

FEATURE

WHERE THE WILD THINGS WERE

The recent *Nature* paper proposing to bring cheetahs, lions, and elephants to North America raised a wild rumpus. But are the critics missing the point?

by William Stolzenburg



Illustration by Carl Buell

THE CONJURED IMAGES were surreal, lions prowling Nebraska corn fields, elephants stomping across North Dakota. From there the visions grew frightful, exotic and dangerous beasts swarming the Great Plains, slaughtering livestock, spreading disease, ruining rural livelihoods as far abroad as Africa. When, last August, a group of 12 conservation-minded scientists and scholars aired a provocative proposal in the prestigious journal *Nature* (1), the journalists who reported it and the colleagues who publicly pummeled it couldn't help letting their imaginations run wild. Which was at least part of the idea.

Under the audacious heading "Re-wilding North America," the paper's authors—among them some heavyweights in the field of conservation biology—called for restoring "large wild vertebrates into North America," meaning those that disappeared at the end of the last ice age. In the two pithy pages that followed, those large wild vertebrates were spelled out in the more-familiar terms of camels, horses, tortoises, and—as if to make sure no one was nodding off in an armchair—cheetahs, lions, and elephants. Yes, in the United States. For real.

The paper was partly meant to jostle a conservation community suspected of falling asleep at the wheel. At that it succeeded. In the first week following publication, the two lead authors received more than 1,000 letters and phone calls from three continents. They saw their proposal aired on network TV and discussed in national newspapers and magazines. Some of the comments were congratulatory, a good many of them were disparaging, a handful of them were downright hateful.

But too few of the naysayers, to the authors' disappointment, offered much beyond wet-blanket dismissals. None seemed willing to venture near the soul of their proposal. In their paper they had politely pointed out that the 1492 arrival of Columbus—long considered North America's standard of ecological excellence—was in fact the "discovery" of a conti-

nent already plundered of its greatest beasts. Why not raise the standard, to that more glorious and decisive moment some 13,000 years ago, when people first set foot in North America? It was a profoundly optimistic invitation—to elevate the very goal of conservation—that somehow got muffled amid a chorus of scorn. Maybe it was all just a misunderstanding arising from the little paper's herculean task of explaining such a giant vision in so few words.

Maybe the authors—who do indeed see a need for elephants and lions one day to wander the plains of North America—had simply lost their marbles. Or could it be that the would-be rewilders—in so nakedly challenging the status quo of conservation—had unveiled a flaw too fearsome to face?

WHATEVER THE REASON, no one could say the rewilders hadn't offered fair warning. The idea of restoring America's fauna to something more closely resembling prehuman times—when sabertooths prowled and mammoths thundered through places that would later be called Los Angeles and Newark—has a far deeper history than its latest splash in *Nature*. Paul S. Martin, a coauthor of the rewilding paper and an outspoken paleoecologist from the University of Arizona, has been unabashedly promoting such Pleistocene visions in print and in public lectures for 40 years. Even as the *Nature* bombshell was hitting the streets, a book-length version of the rewilding proposal was quietly headed to press in Martin's magnum opus, *Twilight of the Mammoths* (2).

Twilight is the autobiographical odyssey of Martin's renowned "overkill" hypothesis, which lays the brunt of the blame for the late Pleistocene extinction—the abrupt disappearance of some 40 species of horses and camels, glyptodons and ground sloths, lions and bears, mammoths and mastodons—in the spear-wielding hands of North America's first big-game hunters, the Clovis culture. Infused throughout with Martin's admiration for

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America's missing megafauna, *Twilight's* concluding chapters are dedicated to their return. "I believe it is time to take an approach that includes not only creatures traditionally considered 'at home on the range' but also some of those not seen roaming the Americas by any humans since the Clovis people," writes Martin. "The Bering Land Bridge should not be shut down forever in the interest of imagined faunal purity."

NOT EVERYONE HEARD heresy in Martin's Pleistocene preachings. In a 2004 issue of *Conservation Biology*, Martin and Cornell doctoral candidate Josh Donlan published a paper called "Role of ecological history in invasive species management and conservation" (3). In it they prodded their colleagues to rethink more seriously the pristine myth of 1492. Their paper was peppered with Pleistocene ambitions: "In the process of returning the California condor . . . to the Grand Canyon, should we also return the kinds of animals the bird once fed on: equids, camelids, mountain goats, and proboscideans?"

Donlan's advisor at Cornell was the evolutionary biologist Harry Greene, by coincidence a friend and kindred spirit of Martin. Greene and Donlan often found themselves wondering about rewilding and how such a seemingly legitimate goal for conservation had apparently gone nowhere. "Most people dismissed it as silliness," says Greene. "The more we talked about it, Josh and I decided it's not silly. Let's put together a working group. Let's thrash it out."

The two assembled an eclectic team of twelve—experts in paleoecology, large mammals, community ecology, predator-prey dy-

namics, invasive species, grassland ecology, the politics of conservation. Among them, of course, was the chief messenger of overkill, Paul Martin. There, too, was Michael Soulé, one of the spearheads of the modern discipline of conservation biology; marine ecologist James Estes, whose unveiling of the sea otter as a key architect of Pacific kelp forests had become one of the classic studies in ecology; and Dave Foreman, former congressional lobbyist and founder of the Rewilding Institute, a think tank for restoring large carnivores to vacant niches of North America.

In September 2004, they gathered for a long weekend at Ted Turner's Ladder Ranch in the Chihuahuan Desert of New Mexico. Over easels and PowerPoint and after-hours beers, they dissected the rewilding idea and broke it down to its factual nuts and bolts, its practical challenges and criticisms, its societal costs and benefits.

The Ladder group agreed on several sobering premises: That human influence had utterly pervaded the planet. That what qualifies for wildness today is a paltry façade of the awesome Pleistocene bestiary we stumbled upon only 13,000 years ago. That the difference between then and now is at least partly, if not principally, our own doing and therefore our duty to repair.

REGARDLESS OF WHO or what was to blame, they concluded that the large animals' absence was to be ignored at great peril. Forests, grasslands, and savannas had evolved in step with the Pleistocene megafauna. Their soils had been turned by trampling hooves, their seeds widely ferried and judiciously

fertilized in herbivore dung. All but the very biggest of those herbivores had in turn been shaped in body and habit by their large predators. Were there no repercussions for such wholesale megafaunal erasure? Reports from the field were already suggesting the feared answer.

There was northern Siberia, where about 10,000 years ago 1 million km² of vibrant grasslands had suddenly vanished. They had been replaced by infertile mossy tundra—a transfor-

meted in stepwise fashion. From there, the ecological cascade rumbled all the way to the bottom of the sea. As sea otters disappeared, their prey proliferated. Sea urchins marched *en masse*, mowing down coastal kelp forests across the Aleutians and reducing one of the Bering Sea's most productive ecosystems to barrens.

The megafauna's most shining endorsement is now on public display in the dramatic greening of Yellowstone National Park under

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mation that ecologist Sergey Zimov attributes to the disappearance of a great menagerie of Pleistocene grazers. Zimov and colleagues argue that the grassy Siberian steppe that once fed musk oxen, mammoths, and wild horses was fed in return by the megafauna. (4) Their manure fertilized the grasses, and their hooves trampled the competing mosses.

The legacy of the missing mammoths may run deeper still, to the frozen ground. There, some 500 gigatons of carbon—more than twice the tonnage stored in tropical forests—lies tenuously locked in ice. As the climate now warms at breathtaking rates, Zimov foresees the permafrost melting and those gigatons of carbon being released skyward, feeding runaway greenhouse heating. It helps explain the urgency with which Zimov has been leading a government-backed rewilding experiment in Siberia. Grasslands maintain colder soils than moss-bound tundra. By restocking the tundra with horses, musk oxen and bison, he is hoping to win back the grasslands, to buy time against Siberia's 500-gigaton time bomb of carbon.

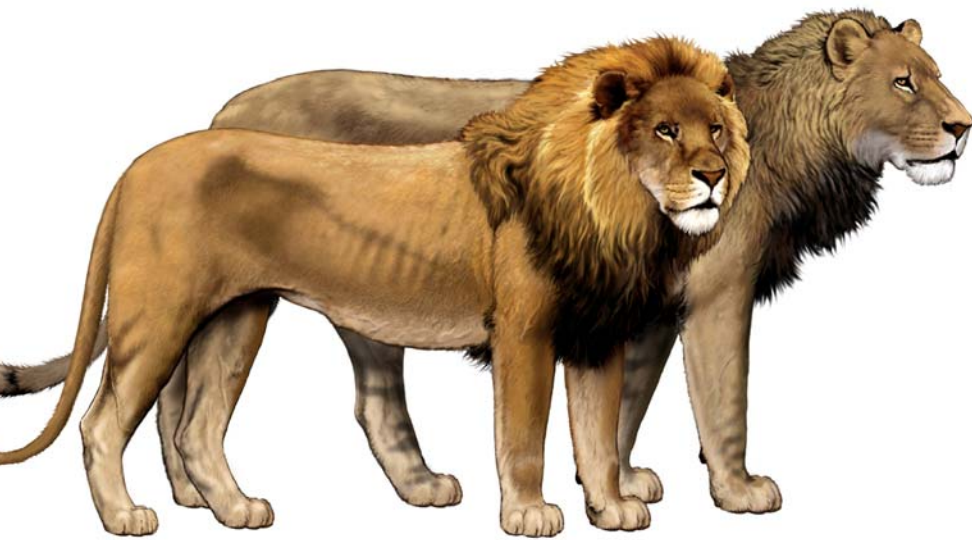
Signs of megafauna importance have also been coming from the sea. Most notoriously, there is an ongoing collapse of marine mammal populations in the North Pacific, quite possibly stemming from the decimation of great whales (the ultimate megafauna) by industrial whalers. This hypothesis, championed by Alan Springer and Jim Estes, followed from corroborating lines of evidence. (5) The great whale's disappearance forced its chief predator, the killer whale, to seek smaller game in the form of sea lions, seals, and sea otters, whose numbers plum-

the reinstated reign of the gray wolf. For 70 years following the wolf's extermination from the park, Yellowstone's oases of aspens, cottonwoods, and willows had been browsed to stubs by the world's largest herd of elk. Within five years of the wolves' return in 1995, the elk were running scared and willows were sprouting three meters high. With the willows' return, the beaver followed—from one colony before wolf reintroduction to ten colonies at last count. With the new beaver ponds have come more fish and with the streamside groves more songbirds. The list of beneficiaries goes on, from ravens and grizzlies fattening on wolf leftovers to the encouraging number of surviving pronghorn fawns now that the lurking coyotes have been scattered by territorial wolves. (6)

These are part of a growing body of portents to the ecological costs of doing nothing, not to mention the esthetic bankruptcy foreseen in a world overrun with weeds. In short, the megafauna matters. Which brought the Ladder 12 to a rather imposing quandary, that of resuscitating a graveyard of deceased species.

Their answer was, in a word, proxies—close relatives and ecological equivalents that would serve as megafaunal stand-ins, that might rekindle what the mass extinction had extinguished. The country was already well stocked with potential candidates. Not too far from where the Ladder 12 were sitting, some 77,000 large mammals were roaming the Texas hill country within the expansive confines of game ranches. Among them were camels, cheetahs, and myriad species of African antelope. Surviving cousins of mammoths and mastodons

Above: The "African" lion in the foreground is an example of the modern sub-Saharan animal. The larger beast behind, American lion (*Panthera leo atrox*), was the most widespread mammal in the late Pleistocene except for man. Its remains have been found in over 40 localities from Alaska and the Yukon to California as well as east to Florida and south to Peru. The most recent radiocarbon-dated fossil is just over 10,000 years old. (Illustration by Carl Buell)



were living in zoos across the U.S., and there were some 16,000 working elephants in Asia.

Here was a means of not only restoring North America's megafauna but also providing a fail-safe for endangered megafauna of the world. Wild Bactrian camels, on the verge of extinction in their last holdout in the Gobi desert, might find new refuge in the prickly scrublands of the Southwestern U.S.

Here, also, was a way to essentially resume evolutionary roles, wherein cage-bound cheetahs and lions might once again hone their speed and wits in open pursuit of North America's repatriated herbivores.

If all went well with the trial runs, perhaps one day the fences could be moved back to accommodate grander arenas—Pleistocene parks—in the widest unpeopled spaces of the Great Plains. Such was the essence of the rewilders' ultimate vision.

Word went out in the *Nature* paper, and word quickly came back, setting Greene and Donlan's phones ringing and email boxes ping-pong. News bureaus on both sides of the Atlantic swooped in, smelling blood. Amid the few tepid nods of approval from the professional ranks, the jeers resounded. "Pure fantasy." "A terrible and absurd idea." "Impossible."

African critics savaged the American rewilders for threatening to take away not only their animals but also their ecotourism dollars. One even suggested they were fronting for big-money sport gunners who shoot fenced animals. "It's not a stretch to say that they mostly thought we were going to come dump a bunch of elephants on the suburbs of Topeka," says Greene.

It was as though the rewilders had floated a handful of trial balloons and nobody had noted the blimp among them. There was no serious scientific challenge to the rewilders' new Pleistocene restoration benchmark.

A 12-MINUTE TALK gains us no converts, says Greene. "Sometimes people's first reaction is we must be stupid. But it turns out when we give the 50-minute talk, people realize they haven't thought about this as much as we have. They say 'Huh? I didn't know there was a holarctic lion or that cheetahs lived here 11,000 years ago. I didn't know there were five species of horses.'"

Five weeks after the 12-minute version of "Re-wilding" appeared in *Nature*, Greene was invited to give the full 50 minutes to a roomful of curious biologists and conservationists in the vertebrate zoology wing of the National Museum of Natural History in Washington, D.C.

Greene began by passing around a fibrous sphere of dried plant bits the size of a softball. "It is what it looks like," said Greene. Its original owner was a creature with the bulk of a grizzly bear, ambling about the inner gorge of the Grand Canyon 11,000 years ago. "It's a Shasta ground sloth turd and it's not a fossil."

This, explained Greene, was his favorite response to those suggesting the Pleistocene was such an irrelevantly long time ago. "Ten thousand years ago is only a hundred centuries. It's twice the lifespan of the longest-living plant on Earth today. Yes, 10,000 years ago is a lot longer than I'll live, but it may not be so long in some other contexts."

For the next 50 minutes, Greene serves up more metaphorical handfuls of sloth dung, irreverently bursting conservation's most precious myths, chiding the media's worst-informed critics, and repeating his blasphemy: Why not Pleistocene rewilding?

To the notion that wild horses are pests of the North American range, Greene offers this answer. "When I moved to Berkeley in 1978, I bought into the prevailing wisdom there, which is that [wild horses] are the scum of the earth, that they tear up wetlands, and we should all be given old-Model 94s and go out and shoot burros," says Green. "It never occurred to me to wonder why, if they're so bad now, they weren't bad 100 centuries ago?" It turns out the animal the Spaniards brought to North America in the 1500s is very closely related to the animal that once played a key role in dispersing seeds of Pleistocene savannas, says Greene, which makes today's wild horse literally the native returned.

To one of the more resounding objections, that the African lion doesn't belong here, Greene suggests that the African lion is a myth. DNA tests show that the king of beasts that so famously presides over African savannas is likely a subspecies of a more cosmopolitan cat—let's call it the holarctic lion—that once ranged across the northern hemisphere. If conservationists can restock the U.S. with seven subspecies of peregrine falcon from around the world, why can't they reinstate the holarctic lion?

"Here are some other common criticisms," Greene says, flashing a quote on the screen.

"Haven't you people heard of rabbits and cane toads?" (Referring to the textbook catastrophes that followed introduction of South American cane toads and European rabbits to Australia, both of which ended up sweeping the continent like plagues.)

Greene adopts a comically incredulous tone: "I'm *astonished* to hear biologists say this to me. I know that there were no placental mammals in Australia, let alone rabbits, until very recently. And not only were there no cane toads in Australia, there were no *bufonids*! We're not talking about something like that, we're talking

about organisms whose very close relatives or conspecifics were in this country 100 centuries ago."

Throughout his presentation, Greene conveys a bittersweet mix of vindication and disappointment with regard to the lameness of his colleagues' objections, their blindness to rewilding's inherent optimism. But even as he struggles to explain how the scientific discussion has so uncannily skirted the science, it soon becomes clear that science was never really the issue.

Greene flashes another familiar doubt on the screen: "People won't tolerate wolves and grizzlies; they surely won't tolerate elephants and lions." Here Greene has finally run out of hopeful retorts. "It might be this is an insurmountable problem."

It turns out rewilding has laid far more than science on the table. It has challenged the top-most survivor among the megafauna to consider lightening up its 13,000-year death grip on dominance. It has opened new and frightening territory.

When all is done, Greene asks for questions. Nothing but softballs are returned. The conversation is courteous, playful, apparently supportive of bringing home the Pleistocene megafauna. But then again, this is the National Museum of Natural History, where all the elephants and lions down the hall are stuffed. ♣

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