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Abstract: If Laurie Marker-Kraus was not the only viticulturist in Oregon with her own cheetah, she certainly remains the only one who ever took a cheetah to Africa and taught it to hunt.

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The Cheetah's Race to Survive

Laurie Marker-Kraus, Helping the Big Cat Cheat Extinction

By Ken Ringle
Washington Post Staff Writer

If Laurie Marker-Kraus was not the only viticulturist in Oregon with her own cheetah (a doubtful proposition), she certainly remains the only one who ever took a cheetah to Africa and taught it to hunt.

The cheetah's name was Khayam (as in Omar), a year-old female that Marker-Kraus had raised from a month-old kitten after throwing over the wire-gloving business to get back into animals. Khayam slept by her bed at home and roled with her to work at Wildlife Safari, a drive-through game park in Oregon's Umpqua Valley. It was there Marker-Kraus had learned just how rapidly the world's fastest land animal was vanishing in

the wild and began studying the difficult task of breeding the aristocratic cats in captivity.

But then she started wondering: Suppose the day comes when we have enough cheetahs to reintroduce to the wild. Will they feed themselves by instinct or need directions?

"We didn't know," says Marker-Kraus, her cheetahlike cheekbones flexing beneath a jungle of dark hair. "So I took Khayam to Namibia and showed her some antelope. She just sat there on the grass with me, watching them go by. I tried sunning after them. She ran after me thinking it was play time. ABC Television was there to film the thing. After a day or so they packed up and said 'Right. Call us when you have something,'" and

See CHEETAHS, C6, Col. 1



Cheetah expert Laurie Marker-Kraus in front of a picture at the National Zoo.

Laurie Marker-Kraus

CHEETAHS, From C1

few off. I began thinking 'If she doesn't learn to hunt I'll never get home.'

Khayam did learn—you can catch her action in the opening sequence of "American Sportsman"—but it took 2½ months.

"I kept running after them and eventually she figured, 'This must be something Mom wants. Maybe I can help,' and began trying to head a ew back to me. Finally, by instinct as a sense of play, she tripped up one little steinok. I fell on it, she jumped on me and I forced her jaws around the windpipe and squeezed them shut. After that she got the idea."

These days Marker-Kraus, 38, is talking cheetahs at the National Zoo, which hasn't had any since 1980. If that seems strange it also says something about cheetahs, whose problems surviving both in and out of captivity are every bit as exotic as the spotted cats themselves.

Marker-Kraus, who grew up surrounded by animals in rural California, now spends her days on the phone coordinating cheetah data, seeking research funds and devising a "species survival program" for cheetahs to help institutions and govern-

ments better protect and propagate them.

The Walt Disney people called her, hoping to cast Khayam in the title role of the current film "Cheetah," which she hopes will help focus attention on the big cats. "But I had to refer them to some other cheetah owners. Khayam died a few years ago at the age of 10. It was like losing my best friend."

Treasured for their speed and elegance by everyone from Pharaohs to film stars, cheetahs have been kept by humans for more than 4,000 years. Genghis Khan had 1,000 in his hunting stable; Josephine Baker paraded one on the streets of Paris. But until 1956, the only recorded cheetah birth in captivity was documented by Akbar the Great, one of the Mogul rulers of India, in the 15th century. Today, about half the 650 zoo-held cheetahs (out of an estimated world population of 15,000) have been bred in captivity, but it's still an enigmatic process scientists are racing against time to unlock.

Cheetahs would seem to have evolved, through selective breeding, as a subset of Lamborghini-style spotting specialties of the leopards they so resemble. In truth, however, they greatly predate the lion and the leopard in prehistory and form a distinct



A cheetah and her cub.

genus that ranks as the most specialized in the feline family.

Their 20-foot strides and 70 mph speed have been purchased at the price of power and endurance, which has left them vulnerable to other predators. Cheetahs are rarely aggressive and not infrequently surrender their kills to lions, hyenas or vultures who show up while the fleet cats are catching their breath.

Their biggest handicap, however, and the apparent clue to their long refusal to breed in captivity, is an apparent accident of genetics. Some 10,000 years ago, near the end of

the Ice age, cheetahs apparently were nearly wiped out along with animals such as the saber-toothed tiger. They survived, but in such few numbers at the time that the species experienced a "genetic bottleneck" of inbreeding in subsequent generations.

The result, Marker-Kraus and other cheetah researchers discovered to their astonishment only recently, is that the entire species today shares a virtually identical genetic fingerprint. Cheetahs from parts of Africa thousands of miles apart are as alike in their cell structure as laboratory mice descended from 20 generations of brother-sister breeding.

Such a lack of intra-species diversity has produced animals that breed less frequently and less successfully, produce fewer and less healthy offspring, and are more vulnerable to disease. It also has left scientists few places to turn in their search for ways to increase the stock of cheetahs worldwide and safeguard them against extinction.

While a few zoos and game parks around the world have recently bred cheetahs with sporadic success, it still isn't known just why some couplings work and some don't. In an effort to find out, Marker-Kraus has been designated keeper of the International Cheetah Stud Book, which records the names of the 650-odd cheetahs held in 140 zoos around the world and charts their breeding attempts and partners.

"It appears we may have to do actual physicals on all these cats," she says, "in order to identify sterile individuals and remove them from the breeding program and identify those with the greatest chance for breeding success."

Meanwhile, at the National Zoo, reproductive physiologist David Wild and veterinarian Mitchell Dush are looking hard for answers at artificial breeding, where little had been done with feline species. As any cat owner knows, cats as a group tend to be readily reproductive on their own. Lions, for example, have been documented mating 157 times in 85 hours (a not unusual pace for them) and produce offspring so casually and so often that zoo pat them on birth control.

"Because of that, there was no impetus for artificial breeding in cats, even domestic cats," Marker-Kraus says. "The zoo produced the first litter of 'telescopic' kittens just three weeks ago," marking another step toward test-tube cheetah reproduction. Even that, she says, was far more complicated than it might seem: Unlike lions or cattle or horses or other species where artificial breeding has been long and tried, feline eggs were not readily obtainable. "With cats, including cheetahs, it's the breeding itself that makes the female ovulate," she says. Wild and Dush had to find out how that worked."

Marker-Kraus hopes the laboratory breeding breakthrough with domestic cats will prove transferable to cheetahs, thus helping compensate for the low fertility of most

cheetah males, and permitting scientists to maximize what little genetic variation there is within the species to produce more and healthier cheetah cubs.

"It's all part of a worldwide survival strategy we're trying to devise," she says.

Other parts of the strategy are no less complex. While habitat destruction and other human population pressures push cheetahs out of some areas of Africa, game preserves have proven dangerous for them in another way. "Ironically," Marker-Kraus says, "game preserves produce an expansion in the population of lions and hyenas and other animals competitive with the cheetah, so they tend to be crowded out there, too."

If all that makes things sound hopeless, Marker-Kraus believes the cheetah can survive. In October she'll return to Namibia, home of the world's largest concentration of cheetahs, to help by the ground-work for conservation programs that will go in place when that country wins its coming independence from South Africa.

"People don't realize how much there is to be done to save animals

like the cheetah and how little time we have," she says. Even in an era of increasing environmental awareness, there is "great ignorance" even among sympathetic people. Animal rights activists are particularly frustrating because "they don't seem to understand the inevitable trade-offs of science. Obviously no one wants to mistreat animals in the laboratory, but if we had to sacrifice one domestic cat to save the entire species of cheetahs, wouldn't that be worth it? The money from just one of their [animal rights groups] mass mailings could help save a whole species."

Marker-Kraus and cheetahs are only a small part of the National Zoo's program of research into captive breeding designed to make it a kind of Noah's ark for endangered species in the worldwide flood of environmental change. But there's something especially compelling about the beautiful spotted cats with the designer eye makeup and a body nature-scripted for speed.

Call it cheetahs.
When Khayam died, all of Oregon mourned," Marker-Kraus sighs. "One town contributed a bronze statue of her for its main street."

Around the Mall and beyond

Everyone knows that a cheetah can run faster than the speed limit on the Interstate. Not so many people know that this leopardlike animal is really a different breed of cat, with a genus all to itself: *Acinonyx*; or that there's only one species, *jubatus*; or that the various subspecies, based on the regions of occurrence, are so much alike that you might as well forget them. Whether it hails from the blistering hot Atlantic shore of Senegal or from Kruger National Park, 4,250 air-miles away, a cheetah is simply a cheetah.

That genetic homogeneity is a big reason why this, the world's most fleet-footed land mammal, is also one of its most endangered creatures. It was to learn more about cheetahs that I dropped in at the Smithsonian's National Zoo recently.

One thing that's kept the number of births down is genetic health. When there's little difference between the genetic makeup of animals, they become inbred. Their young don't live very long—often don't even make it to birth. Those highly homogeneous cheetahs are a perfect example. Laurie Marker-Kraus, a tallish, friendly, thirtysomething woman from Oregon, directs a National Zoo program called New Opportunities in Animal Health Sciences (NOAHS).

Marker-Kraus is generally recognized as the world's walking encyclopedia of cheetahs. Mention the word to her and she lights up with a jolt of inner voltage. This makes her a gratifying expert for a journalist to interview. By the time I screwed up enough courage to call her by her first name, she was telling me that cheetahs (at about three times their present 100-pound bulk) may have originated in what is now North America; that they once roamed the Earth; that some 10,000 years ago their population crashed; that today's cheetahs descend from the survivors of that population bottleneck.



Mary Alice whispers sweet nothings to National Zoo director Michael Robinson.

Wild cheetahs now number maybe 15,000, but they're split into small geographic cells, 100 here, 400 there. That's why they lack genetic variety.

"Blame people like Akbar the Great for a lot of the problem," Laurie told me. I was quite willing to, if only I knew who he was. She enlightened me.

"Between the 14th and 16th centuries, cheetahs were used for hunting in Central Asia and India—the way some people still do with falcons. Cheetahs are easy to tame and get along well with humans. Akbar the Great, a Mogul emperor, had 9,000 of them during his reign. But the trouble is, they rarely breed in captivity." So the Asian cheetah is practically gone, and the African is inbreeding. Seemingly this is the perfect opportunity for zoo animals to step into the breach and keep the species alive. But it takes a lot of lab work to find cheetahs that are genetically diverse enough for breeding.

Laurie's giant first step has been to compile the "International Studbook" of *Acinonyx jubatus* and keep it updated. This lists about 800 cheetahs in zoos and captive wildlife parks (I counted 138 such places in my copy) throughout the world. By referring to it, zoo curators and the NOAHS people can identify animals of the right age, health and genetic background to breed. If this program and the new techniques of artificial insemination and IVF can work with cheetahs, other endangered cats will also benefit. The zoo team, collaborating with Florida officials, is already trying to save the Florida panther.

got her when she was just a hafluff, born at Wildlife Safari in Oregon, where I ran the cheetah program. We had plenty of room to staff enough to work with in animals, and the result was a successful breeding record in America."

Laurie managed to fit the lit-tle Khayam, into a country home already bulging with dogs, a gilbey, and French Alpine goats. (She helped develop the National Goat Association.) Khayam was timorous and dependent. She'd sit beside Laurie around the property the village. She'd come when I rang a bell. She was easily shooed out of the way at mealtimes. The *American Sportsman* series spent a visit to Africa. Laurie took almost full-grown at just over to see if zoo-raised cheetahs someday be introduced into t. Did they hunt instinctively or learn from their mothers? "It wasn't at all like Oregon," says Laurie. "Khayam was scared at first a very close to me."

It became clear that hunting was behavior. Laurie had taught the to run after a mechanical lure in Oregon, and in Africa she went to watering holes where hun- various antelope came to drink in the grass with Khayam u- came close. Then I'd spring dash after it. Khayam would with modest interest, then roll go to sleep."

But after a couple of mo- cheetah would lope along af- "She seemed to be thinking," C must want one of those thi- she'd course it back toward r- she started tripping them, an- she spilled one near enough s- jump on top of it. She just loo- that first time, but soon she go- She made a few kills and bro- back to me, and when she star- I'd pretend to take them away- would get aggressive toward n- what I wanted."

The "new" Khayam who c- to Winston was like a shrink- returning from a hitch in the- "She was very sure of hersel- still wonderful with people, bu- her looking at the goats differ-

Laurie used to take Khay- when she lectured about th- problem—they once came t- tional Museum of Natural- "When the animal died at a- for a cheetah—the town of W- up a bronze statue of her.

But the best memorial- Marker-Kraus' work at the- Zoo.

Edwards Pan-