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TRACKING THE FOREST PEOPLE

In the rainforests of Borneo, Erin Vogel '95 studies a group of orangutans in hopes of protecting this dwindling species.

At dawn in the rainforest of the Indonesian island of Borneo, an orangutan named Niko begins his day. Niko rustles about in his nest of leaves, then sets out through the trees in search of breakfast. Niko doesn't know it, but far below, from the forest floor, someone is watching.

Erin Vogel '95 slipped through the forest while it still was shrouded in darkness. With mosquitoes swarming around her and ambient sounds of the jungle as a soundtrack, Vogel has been waiting patiently for Niko to wake up. Her mission: to follow Niko and carefully document what he eats and how he spends his day. An anthropologist, Vogel studies the impact of social learning on diet selection of orangutans—how and what the great apes decide to eat.

Niko is not impressed.

"He's the most dominant male in the forest, and he shows it," Vogel said later. "Once, I had to lie on the forest floor on my stomach, covering my head for two hours while he stood six feet above me, shaking branches

and making vocalizations."

An associate researcher in the department of anthropology at University of California-Santa Cruz, Vogel spends half the year at the million-acre Mawas Reserve in central Kalimantan with its resident population of orangutans ("people of the forest" in Malay).

When in the field, she pays close attention to the diet choices that orangutans make and how these compare to the diet of populations in other sites.

Information gleaned by this research could be crucial as logging and development shrink the orangutans' habitat and as scientists—including Kalimantan researchers taught by Vogel—work to better understand

the apes and their needs. An estimated 50,000 Bornean orangutans remain, as the species continues to decline.

But Vogel's work could also shed light on human evolution.

"Erin's work, that looks at these broad, big-picture



STORY BY ADRIANA NORDIN MANAN '07

ILLUSTRATION BY ROBERT P. HERNANDEZ

"Even in a two-hundred-student class in intro biology, it was clear she was exceptional."

—Herb Wilson, Leslie Brainerd Arey Professor of Biosciences



questions across massive geographic scale, is a major contribution to animal behavior and primatology," said Nathaniel Dominy, Vogel's colleague at UCSC and principal investigator at the university's Dominy Lab for Sensory and Foraging Ecology. "Since she is in the anthropology department, it is important to relate these data to questions of human evolution, and in this regard orangutans are really interesting, as they have teeth most similar to humans among all living primates today. There must have been strong parallels between what was eaten by earlier humans and orangutans in the present, and from Erin's work we find what the exact mechanical characteristics of those kinds of food are."

Since young orangutans live with their mothers for an average of eight years, the socialization process and its role in determining dietary choices is part of Vogel's research into geographic variations in orangutan diet selection.

"Even when the same types of food are available in various sites, each population's diet is different, and we want to find out the reasons why," she said. "We're working to identify the importance of social learning in diet selection, whether they select resources based on nutritional quality or what their parents have taught them."

To do that, Vogel trails Niko through the rainforest—on a path that really began on Mayflower Hill.



The Tuanan research station where Erin Vogel '95 is based with other researchers studying the orangutans of Borneo.

Vogel's life as a scientist began when she was a Colby first-year and decided to try a class in ornithology taught by Herb Wilson, the Leslie Brainerd Arey Professor of Biosciences. "Even in a two-hundred-student class in intro biology, it was clear she was exceptional," Wilson said.

That introduction began a research collaboration that lasted throughout her remaining years on Mayflower Hill. As Wilson's research assistant, Vogel banded chickadees in Perkins Arboretum, and collaborated with Wilson on a study of sandpiper feeding habits, a project that culminated with an article they co-authored. "Working with Herb definitely turned me on to fieldwork and biology. Although I had always known that I would be a biology major, this solidified the fact that I wasn't going to be a premed major as my parents had wanted," Vogel said, laughing.

Vogel's research with Wilson on the feeding ecology of birds piqued her interest in the impact a species' food sources have on its behavior. Abroad junior year in Costa Rica, she studied primates. After Colby, she worked at a Monitoring Avian Productivity and Survivorship Program (MAPS) site in the Big Sur region of California for a few months, until a job opportunity came up in Costa Rica to study birds. It was in Costa Rica that Vogel was introduced to primates, and by the time she was applying to graduate school she knew that she wanted to study birds or monkeys.

Ever the protégé, she consulted Wilson about her decision to discontinue her study of birds, slightly apprehensive that he might be disappointed. He laughed when reminded of the conversation, in which he told his former assistant he was thoroughly pleased that she was continuing her work as a field biologist. With that encouragement, Vogel enrolled in a master's program at SUNY Stony Brook in 1997, switching to a Ph.D. program a year later. The subject: the ecological basis of aggression in white-faced capuchin monkeys in Costa Rica.

Capuchin monkeys led to orangutans. Orangutans led to Kalimantan. The science path is direct. The route to the rainforest is long and arduous. As Wilson puts it, "It takes a special person to work in



Erin Vogel '95 in the rainforest where she tracks orangutans to study their diet and habitat.

the tropics.”

Vogel flies to Jakarta, then to Palangkaraya, is driven five hours (mostly off road) to the Kapuas River. A five-hour river trip ends in the small town of Pasir Putih, next to Tuanan, where the base camp is located.

Built on stilts, the base camp can house 25 people, though the norm is to have around 15 from Europe, the United States, and Indonesia.

The Tuanan research station is located within the Mawas Reserve, a territory managed by the government of Indonesia and the nonprofit Borneo Orangutan Survival Foundation (BOS). Vogel was invited to work at Tuanan through her colleague Carel van Schaik of the University of Zurich. Van Schaik is a leading authority on orangutan behavior and conservation, especially in the Indonesian regions of Kalimantan and Sumatra. While van Schaik and his colleagues take charge of the research that goes on in the site, BOS protects it from illegal loggers and carries out reforestation efforts around Tuanan. Vogel herself has instructed a dozen students from Indonesia, the United States, and Switzerland on data collection methods.

Vogel and her colleagues make it a point to involve



JIP



We observed Jip's birth on Feb 14, 2006. This was the first birth observed at the Tuanan field site since we began there in 2003. Jip will remain with his mother, Juni, until he is approximately 7-9 years old. Juni is a master at finding termites in dead trees and pushing the trees over to get them out.



NIKO



Niko is approximately 20 years old and is the dominant male in our forest. He spends most of his time giving long calls and patrolling the forest, and the females. He has been the dominant male since we started working in Tuanan. He weighs about 350 pounds. Niko, at times, has been known to chase after researchers. We try to keep our distance.



JERRY



Jerry is approximately 4 years old. He was a newborn infant when we started our research at Tuanan. His mother is Jinak, and if we are correct, his sister is Juni and that makes him Jip's uncle. Jerry is our most curious orangutan and often tries to get too close to us, so we have to be very careful and back up when he gets too close.

"Each time [loggers] bring us the babies we tell them that we cannot pay them and that they could go to jail. We give them gas money and offer them food, because that's common courtesy."

-Erin Vogel '95, associate researcher in the department of anthropology at UC Santa Cruz



Indonesian students in their projects. "For each international student that comes here, we pay for an Indonesian counterpart," she said. "Otherwise, they would not be able to afford this kind of research." Thanks to a National Science Foundation grant awarded in 2007, Vogel will soon be able to bring in at least five students from Indonesia and the United States to work with her in Tuanan and other sites on the neighboring island of Sumatra.

Collaboration with the host society extends to work with Indonesian academics, primarily from the national capital, Jakarta. Vogel collaborates and co-publishes with two experts on primates from the National University (Universitas Nasional), and whenever she is in the country she gives talks. Familiar with the pressing circumstances the great apes are in, she is hopeful her research will contribute to the ongoing effort to save the orangutans.

"If the rate of deforestation continues or even decreases slightly," Vogel said, "orangutans will be extinct in fifty to a hundred years. We don't have a



Anthropologist Erin Vogel '95, sitting at center, with fellow researchers at Tuanan research station in the Mawas Reserve in the Kalimantan region of the island of Borneo.

lot of time left, and I'm hoping that our research will allow us to understand the most important factors of diet selection and what plant species we need to focus on when carrying out reforestation work."

At her base camp, Vogel is frequently reminded that the illegal destruction of habitat continues. Loggers occasionally come to the researchers with baby orangutans. The mothers have been killed. The loggers are looking to trade the baby apes for money.

"Each time they bring us the babies we tell them that we cannot pay them and that they could go to jail," Vogel said. "We give them gas money and offer them food, because that's common courtesy. Plus, you're never rude in Indonesian culture and must always keep your cool and talk to people with respect even if you don't actually respect them."

She is conversant in Indonesian and well aware of the choices the locals have to make in order to make a living. All the local assistants at the station are former loggers.

"If they weren't working with us they'd be logging, because that's their only means, and I understand that. They need to survive, so we're trying to provide them with other opportunities. Between our project and Mawas, we have about twenty to thirty locals working for us," Vogel said.



JUNI



Juni is an adult female who we estimate to be between 10 and 12 years old. She gave birth to her first offspring, Tip, in February 2006. We think she is Jerry's older sister, but we are currently doing the genetic work to verify this.

Despite the dire predictions, working with orangutans is not a grim business. “There is Jerry, a four-year-old who is very playful and interested in us,” Vogel said. “He is definitely the funniest orangutan we have. He still lives with his mother, Jinak, and plays with his sister, Juni, who has her own baby, Jip. Jerry is really interested in and tries to touch us and the cameras. The rule is to stay away from them, to avoid changing their behavior, and to just be able to observe them.”

Vogel’s days with “the people of the forest” begin at 3:30 a.m. After walking to the orangutans’ nests from the base camp, Vogel waits for about half an hour until the orangutan to be followed that particular day rises and begins searching for food. She follows one individual throughout the day, as orangutans are solitary animals, a practical choice since most trees would not be able to provide enough food for larger groups. There are exceptions to this however, when orangutans get together in the trees and have what Vogel calls “parties.”

“Sometimes, in the big feeding trees, networks of females come together,” she said. “You can sometimes have two females with their infants, and when the infants get together they’re very happy. You can just tell that they’re going ‘woohoo!’—ruffling trees and playing for hours while their mums sit and eat.”

For orangutans, parties are an important form of socialization, Vogel said.

“Unlike other primates, female orangutans don’t groom. They tolerate one another and sometimes rest and stay close together, but they don’t groom. You sometimes find females and male parties, or even with two females and a male, but rarely one where males come together.”

The reason for this is the sexual competition among males, especially between the dominant flanged (“moon-cheeked”) orangutans, with prominent cheek pads like Niko’s, and smaller unflanged ones. In parties where unflanged males are in the company of females, the sight of a flanged male will send the unflanged males running, Vogel said.

Orangutans’ daytime naps, complete with quickly fashioned mini-nests, leave Vogel no other choice but to take a short siesta herself. Unrolling her hammock, she ties herself a resting spot that keeps her dry, away from the swampy waters below.

“Sometimes I bring a book or just sleep myself,” Vogel said. “You need to be able to sit down when you’re out for twelve to fourteen hours a day. The mosquitoes are horrible, and DEET is the only thing that works. There have been cases of malaria among the researchers before, but you get used to the mosquitoes—eventually.”

A study of food would not be complete without taste testing, and study of orangutan diets is no

exception. Vogel does not hesitate to eat what the orangutans do (though she draws the line at meat and insects), figuring that what is safe for an orangutan will be safe for people as well. “Humans are so similar to them, and they’re much bigger than we are. If they can tolerate the food, then we should be able to.”

When the orangutans are not in the trees, assistants—one on the ground and one in the trees—collect food samples. Orangutans also are sloppy eaters—and Vogel tastes things that fall to the ground (mostly fruit and plant shoots).

“Sometimes [the food] tastes really horrible and leaves a bad taste in your mouth, but I’ll try it anyway,” she said. “I won’t eat a lot of it though, unless it tastes good and I’m hungry.”

An eating orangutan above can be trouble for anyone standing below. Food that is spit out by orangutans tends to be high in tannins and alkaloids, leaving a very bitter taste. Some of plants are related to poison ivy and poison oak and can burn one’s skin and even dye it black. People have allergic reactions to some of the fruit, Vogel notes, and form blisters that can fester in tropical weather.

In other words, Vogel’s job is no stroll through the rainforest. “Sometimes when I’m waist deep in swamp water and I’m sweating and covered with mosquitoes and my fingernails are full of dirt and I’m tired and miserable, I think to myself, ‘Why do I do this?’” she said. “Then I realize that this is what I love, and when I am in the forest I am most at peace and content.”

“People don’t go into academia for the money, and I think of this as a really wonderful way to give back to society. I really like mentoring students, and if I can turn someone on to science and to primates and orangutans then I’m doing my job. If I can make a difference as far as saving some of these highly endangered species, then I am doing something right. So, really, I’m out there to make a difference, and that’s what I want to do.”



KONDOR



Kondor is approximately 6-8 years old. She is at the age when she should be dispersing from her mother, Kerry. Usually, when mom gives birth, the older offspring disperses on her or his own. Soon Kerry will force her to disperse. Kondor still relies on her mother to push over dead trees for termite foraging, one of the hardest skills to acquire.