"Louv's groundbreaking book has been a catalyst for kick-starting the (back-to-nature) movement." —*USA Weekend*

the NATURE PRINCIPLE

Human Restoration and the End of Nature-Deficit Disorder

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Nature-Deficit Disorder for Adults

Listen: there's a hell of a good universe next door; let's go.
—E. E. Cummings

We traveled down a dirt road through the melting adobe village of Puerto de Luna, New Mexico, crossed a low bridge over the shallow Pecos River and entered a valley of green chili fields held by red-rimmed sandstone bluffs. Jason, our older son, then three, was asleep in the back seat.

"Is it this turn?" I asked my wife.

"The next one," Kathy said.

I got out of the rental car and unhooked the gate, and we drove onto the land owned by our friends Nick and Isabel Raven. They were away working in Santa Fe that year, and their farm and house were vacant. We had come to know them before Jason was born. Kathy and I had lived two summers in nearby Santa Rosa, where she had worked in a local hospital.

Now, after a stressful period of our lives, we were back for a couple of weeks. We needed this time for ourselves, and we needed it for Jason.

We entered the dusty adobe house. I inspected the room addition that I had helped Nick build during one of those summers. I turned on the electricity and the water (indoor plumbing had finally come to the Raven homestead), walked into the kitchen, and opened the faucet. A foot-long centipede leapt out of the drain, its tail whipping toward my

face. I don't know who was more startled, the centipede or me, but I was the one holding the steak knife.

Later, as Kathy and Jason took naps, I walked outside in the heat, found Nick's rusted folding chair, and set it in the shade of a tree next to the adobe. Nick and I had rested under the branches of this tree between bouts of mixing adobe mud in a pit filled with straw, sand, earth, and water. I thought about Nick, about our political arguments, about the green-chili stew that Isabel heated on a wood stove and served in tin bowls, even in the hottest hours.

Now I sat alone and looked out over the field toward a line of distant cottonwoods that rimmed the Pecos. I watched the afternoon thunderheads rise above the high desert to the east and the layers of sandstone across the river. The field of chili shivered in the sun. Above me, leaves rattled and tree limbs scratched. My eyes settled on a single cottonwood at the river, its branches and upper leaves waving in a slow rhythm above all the others. An hour, perhaps more, went by. Tension crawled up and out of me. It seemed to twist in the air above the green field. Then it was gone. And something better took its place.

Twenty-four years later, I often think about the cottonwood at the river's edge, and similar moments of inexplicable wonder, times when I received from nature just what I needed: an elusive *it* for which I have no name.

We have thought about moving to New Mexico ever since. Or rural Vermont. But we are reminded daily that *it* also occurs where we already live—and even within the densest cities, where the urban wild still exists in the most unexpected places. It can be restored or even created where we live, work, and play.

We're not alone in feeling this hunger.

One day in Seattle, a woman literally grabbed my lapels and said, "Listen to me, *adults* have nature-deficit disorder, too." She was right, of course.

In 2005, in *Last Child in the Woods*, I introduced the term *nature-deficit disorder*, not as a medical diagnosis, but as a way to describe the growing gap between children and nature. After the book's publication, I heard many adults speak with heartfelt emotion, even anger, about this separation, but also about their own sense of loss.

Every day, our relationship with nature, or the lack of it, influences our lives. This has always been true. But in the twenty-first century, our survival—or thrival—will require a transformative framework for that relationship, a reunion of humans with the rest of nature.

In these pages, I describe a future shaped by what I call the Nature Principle, an amalgam of converging theories and trends as well as a reconciliation with old truths. This principle holds that a reconnection to the natural world is fundamental to human health, well-being, spirit, and survival.

Primarily a statement of philosophy, the Nature Principle is supported by a growing body of theoretical, anecdotal, and empirical research that describes the restorative power of nature—its impact on our senses and intelligence; on our physical, psychological, and spiritual health; and on the bonds of family, friendship, and the multispecies community. Illuminated by ideas and stories from good people I have met, this book asks: *What would our lives be like if our days and nights were as immersed in nature as they are in electronics? How can each of us help create that life-enhancing world, not only in a hypothetical future, but right now, for our families and for ourselves?*

Our sense of urgency grows. In 2008, for the first time in history, more than half of the world's population lived in towns and cities.[1] The traditional ways that humans have experienced nature are vanishing, along with biodiversity.

At the same time, our culture's faith in technological immersion seems to have no limits, and we drift ever deeper into a sea of circuitry. We consume breathtaking media accounts of the creation of synthetic life, combining bacteria with human DNA; of microscopic machines

designed to enter our bodies to fight biological invaders or to move in deadly clouds across the battlefields of war; of computer-augmented reality; of futuristic houses in which we are surrounded by simulated reality transmitted from every wall. We even hear talk of the "transhuman" or "posthuman" era in which people are optimally enhanced by technology, or of a "postbiological universe" where, as NASA's Steven Dick puts it, "the majority of intelligent life has evolved beyond flesh and blood intelligence."[2]

This book is not an argument against these concepts or their proponents—at least not the ones who are devoted to the ethical use of technology to expand human capacities.[3] But it does make the case that we're getting ahead of ourselves. We have yet to fully realize, or even adequately study, the enhancement of human capacities through the power of nature. In a report praising higher-tech classrooms, one educator quotes Abraham Lincoln: "The dogmas of the quiet past are inadequate to the stormy present. The occasion is piled high with difficulty, and we must rise with the occasion. As our case is new, so we must think anew and act anew." That we should; but in the twenty-first century, ironically, an outsized faith in technology—a turning away from nature—may well be the outdated dogma of our time.

In contrast, the Nature Principle suggests that, in an age of rapid environmental, economic, and social transformation, the future will belong to the nature-smart—those individuals, families, businesses, and political leaders who develop a deeper understanding of nature, and who balance the virtual with the real.

In 2010, *Avatar* became the most watched film in history. The success had less to do with the movie's advanced 3-D technology than with the hunger it tapped—our instinctive knowledge that the endangered human species is paying an awful price as it loses touch with nature. Describing the core message of the movie, the film's maker, James Cameron, said: "It asks questions about our relationship with each other, from culture to culture, and our relationship with the natural world at a time of nature-deficit disorder." This collective disorder

threatens our health, our spirit, our economy, and our future stewardship of the environment. Yet, despite what seem prohibitive odds, transformative change is possible. The loss that we feel, this truth that we already know, sets the stage for a new age of nature. In fact, because of the environmental challenges we face today, we may be—we had better be—entering the most creative period in human history, a time defined by a goal that includes but goes beyond sustainability to the re-naturing of everyday life.

Seven overlapping precepts, based on the transformative powers of nature, can reshape our lives now and in the future. Together they form a singular force:

- The more high-tech our lives become, the more nature we need to achieve **natural balance.**
- The mind/body/nature connection, also called **vitamin N** (for nature), will enhance physical and mental health.
- Utilizing both technology *and* nature experience will increase our intelligence, creative thinking, and productivity, giving birth to the **hybrid mind.**
- **Human/nature social capital** will enrich and redefine community to include all living things.
- In the new **purposeful place,** natural history will be as important as human history to regional and personal identity.
- Through **biophilic design,** our homes, workplaces, neighborhoods, and towns will not only conserve watts, but also produce human energy.
- In relationship with nature, an expanded ecological consciousness in the **high-performance human** will conserve and *create* natural habitat—and new economic potential—where we live, learn, work, and play.

Young, old, or in between, we can reap extraordinary benefits by connecting—or reconnecting—to nature. For the jaded and weary among us, the outdoor world can expand our senses and reignite a sense of awe

and wonder not felt since we were children; it can support better health, enhanced creativity, new careers and business opportunities, and act as a bonding agent for families and communities. Nature can help us feel fully alive.

The skeptic will say the nature prescription is problematic, given our quickening destruction of nature, and the skeptic will be right. The natural world's benefits to our cognition and health will be irrelevant if we continue to destroy the nature around us. But that destruction is assured without a human reconnection to nature. This is why the Nature Principle is about conservation, but also about restoring nature while we restore ourselves; about creating new natural habitats where they once were or never were, in our homes, workplaces, neighborhoods, cities, suburbs, and farms. It's about the power of living in nature—not *with* it, but *in* it. The twenty-first century will be the century of human restoration in the natural world.

Martin Luther King Jr. often said that any movement—any culture—will fail if it cannot paint a picture of a world that people will want to go to. The first brushstrokes are already visible.

This book is about the people creating that world, in their daily lives and beyond, and about how you can, too.

— Richard Louv, San Diego, 2011

PART ONE

Nature Neurons

Intelligence, Creativity, and the Hybrid Mind

The lover of nature is he whose inward and outward senses
are still truly adjusted to each other.
—Ralph Waldo Emerson

The natural world is not only a set of constraints
but of contexts within which we can more fully realize our dreams.
—Paul Shepard

CHAPTER 1

Singing for Bears

Discovering the Full Use of the Senses

There's another world, and it's in this one.
—Susan Casey, "The Devil's Teeth"

As a species, we are most animated when our days and nights on Earth are touched by the natural world. We can find immeasurable joy in the birth of a child, a great work of art, or falling in love. But all of life is rooted in nature, and a separation from that wider world desensitizes and diminishes our bodies and spirits. Reconnecting to nature, nearby and far, opens new doors to health, creativity, and wonder. It is never too late.

My younger son, Matthew, then twenty, and I were hiking upstream on Alaska's Kodiak Island. Joe Solakian, our guide, was teaching us how to sense the presence of Kodiak brown bears, the largest grizzlies, the ones that can run thirty-five miles per hour.

"Never surprise them, that's the main thing," Joe said.

And, keeping in mind the fate of Timothy Treadwell, documentary filmmaker—and meal—never try to be their new best friend.

In the shallow green pools, bracketed between two walls of forest, the salmon—chum, sockeye and pink—come here to spawn and die; this is a bear kitchen. So we talked, sang and shook the bear bells on our vests, watched for tracks, and sniffed the air for the distinctive, mingled odors of musk and rotted salmon. Now and then during the week that fragrance would suddenly fill the air and the hair on the

backs of our necks would stand up. That meant a bear was watching us from the thickets, or just around the bend, or had just left.

One afternoon, we did see a bear. It was upwind from us, beyond our hearing distance. It came out of the forest and lumbered across a gravel bar, raised its muzzle, hesitated, then turned and loped across the creek and into the trees.

Singing for bears puts the risks of everyday life in perspective.

So does being on this island. In 1964, a tsunami wave thirty feet high destroyed shoreline villages. An even greater cataclysm occurred in 1912, when Mount Katmai erupted on the mainland.

"About three o'clock in the afternoon, as we emerged from the forest, we saw, for the first time, a huge, fan-shaped cloud directly west of the village," wrote Hildred Erskine, a Kodiak survivor. "It was the blackest and densest cloud that I have ever seen. Lightning frequently flashed through . . . electrical storms just do not happen in Alaska. Static was so bad that radio operators did not dare go near their instruments." It grew dark, strange for June in Kodiak, when daylight is almost continuous. "We began thinking of the fate of the people of Pompeii."

Lakes filled with the ash; ptarmigan were killed in their nesting season; trout were destroyed, and most of the island biota was, indeed, buried alive. But soon, from that ash, life began again. With the help of winds from the mainland, which brought the seeds of trees and plants that had never grown there, the island was reborn. In geologic terms, then, the surface and life of Kodiak is brand-new, a reminder that creation is the other face of death.

After Hurricane Katrina, some people said that New Orleans should be allowed to revert to its natural wetland state; the population resettled in surrounding cities on higher ground; perhaps a Bourbon Street amusement park, easily evacuated, built in that drowning pool. The wetland reversion approach is sensible, because to a degree it restores natural, protective habitat. But when people say, as they often do, that

other humans are fools if they live in a natural disaster zone, they base this on the assumption that ultimate high ground exists. Should people—you and I—be marched out of any habitat threatened by natural disaster? I don't think so. Where would we go? Where no flood ever runs or fire ignites? To the seemingly safe boot heel of Missouri, which happens to be located on a fault that once changed the course of the Mississippi River?

Nearly a century after that Katmai eruption, my son and I leave our footprints in this dark volcanic soil of renewal. Life edges back from the brink, then pushes forward again. So Matthew and I press on, up the stream, awake, more careful than we would ever be in our daily lives, listening, watching, lifting our heads to sense what the wind carries. Something is coming. So we ring the bells. And we sing.

More Senses Than We Sense

Singing for bears, or smelling them, may not be your idea of a good time, but it hints at the sensory capabilities that are in our nature, if seldom used.

Many of us desire a fuller life of the senses.

By its broadest interpretation, nature-deficit disorder is an atrophied awareness, a diminished ability to find meaning in the life that surrounds us, whatever form it takes. This shrinkage of our lives has a direct impact on our physical, mental, and societal health. However, not only can nature-deficit disorder be reversed, but our lives can be vastly enriched through our relationship with nature, beginning with our senses. In *A Natural History of the Senses*, Diane Ackerman writes: "People think of the mind as being located in the head, but the latest findings in physiology suggest that the mind doesn't really dwell in the brain but travels the whole body on caravans of enzyme, busily making sense of the compound wonders we catalogue as touch, taste, smell, hearing, vision."[4] We city dwellers marvel at the seemingly superhuman or supernatural abilities of Australian aborigines and other "primitive"

people, but consider such talents vestigial, like that remnant tailbone. Here's another view. Such senses are not vestigial but latent, blanketed by noise and assumptions.

Ever wonder why you have two nostrils? Researchers at the University of California–Berkeley did. They published their findings in the journal *Nature Neuroscience*. Jay Gottfried, a professor of neurology at Northwestern University, wrote: "What this study highlights most for me is that the human sense of smell is a lot better than many people think it is. It's true that narrow visual and auditory streams comprise the primary sensory currents of our lives. But all of our senses are capable of more than what we assume." The researchers fitted college undergraduates with taped-over goggles, earmuffs, and work gloves to block other senses, then set them loose in a field; most of the students could follow a thirty-foot-long trail of chocolate perfume and even changed direction precisely where the invisible path took a turn. The subjects also were able to smell better with two functioning nostrils, which researchers likened to hearing in stereo.[5] One researcher postulated that the brain gathers odor "images" from each nostril to construct a composite picture of the trail. The students found themselves zigzagging, a technique employed by dogs as they track.

The study also found that the students' olfactory tracking abilities improved with practice, suggesting that humans could develop the ability to match the tracking talents of many other animals. According to researcher Noam Sobel, part of the reason dogs are better at this than humans is that dogs sniff quickly. Very quickly. "We interpret these results to suggest that, as subjects increased their speed, it was necessary for them to sniff more quickly to get the same quality of information," reported Sobel. "We found that not only are humans capable of scent-tracking, but they spontaneously mimic the tracking pattern of [other] mammals."[6]

What else can we do that we have forgotten? What do we miss seeing, hearing, and knowing because we allow the tangle of technology's

wire to tighten around us a little more each day? And how can we develop these natural but obscured abilities and make them applicable to the lives we live today?

Perhaps you recall a time when you took in more of the world—you just *did* it. You were new and the world was new. As a boy, I would go out in the woods and sit under a tree, wet my thumb, and then wipe each nostril with it. I had read somewhere that people—pioneers or Indians—would do this in order to keen their sense of smell for approaching game, or even danger. I did this and held perfectly still, my back against rough bark, waiting. And, slowly, the animal life returned. A rabbit appeared under a bush, birds swooped low, an ant went on a walkabout over my knee to see what was on the other side. And I felt intensely alive.

Most scientists who study human perception no longer assume that we have five senses: taste, touch, smell, sight, and hearing. The current number ranges from a conservative ten senses to as many as thirty, including blood-sugar levels, empty stomach, thirst, joint position, and more. The list is growing.

In 2010, scientists at University College in London published the results of a study suggesting that human beings may be hardwired with an inner sense of direction.[7] Another related sense is called proprioception: the awareness of your body's position in space, including movement and balance; this sense makes it possible for us to touch our noses when our eyes are closed. Dolphins and bats might teach us a thing or two about a latent talent we share with them: echolocation, the ability to locate objects by interpreting sounds bouncing off of them. In 2009, researchers at Madrid's University of Alcalá de Henares showed how people could identify objects around them, without needing to "see" them, through the echoes of human tongue clicks. According to the lead researcher, echoes are also perceived through vibrations in ears, tongue, and bones.[8] This refined sense has been learned by trial and error by some blind people and even by some sighted individuals.

"In certain circumstances, we humans could rival bats in our echolocation or biosonar capacity," said Juan Antonio Martínez Rojas, lead author of the study. "Lots of things, like an empty room, don't make a sound, but they do structure it. They give it shape, which people can see without seeing. I have had students listen to sounds broadcast between two boards and be able to tell me whether there was enough space between the boards for them to fit through." Human echolocation can be done without technology or "without having to develop any new mental processes," according to Lawrence D. Rosenblum, a professor of psychology at University of California–Riverside. To him, it's all about "hearing" a world that exists beyond what we normally mistake for silence.[9]

Karen Landen hears that world. A former newspaper editor, Landen had been a birder many years when, on field trips, she noticed a few people had an uncanny knack for detecting and identifying birds. These "superbirders," as she calls them, were, in a sense, seeing with their ears. How? They had taken Seattle Audubon's Birding by Ear course, taught by professional birding-tour leader Bob Sundstrom. Landen had studied singing and languages, so she thought "bird" would be easy.

She soon understood why most students were repeaters: "Unlike human language, birds don't have rules. We studied pages of song types—think whistle, squawk, whinny, rattle, chatter, trill—and qualities—clear, liquid, metallic, raspy, burry, sweet. You listen for a pattern: number of beats, duration, simplicity/complexity, repeated phrases. Are notes ascending or descending? Are there pauses, or one long breath? The songs of a robin and black-headed grosbeak sound alike until you notice that the robin's notes are distinct and the grosbeak's slurred (hence the grosbeak's song described as 'drunk robin')."

She also learned that some birds are instrumentalists, others are composers: "Woodpeckers drum, and a hummingbird's wings 'hum.' A young song sparrow may sing a basic phrase, but an older one with

prime territory will throw in extra flourishes to advertise his status. On top of that, species' sounds vary by region and by individual, just like us." What Landen learned was that birding starts with one sense, which leads to an opening up of other senses. A superbirder learns to see birds first, then learns to hear them, and then to "see" them by hearing them. "When you bird by ear, you learn that there's a whole life story going on out there. Calls warn of predators. A male sings 'no trespassing' to other males but also, 'hey, ladies, here's a handsome, successful guy who'll make a great family man.' " She laughs. "You know how when you wake up at the tail end of a dream, if it was a good one, its memory creates a rich extra layer that hovers over your day? Well, birding by ear creates this luscious extra layer in life that just rises above the day-to-day. I can't imagine a life without birds, without their beauty, their spiritedness, and their song. That would be a poverty of the senses."

This brings us to the so-called sixth sense, which to some means intuition, to others extrasensory perception, and to still others, the human's ability to unconsciously detect danger.

In December 2004, as the devastating Asian tsunami approached, Jarawa tribespeople, along with some animals, reportedly sensed or detected sounds from the approaching wave, or other unusual natural activity, long before the water struck the shore. They fled to higher ground. The Jarawa used tribal knowledge of nature's warning signs, explained V. R. Rao, director of the Anthropological Survey of India, based in Kolkata. "They got wind of impending danger from biological warning signals, like the cry of birds and change in the behavioral patterns of marine animals." [10] In the Jarawa's case, the simplest explanation may be that the sixth sense is the sum of all the other senses put together, combined with everyday nature-knowledge.

Researchers at Washington University in St. Louis point to the anterior cingulate cortex, the brain's early warning system, which is better at picking up subtle warning signs than scientists had previously

thought. Joshua W. Brown, director of the Cognitive Control Lab, Indiana University–Bloomington,[11] coauthored a study reported in 2005, in the journal *Science*. "It makes sense that this mechanism exists because there are plenty of situations in our everyday lives that require the brain to monitor subtle changes in our environment and adjust our behavior, even in cases where we may not necessarily be aware of the conditions that prompted the adjustment," he wrote. "In some cases, the brain's ability to monitor subtle environmental changes and make adjustments may actually be even more robust if it takes place on a subconscious level."

Ron Rensink, an associate professor in both psychology and computer science at the University of British Columbia, has investigated the sixth sense, which he calls "mindsight," as a way to understand how people can have accurate "intuition" that something is about to happen. "In a way, it's like a 'first strike' system . . . that we use without conscious thought," Rensink told the *Monitor*, the journal of the American Psychological Association.[12] His research suggests that vision is, in fact, a collection of abilities, not just one sense—and that the brain can receive, through light, a kind of preimage vision. In the University of British Columbia's monthly newspaper, *UBC Reports*, he explained: "There is something there—people do have access to this other subsystem. . . . It turns out these are two very different subsystems—one of them is conscious, one of them is non-conscious—and they actually work slightly differently. . . . In the past, people believed that if light came into your eyes, it would have to result in a picture. If it didn't result in a picture, it must mean that it can't be vision. " On the contrary, he wrote, light can enter your eyes and be employed by other perceptual systems. "It's just another way of seeing."[13]

In separate research, the U.S. military has studied how some soldiers and Marines can apparently use their latent senses to detect roadside bombs and other hazards in war zones in Afghanistan and Iraq. "Military researchers have found that two groups of personnel are par-

ticularly good at spotting anomalies: those with hunting backgrounds, who traipsed through the woods as youths looking to bag a deer or turkey; and those who grew up in tough urban neighborhoods, where it is often important to know what gang controls which block," reported Tony Perry of the *Los Angeles Times*.[14]

A common factor seemed to be at work: plenty of experience outside the home and outside the electronic bubble, in an environment that *demands* better use of the senses. Army Sgt. Maj. Todd Burnett, who has served in Iraq and Afghanistan, conducted the research. The eighteen-month-long study of eight hundred military personnel at several bases found that the best bomb-spotters were rural people, familiar with hunting, who signed on with the South Carolina National Guard. According to Burnett, "They just seemed to pick up things much better. . . . They know how to look at the entire environment." And the other young soldiers, the ones who were raised with Game Boys and spent weekends at the mall? By and large, these enlistees lacked the ability to see nuances that might enable a soldier to spot a hidden bomb. Even with perfect vision, they lacked the special ability, that combination of depth perception, peripheral vision, and instinct, if you will, to see what was out of place in the environment. Their focus was narrow, as if they were seeing the world in a set format, "as if the windshield of their Humvee [was] a computer screen," Perry wrote. Sgt. Maj. Burnett put it this way: The gamers were "focused on the screen rather than the whole surrounding."

The explanation may be partly physiological. Australian researchers suggest that the troubling increase in cases of myopia—nearsightedness—is linked to children and young people spending less time outdoors, where eyes are conditioned to focus on longer distances.[15] [16] But more is probably going on here. Vision, including mindsight; more acute hearing; an attuned sense of smell; a sense of where one's body is in space—all of these abilities could be operating simultaneously. In a natural environment, this advantage offers practical applications and

benefits: one is an increased ability to learn; another is an enhanced capability to avoid danger; and still another, perhaps the most important application of all, is the measurement-defying ability to more fully engage in life.

Beyond proprioception, that awareness of our body's position through movement and balance, nature also offers us the opportunity to realize an even larger sense—the position of our body and spirit in the universe and in time.

One day, my son Matthew wondered, "Is faith a sense?"

"What do you mean?" I asked.

"You know, as in sensing a higher power?"

This is a wonderful question, and it leads to other questions: Could a literal sense of spirit exist on the far edge of our senses, out where the flat earth stops and all that is beyond and within begins? Might this particular sense be activated by the other senses, when they're working at full throttle—which often occurs when we are in nature?

Perhaps this sense, if it is one, is why so many of us use religious terminology as we talk about our experience of nature, even if we're not religious in a formal way.

Nature writer Robert Michael Pyle, who coined the elegant phrase "the extinction of experience," asks: "What happens to a species that loses touch with its habitat?" Our sensitivity to nature, and our humility within it, are essential to our physical and spiritual survival. Yet, our growing disconnection from nature dulls our senses, and eventually blunts even the sharpened sensory state created by man-made or natural disaster. Spending time in nature, particularly in wilderness, can pose physical dangers, but rejecting nature because of those risks and discomforts is a greater gamble.

The Humility Sense

On that Alaska stream, where the red sockeye moved against the current and the forest leaned inward over cut banks, the potential of a bear

in those bushes presented a danger. At the same time, our awareness gave us protection and excited our senses to everything around and above and in that stream. It offered us something larger, too: a sense of natural humility.

Far across an open plain, a bear was running toward us. Joe suggested that we stand together. "We'll look like one big animal with a lot of legs," he said. This seemed a sensible recommendation. It was not lost on me that the Kodiak brown bear, isolated on the Kodiak Archipelago for twelve thousand years, is the world's largest land carnivore, weighing up to seventeen hundred pounds.

"Let's back away from the water," said Joe.

The bear crossed in front of us and leaped into the bend of the river where we had just crossed. We watched in awe. Young but impressive, the bear pounced and swiped at the migrating salmon, and occasionally lifted his nose and bobbed his head and looked our way, then went back to his fishing.

"He has to make a living, too," Joe said.

I glanced at Matthew, who clutched his can of pepper spray. Irrationally, I felt a surge of joy that outweighed any concern about safety. How fine it is, I thought, for Matthew to experience this moment, with its beauty and imposed natural humility. The pleasure of being alive is brought into sharper focus when you need to pay attention to *staying* alive. Alive in the larger universe, alive in time.

Kodiak Island, with more bears than human residents, is one of the last wild places on the planet where human beings can feel that peculiar constriction of flesh on the back of the neck that occurs only when one is in another predator's environment. Even those who live in less-developed areas of the world know such moments are growing rare. In his 2003 book *Monsters of God*, David Quammen predicts that by the year 2150, all the world's top predators will either be wiped out or in zoos, their genetic pool dwindling, their fierce possibility caged. Then, he writes, people "will find it hard to conceive that those

animals were once proud, dangerous, unpredictable, widespread and kingly. . . . Children will be startled and excited to learn, if anyone tells them, that once there were lions at large in the very world." And tigers, and bears.

In rare cases, large predators are on the rebound. After being decimated by hunters in the 1940s, and subsequent efforts to protect it, the Kodiak bear population is stable and possibly increasing. In Southern California, the number of mountain lions has grown dramatically since the state banned lion hunting in 1990. However, an accurate mountain lion count grows more elusive because of the "shoot, shovel, and shut up" mentality of: ranchers who sometimes conduct their own kind of animal control. Wolves reintroduced in Yellowstone face a similarly questionable future. We no longer hear much about human population control, just wildlife control.

In wilderness, and in natural cases or even natural urban parks, we find our senses—but can we come to them in time? Even if human beings never encounter predator species (other than humans), their protection of wildlife preserves or restores part of our humanity. It nourishes the remnants of our deeper senses, especially the sense of humility required for true human intelligence.

On Kodiak, a piece of that frontier survives—a kind of Jurassic Park with salmon. Another day, my son and I watched a different bear move quickly up a small ridge, straight for a cluster of the island's wild, or feral, horses. Perhaps it hoped to take the little white colt from them. Remarkably, the horses (more dangerous to people than were the bears, Joe told us), led by a strong palomino, ran directly at the bear. As the horses raced forward, tails flying like flags, the bear considered a different plan.

The wild horses stopped and stood together and watched, and so did we, as the bear ambled along the beach and disappeared into the fog. The horses went their own way, into the same fog. Then we were alone on the plain.