk seal team. In addition to their regular duties on the atoll, they helped set up, maintain, and take down turtle camp on East Island. They also provided boat shuttles to and from East Island. On Tern Island, they conducted morning entrapment walks looking for stranded hatchling and nesting turtles, cut up and moved the large pipe on Tern Island that served as an entrapment hazard to nesting and hatchling turtles, and conducted twice nightly radio calls with the biologist on East Island. The monk seal team's enormous efforts occurred despite a full week of their own work, yet they set no limits on the amount or type of help given to the turtle biologist.