

Transmitters Reveal Turtles' Way of Life

By Helen Altonn
Star-Bulletin Writer

Somewhere around Tern Island in French Frigate Shoals a green turtle is swimming around transmitting signals from an 18-inch antenna sticking up from its back.

It was one of eight turtles equipped with radio transmitters in a unique project conducted by Hawaii scientists the past summer to learn more about their activities through a tracking program.

"It was something of a first," said George Balazs, authority on sea turtles at the University of Hawaii's Institute of Marine Biology.

He said there has been little tracking work on female turtles and males have never been tracked.

On loan for a year to the Honolulu Laboratory of the National Marine Fisheries Service to do sea turtle research, Balazs teamed up with NMFS scientist Andrew E. Dizon for the tracking study.

Other participants included G. Causey Whittow, University of Hawaii physiologist, Lt. Howard Jemison and Steve Kramer, with the National Oceanic and Atmospheric Administration (NOAA), and Susan

Schulmeister, resident biologist on Tern Island.

THEY OUTFITTED the turtles — four males and four females — with specially designed transmitter packages and monitored them continuously for 20 days during their nesting period at French Frigate Shoals.

Although the work was "tedious, boring and difficult," Balazs said it revealed some fascinating information on where the turtles go and what they do in between the times that they lay eggs at French Frigate Shoals.

The group also got some answers to the long-baffling question of how long turtles stay under water — a question frequently asked by children with no ready scientific reply.

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"THERE WAS AN element of drama in this," Dizon said.

"The turtles had to stay on the surface long enough so we could do our work. We were so afraid we would just hear a beep beep and they'd be gone, or that they would stick their head out of the water and breathe like a periscope and we would never get a signal."

It was also feared that the turtles would knock the transmitters off when they scratched their backs.

The scientists tested the devices on the turtles at Sea Life Park, but there was still quite a bit of suspense when they were actually attached for the research project, Balazs said.

Balazs stationed himself on East Island for the tracking project so he could continue a turtle tagging project. This is the major nesting island for the turtles and Balazs has

tagged more than 800 turtles there during the past eight years in a research effort to learn more about the history and ecology of the animals.

He found three "familiar" turtles with old tags for the tracking experiment, including one with a history going back to 1967, when it was first tagged by a Fish and Wildlife Service scientist at Pearl and Hermes Reef.

THE FIRST OF the monitored turtles to leave the Shoals area were two males. Once a female turtle drops her eggs she isn't receptive to a male, so there would be nothing to hold the males in the area unless they were waiting for straggler females, Balazs said.

The scientists performed a mercy mission during the project — freeing a turtle entangled in a remnant of a trawler net which eventually would have strangled her.

"That's one of the hazards of ocean litter," Balazs said. "Things like that float all over the North Pacific."

Radio Transmitters Used to

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the electronics gadgetry for the project.

For example, he said, "If they spend 10 percent of their time at the surface and you count 10 turtles, it's a pretty good guess that there might be 100 turtles there."

THE TURTLES migrate annually between the main Hawaiian Islands and their breeding and nesting grounds at French Frigate Shoals—a 16-mile crescent-shaped atoll of sand islands and one rock pinnacle.

Basking on land, the females lay one to six clutches of eggs at two-week intervals, Balazs said. What they do in between those times has been a mystery. "Where are they going and what are they doing?" Balazs asked.

As it turned out, they don't go very far. Balazs said they stayed within the Shoals area. "One got close to the edge of the reef, but mostly they centered themselves around the is-

lands where they were nesting," he said.

However, one of the females did a curious thing. She was outfitted with a transmitter on Trig Island. She stayed close to Trig until it was time to nest, swam two miles to Tern Island to lay her eggs and then returned to Trig.

The night the scientists were leaving Tern on July 14, Balazs said, "We heard her signal and went to the beach and there she was nesting again."

She is the only one of the eight turtles still in the area transmitting, according to personnel at Tern Island, although the receiving equipment has all been removed.

BALAZS SAID the radio study "added a whole new dimension" to the understanding of the endangered turtles because it allowed the scientific team to monitor them in a remote area over a long period of time.

A base camp was set up on Tern

Island with a directional antenna at the U.S. Fish and Wildlife Service headquarters. A tent station with a hand-rotated antenna also was manned on East Island six miles from Tern.

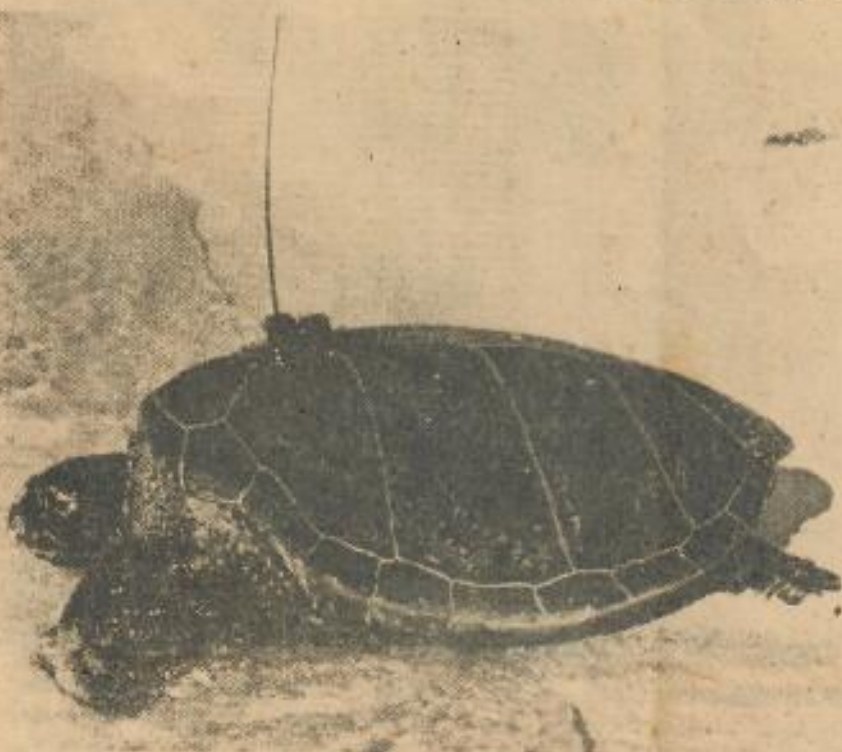
The scientists were able to get a fix on the turtles' location by forming a triangle between the animals and the two receiving stations.

The telemetry devices were produced by a company which has worked on transmitters for animals ranging from big grizzlies to small birds, but never before for turtles.

Dizon invented the mounting procedure, using shallow surgical orthopedic bone screws to hold the transmitter on the turtles without hurting them. The screws eventually were expected to fall off, detaching the equipment.

The silver apparatus was masked with roofing tar to avoid attracting predators with anything shiny.

The antennas transmitted only when the turtles were out of the



BEEPING TURTLE—Radio signals from the antenna on this turtle's back relayed its itinerary to scientists during the nesting season at French Frigate Shoals. —Photo by George Balazs.

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