

DR. BILL KARESH: VETERINARY CONSERVATIONIST

It is a crisp, early Fall afternoon at New York's Bronx Zoo. Veterinarian Bill Karesh leaves the Animal Health Center carrying an equipment box full of tools and medical supplies. He makes his way past a pasture that's home to several exotic wild horses, turns down a lane marked by two large bronze rhinos, and heads toward the elephant habitat. Tess, the zoo's 35-year-old female, has a nagging toe infection he wants to check. "It's the sort of injury that looks minor," he explains, "but if it reaches the bones of her toe she'll go lame, and elephants generally go downhill from there."

He enters the habitat through a green metal safety door and signals the handlers to bring Tess over. She is huge and beautiful, with sparkling deep brown eyes. Dr. Karesh strokes her trunk, then kneels beside her and encourages her to lift her infected foot onto a small metal stool. She does what he asks and he begins his examination. Karesh's fearlessness in working with the large animal is immediately apparent. He examines the elephant's foot with the same detached interest another doctor might use when examining a human patient. "It's not good," he tells the handlers after a few minutes. "I'm going to have to do a little cutting."

Asked if he's going to give the elephant an anesthetic, he says no, that a general would be too dangerous, and a local might leave her foot numb, causing her to fall after he's finished.

The handlers, holding short, pointed poles to control her if she becomes threatening, feed Tess apples and carrots to keep her occupied as Karesh starts to work. Using a curved hoof-knife he probes the injured area and begins to cut away the infected tissue. His hands are thick and strong, more like a laborer's than a surgeon's. He wields the knife deftly, but the elephant's wound is deep and it's clear that Tess finds the procedure painful. She lifts her trunk and bellows, and the handlers have to use their poles to restrain her. The poles are more suggestion than physical threat, but they seem to calm her down. Karesh, engrossed in his work, hardly notices. A few minutes later she bellows again and for a frightening moment it looks as though she might step off the stool and onto his legs. Without breaking his concentration, he quickly shifts his feet so that he can get out of the way if she does. It is the only concession he makes to the potential danger of the situation.

For half-an-hour he continues to work, probing, cutting, cleaning, and finally, loading the infected area with topical antibiotics. When he's finished he stands and strokes Tess's trunk reassuringly, then promises to look in on her again in a couple of days.

For most zoo vets, working on captive animals is the norm; for Karesh it's the exception. As head of the New York Zoological Society's (NYZS) International Field Veterinary Studies Unit, he spends the better part of each year with wild animal populations at remote sites around the world. Since the program's inception in 1989, he's made nearly two dozen trips to 11 countries on three continents, collecting material on wild animal nutrition, genetics and diseases, and contributing to field biologists' work with peccaries, tapirs, fur seals, golden jackals and a host of other exotic species. He's assisted pigmies in trapping forest antelopes in Zaire, released endangered parrots in Venezuela, crawled to within 30 yards of herds of rhinoceros, and been charged by angry elephants. It's not the sort of job most people would want, but it suits Bill Karesh just fine.

"It's what I wanted to do all my life," he says on the way back to his office. "I grew up watching Wild Kingdom and thinking I wanted a job like Jim Power's."

Sitting in his office, a small, austere corner room in the Animal Health Center, the 38 year-old, bearded Karesh says that while he always loved wildlife, he never intended to become a veterinarian. So how did he end up as the head of the Field Vet program?

"It's a long story," he laughs. "I started out very young working with wildlife. I was raised outside of Charleston, South Carolina, and we always had orphan wildlife around the house. You know, squirrels, raccoons, birds. I really loved it."

By the time he got to college, however, he got sidetracked into business engineering for a couple of years before changing his mind and going into zoology, so that he could work with wildlife again. But while he was applying for graduate school—he was planning to get a doctorate in wildlife biology—Karesh got a job with the National Zoo, doing behavioral research. While there, the head of the research department urged him to go vet school instead, which he did. "But I wasn't interested in anything I saw as the traditional vet role," he says. "A professor might be discussing infectious diseases in dogs, and in my mind it would be infectious diseases in all canids. I'd try to plug that information into a multi-species approach, making little notes in the back of my mind for when I got a chance to work with wild canids in Africa..."

After graduating in 1982, Karesh landed his first veterinarian job at the San Diego Zoo, where he was responsible for the health care of more than 800 species in the zoo's collection. "That really was the lucky break that got me back into the wildlife business. There are only a couple of jobs like that in the country."

After two years at San Diego, he took moved on to Seattle's Woodland Park Zoological Gardens, where his responsibilities included the operation of the Animal Health and Research Department and the development of new programs. It was while he was at Woodland that Karesh cut his teeth on overseas field work, with a trip to Madagascar to provide wildlife management and medical consultation for conservation projects there. That trip was followed by the development of the first overseas project in which he took the lead role.

"We wanted to look at the genetics of wild orangutan populations in Sumatra and Borneo," he says, "which we felt was important because zoo breeding programs were interbreeding different subspecies, making hybrids. And no one had ever looked at those populations' genetics before, despite historical literature suggesting that there might be as many as a dozen subspecies of orangutans on Borneo alone."

The reason the project had never been done was that there was no safe way to secure blood and tissue samples from the animals. "The

traditional technology of darting them with medication to knock them out was out of the question," Karesh explains. "It would make them fall out of their trees. And making an animal fall 120 feet is the wrong way to get a blood sample."

Karesh's solution to the problem was to invent a new technology, the biopsy dart. The dart, a modification of a standard drug-dart, has a razor-sharp cookie cutter tip instead of a needle. The K-dart, named after Karesh, is used in the same way as the standard drug dart, but instead of delivering medication, the K-dart's hollow tip pierces the animal's skin, and two small barbed pins grab hold of a bit of the animal's tissue. When the dart is either removed by the animal, or falls out on its own, the tiny tissue sample comes out with it.

But inventing the dart—which he tested in the zoo to make certain it worked and wouldn't injure the animals—solved only one of the project's problems. "The geneticists said the dart would be useless because we weren't getting a sterile sample and we weren't getting it fresh enough. So we also had to develop a way to freeze the sample, which meant carrying liquid nitrogen to the collection sites.

"Then, since I didn't want to spend three years in the field collecting samples personally, it seemed smarter to tie in with researchers who were already there. So I started making contact with them and establishing relationships with the local governments."

Convincing established orangutan researchers that the genetics project was important enough to warrant their participation required a considerable amount of ego balancing. And they weren't the only ones who needed stroking. The governments involved felt that they were the key participants, that it was really their project. "What we ended up doing," he says, "was hooking up with a university there and having them say it was their project, with the researchers getting acknowledged for their help."

Two years after he began, his work finally paid off and in 1988 Karesh began his first orangutan genetics study on Sumatra. Perhaps even more important than the study itself, however, were the lessons he'd learned in getting the project off the ground, from the need to be willing to invent technology when necessary, to learning how to gain the trust of researchers and foreign governments.

Additionally, it established Bill Karesh as the sort of creative problem-solver that the New York Zoological Society was looking for to head up its new Field Vet program.

"The reasons I hired Billy," says Bob Cook, chief veterinarian for NYZS, and the man who hired Karesh, "were that he had both zoo and field experience, and because his ideas on where he saw field veterinarian medicine going were very similar to my own. We both wanted to take the expertise of wildlife health care that we practice in zoos and focus that internationally, to provide the same high quality of care to animals whether they are in captive or free-ranging environments."

The Field Vet program, the first of its kind, was the brainchild of NYZS director William Conway, and the society's late chief veterinarian Emil Dolensek. Their intention was to provide veterinary services to the society's field division, Wildlife Conservation International (WCI), which frequently has more than 150 field biologists working worldwide at a given time.

"The thought was," Karesh says, "that a lot of field biologists were doing things on their own, and that they should have a vet's help."

Veterinarians have traditionally been utilized by field biologists primarily to ensure animal safety during translocation, but the Field Vet program offers a new dimension in animal health care. "There's no other program like this based in a zoo. The advantage of that is that we're able to utilize all the resources of the zoo and apply them to this new endeavor. Other zoos will send their vets overseas to do projects, but nobody has a program whose prime mission is to enhance conservation programs."

Unfortunately, many people initially see Karesh more as a threat to their work than an enhancement. Asked why that is, Karesh thinks for a moment before answering.

"Part of it's territorial. If you get your PhD in wildlife biology and set up a deer study, why would you want a vet to come in and do the fun part, the animal darting? Another part of their resistance comes from thinking we hamper them. If a vet gets involved in a project they're going to make sure it's done with the best interests of the animals in mind. Which is threatening to people used to doing things their own way.

"Take field anesthesia. People without the proper training in anesthesia lose a lot of animals. Even with a vet's help you're going to lose some. But if you have a vet involved you also find out why the animal died. We can do a postmortem and tell you what the problem was, so that you might be able to avoid it in the future.

"The thing is, as vets we not only have the skills to develop the techniques to make it safer for animals to be studied, we have the motivation. If you're a geneticist, you put your energies into genetic discoveries. But animals are our field, so we're obligated to find better ways to do these things. It's in our oath."

As with the orangutan project, convincing researchers he's there to help is one hurdle, convincing governments is another. "No government is going to let you go ahead with a project unless they see you're going to help them in a way that's not going to embarrass them. And since I'm from a zoo but I'm not collecting animals, there is generally some question as to what the hell I'm really doing. So it's only after I convince them that I'm getting enough benefit out of the equation through career enhancement that we begin to establish trust and can move on. And a great deal of my work is based on trust and personal relationships."

The trust he's worked to build has already begun producing dividends: when he returned to Borneo and Sumatra in 1990 and 1991 to complete the orangutan genetics study, both the Indonesian and Malaysian governments asked him to provide them with medical and animal management consultation. Additionally, he was asked to develop Indonesia's first wildlife disease and management training

course—taught by Karesh and Bob Cook—for Indonesian wildlife veterinarians. And during a 1992 trip to the region, the Malaysian Wildlife Department asked him to draft official policy on procedures related to the care, handling, and transport of wildlife.

All of which fits perfectly with where Karesh sees the program going. “Basically, I was hired to create something,” he says. “So the first thing I did was look at all the WCI projects. And once we began actually working with the field biologists we saw there were a lot of ways a vet could fit into existing programs. It wasn’t just that the staff at WCI needed help catching animals to put radio collars on them—though that’s a part of what we do—but we got involved all over the world, helping a variety of people deal with issues of wildlife diseases, and how they impact conservation programs.”

Each of the projects Karesh enhances develops in its own way. A trip to Kenya to train a WCI researcher in the use of the K-dart biopsy system produced skin samples from 34 elephants that will be used to develop forensic techniques to identify the geographic source of illegally traded ivory. A request for immobilization needles from a researcher in Peru resulted in Karesh’s joining the project to take blood and tissue samples in the first disease surveys ever done on the southern fur seal.

In 1990, a simple request to assist WCI field biologists John and Terry Hart in replacing a radio collar on an okapi—a forest cousin of the giraffe—in the Ituri forest in Zaire developed into several projects. “While I was there I learned they were going to put radio collars on some duikers—forest antelopes—they were planning to catch with the help of the local Mbuti pigmies. I suggested that as long as they were going to catch them anyway we should take some samples of other things, and answer questions about diseases, population dynamics, nutritional needs, parasites, and so forth. So while they were perfectly happy to do the project without my help, I think my presence greatly enhanced the amount and quality of data they were going to get.”

Word that a field veterinarian was in the country reached other researchers there, and Karesh was soon asked for his help in immobilizing some chimpanzees so that they could be moved to an island habitat. Then wildlife filmmaker Alan Root asked Karesh to take a look at some of the animals he was working with. “And some people up at Garamba National Park asked me to take rhinoceros tissue samples for a genetic study, and then they had some elephants they needed immobilized, so suddenly there are four or five projects going on, just because I went over there to put one collar on one okapi.”

Asked what it’s like to crawl close enough to a rhinoceros to fire a K-dart into its hide, Karesh grins. “You’d be surprised by how large adult rhinos look when you’re on your hands and knees 30 meters away from one. You take your shot and just pray they run away from you.”

When he speaks about creeping up on rhinos, it’s apparent that he loves the rush of adrenaline that fear produces. Not surprising. Work in the field requires someone who’s tough enough to handle themselves in a variety of precarious situations. “There’s an element of danger involved anytime you work with wild animals,” he says plainly. “There’s always the chance that this trip, this animal will kill you.” Which nearly happened on a trip to Cameroon in 1990 when he was charged by an elephant he was trying to immobilize. He was saved by hiding behind a stout tree, and though he laughs about it now, his trip notes, written at the time of the event, suggest it was no laughing matter. “The fun of thrill seeking,” he wrote, “is based on testing your wits or skill against an extreme challenge. Much of this is lost when you no longer have any input into determining the outcome...Is this really worth it?” I asked myself. Travelling and working in the bush is inherently risky...but to place myself within a couple of meters of a pissed-off elephant with no escape seemed way beyond this job.”

His unwritten answer to the question of whether it’s worth it is obviously yes. Karesh is, after all, a thrill seeker, whether it’s his work in the bush or sky diving, or bungee jumping. “I really do love adventures,” he admits.

His toughness doesn’t go unnoticed by the people he works with. According to NYZS director William Conway, it’s one of his outstanding job qualifications. “What he does in the field is pretty bloody tricky,” Conway says. “We have had some close calls and we were worried about that. We wanted a man who was not going to make risks but when the risks came as a normal part of the work would come out of it okay. One of Billy’s great adaptations is that he is an extraordinary athlete. He can climb trees, is capable of trekking in the worst of places carrying heavy loads, and he can run like hell if he has to.”

The phone rings. Someone from the zoo’s reptile house asks him to come take a look at a viper that’s been refusing to eat. He says sure, and moments later is moving through the mysterious world of the zoo’s back doors, where the handlers, veterinarians and scientists work. Though making rounds is not his prime responsibility, Karesh says that the hands-on work he does at the zoo keeps him in practice and provides him with the confidence to work with animals in the wild.

The room where the snakes needing medical attention are kept is hot and humid, almost steamy. The animals, perhaps a dozen of them, are in mesh-covered, glass aquariums, their medical histories noted on nearby tags. The African Viper Karesh has been called to look at is suffering from a small necrosis of the skin. The handlers are wary of force-feeding her since she’ll only regurgitate the food. Karesh lifts the snake from the aquarium gently but firmly and turns it over. Probably due to its illness, the viper allows itself to be handled, though it’s certainly capable of striking. Karesh makes a brief examination of the necrotic area, then returns the snake to its aquarium. He asks the handlers for their recommendations and decides to go along with the therapy they suggest.

Back outside, he’s asked about letting the handlers suggest the viper’s therapy. He says it’s important to trust the knowledge and intuition of the handlers, as they’re the people in daily contact with the animals. It’s the same attitude with which he runs the whole Field Vet program: Everyone connected to the Zoological Society contributes to its success, from the machine shop workers who modify his field

equipment, to the zoo's other veterinarians who have particular animal specialties.

Under Karesh's guidance, the program has developed in three primary areas: it provides a service to field biologists; produces research on wildlife diseases and how they apply to conservation; and runs training programs for veterinarians and animal health care workers overseas. Additionally, the Field Vet program integrates formerly separate sciences by looking at the entire field of wild animal health care within the context of conservation, providing, for the first time, an overview of what is happening with those populations in a world where the human population is growing, and animal habitat is shrinking.

"The next step for the program," he says, walking through the zoo grounds, "is that we need more vets involved, because I can't do all of this alone. I don't mean the other vets at the zoo, they've already done some field work, and we're already considering hiring another full time field veterinarian. But I should have some vets from Zaire involved who can help, just like there are now some vets in Indonesia who've had some field training. I'd like to get to the point where we can train foreign nationals who can eventually become self-sufficient. Or at least primarily self-sufficient."

But wouldn't that mean he wasn't needed anymore?

"My opinion is that with everything we do we should strive to make ourselves obsolete. We'll never get anywhere if all we do is make ourselves indispensable. I'd rather go in somewhere, train people, and after a few years work no longer be needed. Take geneticists: Rather than demanding that they all have a vet working with them to get genetic samples, my approach was to devise a system where they could safely get the samples on their own. The biopsy dart. It worked. Now I'm obsolete."

With so many new wildlife problems cropping up, however, Karesh doesn't really see himself becoming obsolete no matter how hard he tries. He stops by one of the Zoo's African habitats, where several species of large birds and antelope move about on an open savannah dotted with trees. One of the birds, the Secretary, has a beautiful quill comb. Karesh says that the bird was almost hunted to extinction at one time because its quills were so highly valued as writing implements. Asked if his work extends to protecting animals from that kind of destruction, he says that in the final analysis, protecting animals from poachers is as much a part of his work as doing genetic studies.

"My role is to do whatever it takes to help save wildlife populations. If that means cutting off rhino horns to stop the poachers, then that's part of what we do. But wildlife conservation is so site specific that programs must be developed for each particular site, depending on the needs and capabilities of the local people and government, and what the species can and can't handle. So while cutting off rhino horns works in open areas where poachers can see the animals, that solution won't work in forests, where you'd just end up with a lot of dead, hornless rhinos. And you can't do that for elephants, because the tusk is a living tooth. For them you'd have to do root canals, and you just couldn't physically do root canals on every wild elephant.

"But what you could do for elephants, in the US for example, where the demand for ivory represents 30% of the world's demand, is public education. Dropping 30% of the world market would have a significant enough effect on the price of ivory that it might no longer be worth it to the poachers and dealers. In Asia though, public relations campaigns don't have the same impact, so you have to come up with something else there. And how do you stop the decimation of elephants in the Kora region of Cameroon, where the locals are poaching two or three every week for food?"

While Karesh understands the limits of public relations, he also recognizes it as one of the vital tools at his disposal. He recently made a trip to Venezuela to be present at the release of eight endangered Marguerita parrots that were confiscated by the government from illegal exporters. "It was only eight birds," he says, "but the government played it up for publicity, getting the national media involved. We're hoping that by increasing awareness we might lower the demand for buying these birds as pets, making the spillover effect greater than the impact of the release itself.

"I've got a similar media-oriented project I want to do in Indonesia that I call the Disease Market-Survey. It's based on something I heard when I was last there. There were some orangutans confiscated in Taiwan that were sent back to Indonesia, and one of them turned out to have hepatitis and test positive for TB. The local paper picked up the story and the next day 50 baby orangutans were turned into the government by people who had them illegally as pets.

"Anyway, I realized that if I can show that a lot of the meat and game sold in the markets there, like turtles and monkeys, are also carrying disease—which I think they are—and that information reaches the press, there might be a reduction in the demand for that stuff, decreasing the hunting pressure on those animals. I don't mean the hunting done by the indigenous people to feed their families, I'm not worried about that. But the indigenous people have begun destroying whole wildlife populations because of market hunting, bringing the animals out to middlemen who bring them to urban areas for sale, and that's devastating entire species."

Karesh's disease market survey concept—like the K-dart, which is now used all over the world—is the kind of breakout thinking that marks the whole Field Vet program. "My personal fixation is to try to keep doing things a little better. If we're going to immobilize an animal, and I did it last year and it worked but wasn't great, then I'll try to do it a little better this year. And coming up with those ideas is a team approach. A lot of people contribute to the idea, and then we try it at the zoo.

"It's really one of the fantastic advantages of the program being zoo based. When I go overseas to work in the field, we're not inventing procedure, we're already comfortable with the procedures based on our experience and experiments. Here in the zoo I can do hundreds of immobilizations, get my hands on the animals, do physical exams, and learn what's normal for a given animal. And if

there's a new antibiotic introduced and we think it might be better for some particular thing, we can try it here. That's something we simply couldn't do in the wild because we couldn't follow up on the animals to see how it worked.

Plus, at the zoo we have so many people as a resource to call on. For instance, I'll be working with penguins soon, and before I go I'll call someone who's working with penguins and find out what they're doing now, so that I'll be prepared. What it comes to is that the animals in the wild are not being used for practice.

Though the program is still new, it has had several enormous successes: The duiker and fur seal disease studies are painting the picture of what the needs of those animals are, and several similar studies are either planned or underway. The use of the K-dart to take samples from orangutans, elephants, rhinos and other big game without immobilizations are also firsts. And Karesh and his colleagues are currently working on several new technological ideas to make field work safer for animals.

The program's biggest success though, may be its residual effect of bringing people from different disciplines together, he says. Because to get the kind of work done that I think needs to be accomplished requires different disciplines to work together. When I was down in Venezuela recently I brought together conservation groups, biologists and local veterinarians. Those people have a tremendous amount of skills and expertise to provide. But the resource of them working in conjunction rather than independently had never been tapped into. And now that it has it's obvious to all of them how much benefit they can provide one another. I won't take credit for it, but it's a by product of the way we approach things here, and when we export that overseas, people see that it's a great approach.

There have been failures as well, despite his efforts. He lost an okapi in Zaire when it choked after darting, and an elephant which had been darted with medication ran out of range of his team, leaving it immobilized and vulnerable to predators when it couldn't be found. Each of those losses is crushing to Karesh. Any time you lose an animal you're trying to help, he says, it's devastating. The losses only make him work harder.

There are also several new projects he hasn't yet been able to get a handle on. One is the controversy over the impact of eco-tourism on mountain guerillas and the risk of giving the guerillas human diseases. We haven't yet figured out how to monitor those populations, he says. Everybody's nervous about immobilizing them or using the K-dart because you'd risk making them scared of humans and then you won't be able to bring tourists there anymore. Or they might get angry and attack a tourist, ruining the entire program. While getting those disease samples hasn't yet been solved, Karesh has begun thinking about new ways—a leech that would take his samples for him, without endangering the animal, perhaps—to get the work done.

Then there's the flamingo project he'd like to do. It's my dream project to do something with the flamingo populations up in the high Andes. They're up at about 14,000 feet above sea level in these isolated lakes in the mountains. Nobody's ever done a health assessment on them. I've been hoping to do it for a couple of years but I haven't figured out how to do it yet.

Until he does his schedule is full: after his penguin study he's off to Tanzania to work with WCI biologist Patricia Moelman who's studying jackels in Tanzania. Then the Indonesians are having a meeting about orangutans he'd like to attend, and he's also supposed to work in a trip to Bolivia to continue a tapir project there.

Asked whether he ever gets tired of the field work and the travelling, he grins. No way. I love being in the wild. I'm happiest when I'm outside. This is what I've wanted to do for 30 years, and now that I am, I figure I'll be doing it for quite a while.

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SIDEBAR:

DR. WILLIAM CONWAY, DIRECTOR OF THE NEW YORK ZOOLOGICAL SOCIETY, ON THE CREATION OF THE NYZS FIELD-VETERINARY PROGRAM

All over the world today, ecologists, ethologists, and biologists are focusing on the problem of reducing the loss of wildlife. Yet there are overall factors beginning to affect that loss that are new. Habitat destruction is not new. Over hunting is not new. What is new is the extraordinary fragmentation of wildlife habitat.

In the space of the last 90 years we've gone from a time when human beings were surrounded by wildlife to an era where human beings surround wildlife. Increasingly, wildlife exists in islands of habitat. Often, populations are very small, and sometimes, because of hunting pressures and other pressures, crowded into remarkably close quarters. These kinds of events are tailor made for tragedy. They are tailor made for

the advent of disease to become a major factor in wildlife extinction. And there are no instances of veterinary scientists out there looking at disease as a major factor in extinction for the future.

“We don’t know what is normal for most of these populations. We don’t know what their normal parasite and bacterial loads might be, or what their living conditions are. We don’t know what to expect when they’re overcrowded, when they’re stressed by the problem of too many animals in one place or the inability to migrate as they used to.

“So what we’re trying to do with the Field Veterinary program is to begin to form the picture of what is happening out there, and to address some of the emergencies which are occurring. It is necessary to find out what is happening with wild populations and to develop norms to work from. It’s important to teach veterinary scientists in less developed countries how to recognize disease problems and call for help, and for themselves address many of the local problems.

“It is a broad vision that is perhaps for the first time making veterinary science an expeditionary science, and a part of the arsenal that conservation biology has to address the decimation of wildlife that is occurring all over the world. So we are trying to forge a new way to arouse interest in this area, and by example encourage others to move into it rapidly so that we can deal with the problems that are arising. We no longer have populations of hundreds of thousands or millions of animals to deal with. If we really want to prevent extinctions we have to be very sensitive to small, individual populations, not just to enormous catastrophes.

“The reason the New York Zoological Society is a natural place for this type of work to start is because it has such an unusual background. At current count we have 158 programs overseas in 41 countries, so we have a constant flow of information coming in that is unique. No one else has field scientists on the ground to the extent that we do. And consequently, if you see what’s going on, this program is the logical next step.

“In conservation biology there is a technique called ‘gap analysis’, in which you evaluate, for instance, the wildlife protection reserves that you’ve set up. And as you analyze those reserves you try to determine if there are any gaps in your protective network. Well, what we did was a kind of ‘gap analysis’ of our protective methodology, and here was a glaring gap that hit us right in the face: the need for a field veterinary unit. And that is what Dr’s Karesh and Cook and their colleagues at the Animal Health Center are pioneering.”

About the Author

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