ENDANGERED SPECIES

Turtle Project Can't Outrun Bureaucracy

Each winter, the world's largest population of Olive ridley sea turtles descends upon Gahirmarha beach on India's east coast to mate offshore and then come onto the beach and lay their eggs. But where these threatened creatures spend the rest of the year is largely unknown. Biologists Pamela Plotkin of Drexel University in Philadelphia and Priyambada Mohanty-Hejmadi of India's Sambalpur University had hoped to find out by attaching transmitters to a dozen nesting turtles and monitoring their movements via satellite for the next 12 months. By exploring the poorly understood migratory patterns of the Olive ridleys, the researchers hoped to learn more about their habitat and how to protect it.

But the Indian government moved at a turtle's pace in approving the project. As a result, more than 3 years after the scientists first proposed the study and 6 months after the battery-powered transmitters were built, the project seems doomed. The formidable Indian bureaucracy and fears that the transmitters would disrupt communications at a nearby missile testing site delayed approval until April, past the turtles' nesting season. Because the transmitters' batteries last only a year, Plotkin is headed to the Caribbean next month to use them on a different population, leaving behind a promising collaboration.

Ironically, this is just the kind of project representatives from 34 countries—including India—called for last month when they met in Washington, D.C., at a conference on oceans and security (*Science*, 30 May, p. 1323). Among their recommendations was a declaration that "the possibilities of satellite monitoring of the marine environment should be exploited to the full."

Plotkin and Mohanty-Hejmadi also thought the Indian government would encourage their $70,000 project, funded by the National Geographic Society and the U.S. National Marine Fisheries Service. In two visits, Plotkin says, local officials assured her of their support. This year, the Indian government passed a law requiring shrimpers in the region to install "turtle excluder devices" to prevent them from getting tangled in the shrimp nets.

Nevertheless, military officials were reportedly concerned about having scientists work in a restricted area as well as allowing radio transmitters near the missile site. The researchers did have an ally: the scientific adviser to the defense official responsible for the missile site. In January, the adviser addressed an international workshop to coordinate sea turtle conservation efforts throughout South Asia that was held in Bhubaneswar, near the nesting ground. "He offered to help in any way he could," recalls Mohanty-Hejmadi. "And I think he was able to convince the defense ministry to give its permission."

But not soon enough. Mohanty-Hejmadi says she deserves part of the blame: "I had not mentioned the timing of the batteries or the season that the work had to be done. That is my fault." Another culprit is the government's complex process for granting permission for environmentally sensitive projects. In addition, Vinod Rishi, the environmental official who issued the permit, scolded Plotkin and others for their impatience. "The moment [scientists] submit a proposal, they expect it to be approved," says Rishi.

Rishi adds that Plotkin's original proposal languished because she failed to describe the collaboration fully. (Mohanty-Hejmadi later applied separately for permission.) Plotkin is baffled by that explanation, however, saying she holds a receipt for delivery of a package of material spelling out the details of the project, and was told in January that the material had been received.

While Mohanty-Hejmadi hopes the experiment can proceed next winter, Plotkin says "if we attach [the transmitters] in December, I would only get a few months of data before the batteries run out." She says she doesn't have the stomach to raise $10,000 for new batteries, so she has turned her attention to the hawksbill turtle, an endangered species. She hopes to use some of the transmitters to collect data on migration patterns of hawksbills from U.S. waters. The Cuban government is seeking limited trade of the protected hawksbills on the grounds that its population is self-contained, and Plotkin hopes her work will shed light on that claim.

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Mission accomplished. Olive ridley turtle heads out to sea after laying its eggs.

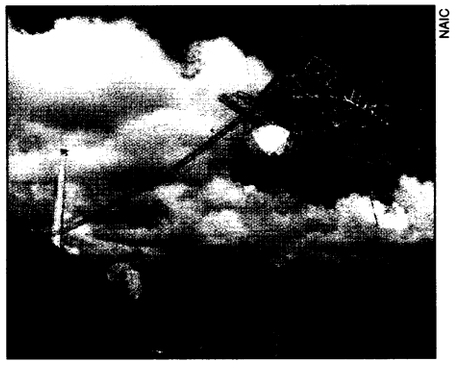
Despite her disappointment, Plotkin sees a silver lining in the Indian government's belated permission. "I guess they were finally reassured that the transmitters didn't pose a threat," she notes. "And that could pave the way for future studies using satellite telemetry."

–Jeffrey Mervis

RADIO ASTRONOMY

Arecibo's More Sensitive Eye on the Sky

In a ceremony on 14 June in Puerto Rico, technicians powered up the venerable Arecibo telescope—the world's most powerful radar and radio telescope—after a 5-year, $27 million upgrade. Arecibo's enormous 305-meter-diameter dish sits immobile in the crater of a dead volcano. The upgraded instrument features a new dual-mirror system for collecting and focusing signals bouncing off the dish. "They operate over a very wide frequency range with low loss," says Paul Goldsmith, the director of Cornell's National Astronomy and Ionosphere Center, which operates the telescope. The upgrade boosts the telescope's sensitivity by a factor of 3 or so, and it can gather data at up to 10,000 MHz, instead of the old system's 3000 MHz.



NAIC

Sharper focus. Arecibo's new reflector system.

The telescope also has a new million-watt radar transmitter, more than doubling its previous power. By bouncing radio waves off the dish and into the sky, researchers can determine the shape of distant asteroids and planets. "Now it's 20 times more capable for radar astronomy," says Hugh Van Horn, director of the National Science Foundation's astronomy division, the main source of funding for the telescope. "You can study and map asteroids in near-Earth orbit, or the rings of Saturn."

The upgrade was marred by cost overruns and delays. "It was supposed to take 20 months; it took several years longer," says Goldsmith. "It put a great burden on the scientific community." The contractor that took on the Arecibo upgrade, Comsat RSI, is suing Cornell University for $7 million over cost overruns. Comsat RSI officials were unavailable for comment. No matter what the outcome, astronomers are anxious to start getting data again. "We should start seeing [scientific] observations in the fall," says Van Horn.

–Charles Seife

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