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A SPECIAL REPORT ON A HOT TOPIC

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Panther Diary

When the patient is a wild, endangered animal, no medical procedure is routine

by Steven A. Osofsky

The call came at 7:30 a.m. on June 17, 1987. A radio-collared Florida panther had been hit by a truck on a state road north of Big Cypress National Preserve. I was about one hundred miles to the south, in Everglades National Park, where I was working as veterinary assistant to Melody Roelke, wildlife veterinarian for the Florida Panther Project, an effort initiated in 1976 by the Florida Game and Fresh Water Fish Commission to save this native cat from extinction. The accident brought something unexpected: a seven-week-long association with a single animal—Florida panther male No. 20.

The Florida panther is one of twenty-seven subspecies of cougar, also known as the puma, or mountain lion. Subspecific populations of cougar are thought to exist in pockets from western Canada to southern South America, although reliable information on current distribution is lacking. Hunted intensively for skins, for sport, and as a perceived threat to livestock, North American cougar populations were greatly reduced by the early twentieth century. In the United States, native populations of the cat are now confined to the mountainous west, parts of Texas, and southern Florida, where the numbers are down to thirty to fifty animals.

Since 1972, fourteen Florida panthers are known to have been hit by motor vehicles and eleven of these animals died. The majority of all known panther mortalities is due to motor vehicles, while the second leading cause of death is shooting, even though hunting of this cat has been outlawed since 1958 and it is now listed as endangered by both the federal and state governments. In addition, the cat’s habitat is under siege, threatened by land development and by a citrus industry that creeps farther south each year. The Florida panther is a signal animal, an indicator, and saving it means saving entire wilderness areas.

When the news came through that Florida panther No. 20 had been hit, Dr. Roelke, tracker Roy McBride, one of Roy’s tracking dogs, two wildlife biologists, and several hundred pounds of capture and rescue equipment were dispatched in two helicopters to the site of
Veterinary students and zookeepers carry Florida panther male No. 20 out of the operating room after a bandage change and a root canal procedure. The author is at right.

C.W. Griffin; Miami Herald

the accident. Meanwhile, I drove ahead to the Miami Metrozoo, its hospital being the best place to bring the cat for treatment. Within two hours, a helicopter carrying the injured panther landed in an unused parking lot at the zoo. Several of us carried him into the back of a pickup truck, draping him on our laps to keep him off the hot metal truck bed. Dr. Roelke had gotten an intravenous line into one of the animal’s hind legs soon after the team had captured him. She could see that he had several large road burns on his back and left forelimb.

Apparently No. 20 had kept running after being hit; the capture team caught him when the tracker’s dog chased him up a tree. They immobilized him by dart with the anesthetic ketamine hydrochloride—using just enough to get him safely down to the ground.

On arrival at the hospital, the animal weighed in at 134 pounds. Radio collared only three months earlier, he was estimated to be three to four years old. Then he weighed 148 pounds and was the largest cat the team had ever radio collared.

The cat seemed to be breathing without difficulty and his heart rate was normal. At first he was overheated, so we cooled him down with ice. After we put him on gas anesthesia (halothane) to keep him anesthetized while we evaluated his wounds, his temperature dropped to below normal, so we took him back to the warm pavement. Eventually we stabilized his temperature at a normal 102.4°F.

To handle this cat, we always had to anesthetize him. Procedures that could be done on a typical house cat without anesthesia—a bandage change, for instance—could only be done on Florida panther No. 20 if he was unconscious. Large wild animals (and most large zoo animals) are simply too dangerous to themselves and to others to be medically evaluated without chemical restraint.

The main concern was a deep abrasion with punctures over the left carpus (wrist), exposing some extensor tendon. Scott Citino, the zoo veterinarian, also suspected possible involvement of metacarpal bones, but when the limb was radiographed from several angles, no fractures
were revealed. The cat's right front leg, sides, and back also had many areas of badly abraded skin. We later found out that the truck had dragged the cat fifty feet before it could stop. Florida panther male No. 20 would need to be anesthetized nine more times during his stay at the Metrozoo as the carpal wound required a lot of work as it healed.

We continued to administer intravenous fluids, as well as a corticosteroid to reduce trauma-induced swelling and to deal with the potential onset of shock. We also gave antibiotics: 1400 mg of oxytetracycline intramuscularly and 1920 mg of a trimethoprim/sulfadiazine combination subcutaneously, as some of the animal's wounds were badly contaminated. Dr. Citino thoroughly flushed the wound over the left carpus with a povidone-iodine solution, dressed the area with a protective silver sulfadiazine cream, and bandaged the leg.

The cat's lungs did not sound normal: with my stethoscope, I could hear hoarse crackles as he breathed. Thoracic radiographs revealed several areas of increased density within the lungs, most likely signifying that the impact of the truck had caused pulmonary contusions. At one point the cat's respiration seemed seriously compromised, and the doctors decided to place a tube in his trachea to aid his breathing and to facilitate removal of fluid from his airways with a suction device; a bloody mucus was withdrawn. Fortunately, by irritating his larynx with the tube, we elicited a coughing reflex, which brought up a fair bit of clotted blood and mucus. His breathing sounded much better after that.

At that point we decided to let the cat rest under observation. We drove him to a concrete enclosure normally used as a bear-cubbing den and put him down on the hay-covered floor. This enclosure was all that was available and not ideal for a wild panther. Number 20 did a lot of damage to his teeth, mostly by chewing on the concrete walls, during his stay. Eventually we put a heavy rubber covering on the main areas he was chewing.

Although contrary to official Panther Project protocol, No. 20 acquired a nickname, "Animal." Upon spotting tracks, Mexican trackers out west reportedly refer to a big cougar as animal and the concept was simply translocated to Florida. Animal had been given this name by the people who first tracked him because he was so big.

Animal did not eat in captivity for more than a week. According to tracker McBride, this is not unusual. Even healthy cougars may not eat for two weeks after they've been brought into captivity. For the first few days, Animal looked as though he was indeed in pain. He was depressed and breathing heavily. He'd gotten his bandage off by himself the first day. By the third day, the skin around his carpal injury looked yellow, necrotic. We gave him some more time. His breathing and attitude slowly improved. We had to keep in mind that this was a wild animal. To do anything with him would involve general anesthesia and its inherent risks. Oftentimes doing very little except observing is the best medical option when handling is so stressful for an animal.

On Animal's fifth day in captivity, he was darted with 1400 mg of a long-acting form of the antibiotic oxytetracycline. We began giving him Valium (diazepam) because he started trying to escape and abraded his face. The Valium, initially 3 mg once or twice a day as needed, was intended to keep him calm so he wouldn't hurt himself and to stimulate his appetite. When Animal started to eat and to get progressively stronger, he needed larger doses of Valium. We soon had him on it every twelve hours—by mouth if he was eating, blow darted in if he wasn't. He was most active early in the morning before sunrise. His drive to free himself was amazing: he seemed to sense no pain when he repeatedly hammered his head into a corner. This was a wild animal that had never been confined before. What could have been going through his mind? I thought about that quite a lot. When it was light out, he'd instinctively jump toward the tiny windows. An intrinsic desire to be free, a will so strong, so driving. I wished I could explain to him that he'd be free again, but of course, I couldn't. Valium was the best thing we could offer. The week before we released him, his seventh week in captivity, he was on 15 mg of Valium twice a day.

Six days after his accident, Animal was anesthetized via dart with 350 mg of ketamine for reevaluation. That works out to only about 3 mg per pound, a low dose, but enough, given Animal's debilitated state. He'd lost seventeen pounds in one week—he was down to 117 pounds. Dr. Citino cleaned out the wound over the carpus and removed the contaminated tissue at the perimeter of the injury. The defect left was three inches long and two inches wide. A drain was put in place, silver sulfadiazine cream was applied, and the leg was rebandaged. At one point the cat's body temperature had fallen to 96°F, so we warmed the intravenous fluids to above 100°F before administering them. We also used heating pads and bags of hot water to bring his temperature back up to normal. Before we brought Animal back to his enclosure, we took the opportunity to administer B-vitamins, a vitamin amino acid supplement, and iron dextran. We brought his hydration status back up to normal with subcutaneous fluids, as he was still not drinking on his own.

We took a swab from within the wound for culture and sensitivity to tell us what bacteria were within the tissues and which antibiotics might be effective against them. A B-hemolytic Streptococcus, Proteus mirabilis, Klebsiella pneumoniae, and Aeromonas hydrophila were all isolated. These bacterial organisms were all only sensitive to chloramphenicol and a trimethoprim/sulfadiazine combination. We decided to put No. 20 on trimethoprim sulfadiazine (960 mg intramuscularly, twice a day by blow dart). Another culture and sensitivity two weeks later showed that we needed to modify our antibiotic regime.
When first seen and photographed on March 10, 1987—three months before the accident—male No. 20 was the largest Florida panther to have been radio collared by the panther project capture team.

David Mann Jr

as some resistant bacteria were isolated.

Ten days after being in captivity, Animal ate. This was my journal entry:

"Learned some important stuff today. Not medicine, but something a wildlife veterinarian should know how to do. Dr. Roelke got male No. 20 to eat about five pounds of venison. Previously he had only partially chewed on rabbits provided for him. She was very patient. She used a long stick with a hook made from coat-hanger wire. Cubes of meat, two to three inches square, were placed on the end of the hook one at a time.

"The cat knocked the stick away with its paw the first five or six times. Very frustrating. It didn’t look to me as though he was going to eat. But she was persistent. I watched the cat as he grabbed at the stick with his mouth. He tasted the meat, chewed it, and swallowed it. His dealings with the stick underwent a transition. The mouthing he did changed from a hostile character to a hungry one. During this time Melody made her ‘cat noises.’ Purr and peeps, purrs and peeps (i.e., ‘cheetah peeps’). Sounded funny, but it really seemed to work. She got almost five pounds into the cat. Toward the end he was getting pretty full. To get him to open his mouth, she changed her approach. She hissed at him. When he opened his mouth to hiss back, she put the meat in. He then held it as she withdrew the stick. Patience, communication, and persistence all worked together. It quickly became obvious that the cat knew the stick meant food. He lay down with his head on the ground and waited for the morsels, as would Caesar awaiting grapes from a servant."

That was a turning point. After this we were able to get the cat to eat more and more using the same technique. Animal rarely showed much interest in meat simply put in his enclosure: he got used to eating it off the stick.

A reevaluation of his leg eleven days post injury revealed a clean wound on its way toward healing. By this time the cat had badly damaged his canine teeth on the concrete enclosure and on the bars in the chute where we shifted him for meals. And his claws were completely worn down.

Why were we keeping him in captivity? That’s a valid question, one we constantly asked ourselves. Could he survive if we let him go right now? What if we had never brought him into captivity? His leg wound, which was very deep and very prone to infection, had been caused by humans, not by another cat or prey animal. If he had not been taken in, his leg could easily have become gangrenous. A wild panther with three legs isn’t going to last too long. We couldn’t take that chance, and we did have excellent facilities available to treat him. Still, he did seriously damage his teeth in the enclosure. By the end of his stay in captivity, he needed endodontic (root canal) procedures to prevent infection in all four canine teeth. We believe he will still be able to use these teeth effectively to kill prey. His tremendous jaw strength is unimpaired. Every decision we made with this animal involved a cost/benefit analysis. Now that he is back on his own in the wild, only time will tell how well we did. We’ll know more when the cat is anesthetized in the field again for a complete biomedical evaluation. Radiotelemetry data indicate no problem thus far.

On July 2, sixteen days after the accident, we found that No. 20’s wound was granulating in, filling with connective tissue as the healing process progressed. He had gotten his bandage off several days earlier. We cleaned and rebandaged the wound. This time the bandage was anchored to the leg by sutures that went through pieces of rubber tubing stitched to the leg, which served to minimize tension directly on the animal’s skin. If the wound could have been kept clean, we might have left it open. Not being able to handle this animal without anesthetizing him made bandaging the best option.

During No. 20’s stay at the zoo, we evaluated his heart. Initial chest X-rays had hinted at some enlargement of the right heart. Two-dimensional ultrasound, as interpreted by a University of Florida veterinary cardiologist, showed an enlargement of the right atrium, and bubble contrast studies pointed to regurgitation from the right ventricle into the right atrium. An electrocardiogram was consistent with the possibility of right heart enlargement. I did find microfilaria of an innocuous nematode in the panther’s blood, but we never found any evidence of adult heartworm. Putting all this together, and given that No. 20 is a relatively young animal, the cardiologist suspects a congenital right atrioventricular valve defect. We can’t prove the problem was congenital. Nor can we prove that it is genetically based. Roelke strongly suspects, however, that there may be an inbreeding problem, given the other characteristics of this subpopulation of cats—kinked tails (found in No. 20 to be due to a deformed coccygeal vertebra), cowlicks on their backs, palpable umbilical hernias, and cryptorchidism (only one descended testicle). Roelke, with Drs. D. E. Wildt and J. G. Howard of the National Zoo, has demonstrated a high percentage of abnormal spermatozoa in the semen of male Florida panthers. She hopes to clarify the genetic situation of this subpopulation and, in collaboration with Dr. S. J. O’Brien of the National Cancer Institute, compare it with that of other subspecies of cougars in the United States as part of her ongoing isozyme and DNA analyses.

Three weeks after Animal had been injured, Dr. Roelke was able to bring the edges of the wound a bit closer together using horizontal mattress sutures anchored on rubber tubing. Endodontic work on the upper canine teeth was also done at this time. In addition, radiographs confirmed what we thought was a fracture of a midtial vertebra—related to the accident—in the process of healing. Animal was starting to feel better:

"This is not a zoo animal. This is a wild animal, and his constant attempts at escape remind us daily of that. We have to
cover up the windows when he gets in one of his 'escape moods'. He'll jump, claw, and bite anywhere he sees light breaking through. I can't blame him. I hope we can soon have him back where he belongs. His Valium dose is being increased. It's a relatively safe drug, and it may be the only thing that keeps him from doing too much damage to the tools of his trade—his teeth and his claws."

One month post injury, Dr. Citino was finally able to close the wound over the carpus using three tension-relieving incisions that allowed the wound edges to be brought together. Overall, the leg looked very clean. Citino thoroughly debrided and flushed the area and freshened the wound edges. Excessive granulation tissue had to be trimmed down. He then pulled the edges of the skin on both sides of the wound together with large mattress sutures oversewn with a simple interrupted pattern. At this point, the bandage mainly served to keep the cat from pulling out the sutures. Of course, Animal got the bandage off in two days anyway.

On July 20, thirty-four days post injury, Animal was anesthetized again to have more work done on his leg and teeth. The ends of the suture line had come undone. Citino freshened these exposed wound edges and put in some more sutures. The leg was put in a fiberglass cast—a bandage that the cat did not remove.

By July 27, forty-one days post injury, Animal weighed 137.5 pounds, several pounds more than his weight at admission. We were able to remove the remaining sutures. The carpal defect was completely closed. A final cast was applied to keep the cat from constantly licking the area, although he soon got this bandage off.

It was the management of this animal even more than the actual medicine that made this case such a valuable learning experience for me. If a domestic cat had been injured like this, we could have handled it every day, and it would most likely have healed without so many confinement-related complications. Close attention to doses of the sedative and to the animal's responses were needed to keep him at just the right level.

The end product of all this, the goal of all our work, was a successful release back into the wild. The day before the release, Animal was obviously ready to go:

"This weekend Scott had to up No. 20's day dose of Valium to 15 mg. So, now he's on 15 mg bid [twice a day]. Scott thinks he may need to go up to 20 mg tonight. We noticed a sudden increase in the cat's activity after he was taken off of cefadroxil. Citino thinks that perhaps the antibiotic has been interfering with the Valium at some level. Perhaps now the Valium is being metabolized/excreted more rapidly and hence the cat is more alert. Makes sense. He's been pulling the rubber off the walls. He looks great."

On Tuesday, August 4, 1987, Animal was released:

"Animal is gone. The release was everything I'd thought it would be.

"We loaded him into the crate at 3:00 A.M. At first he was a bit hesitant, but he eventually walked from the chute into the crate. We had to tilt the crate on its side to get it into Melody's truck. It was a three-hour trip to an area about twenty miles north of Big Cypress. The actual release took place on private property. The landowner raises cattle and grows citrus in this area

big guy, a Florida panther injured in a road accident in 1984, now lives on White Oak Plantation, in Yulee, Florida, a captive breeding facility for endangered animals.


The drive through the undeveloped part of the ranch to the release site was quite scenic. Palms, swamp, hardwood hammocks, open fields, cattle—even a wild hog and a deer.

The chosen release site was a wet, open area surrounded by forest. We unloaded the crate and the press proceeded to get organized. They were directed to line up in a row about forty feet in front of the crate. I was surprised. I thought we'd have to stay in vehicles or behind trees. To the left of the crate was a tree line several hundred yards away. Directly in front of the crate, and behind the reporters and cameramen, was a closer tree line, about fifty yards away. The thought was that he'd come out, see all the people, and run the other way. Nice theory. That's not what happened.

The cat was lying down in the crate when Melody opened it. He immediately leaped up and darted out. He was understanably disoriented and headed . . . right toward where I was standing. I had been looking through my camera when I saw the panther was going in the 'wrong direction.' I temporarily dropped the camera away from my eye and looked at Animal head-on. I backed off a bit and he veered to the left. He then ran straight toward the line of reporters, who quickly became disoriented themselves. The cat darted right between two of them. He ran into the woods behind us and, surprisingly, stopped and turned around. He looked at us, and all I could think of was how confusing these past weeks must have been for him.

After glancing back at the assembled crowd, he trotted off into the woods at a less hurried pace. Perhaps he felt safer in the woods. Perhaps he already knew where he was. The release site is within his known home range area. Radiotelemetry revealed that he didn't wander off too far while we were there—perhaps a few hundred yards into the woods. A game commission plane later circled overhead to determine his precise location.

"I kept looking at where he had run into the woods, but of course I didn't see him again. I'll never forget his run back into the wild. Never."