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# INTRODUCTION

## Giving Voice to the Snow Leopard

### THE PEOPLE

High in the lofty peaks of central Asia, a rare, elusive cat sits curled on a rocky ledge overlooking a deep, rugged valley. A cold wind wisps frozen snow into the thin air, creating a dazzling silver shower against a brilliant azure sky. It's quiet up high, just the occasional crack of a distant glacier, a few rocks dancing down the shoulders of near-vertical mountains. Across the valley, a herd of blue sheep, the cat's favorite food, grazes peacefully on a steep southern slope. Piercing feline eyes are fixed on nothing but see everything. There are no people in sight, just miles and miles of snow-clad peaks in every direction—a sign that all is well at the roof of the world. The big cat rises contentedly, rubs at the knees of the mountain gods, then disappears. Tracks, vanishing into the snowy mist, are the only evidence it was really there. This near-mythic beast is the snow leopard, the highest mammalian predator and symbol of all that is free and truly wild in the mightiest mountains on earth—its presence, its aura, a living soul given to citadels of stone and ice.

Like no other large cat, the snow leopard evokes a sense of myth and mysticism, strength and spirit. A mystery cat shrouded in a snowy veil, seldom seen but always present. To the West, the snow leopard is a cat of strange, foreign lands, a prowler of high peaks, symbol of survival in the high mountains. To Asia, the snow leopard is embedded in ancient lore and lately has become the symbol of unity and conservation in a region Marco Polo described as "noisy with kingdoms." For local people who share its mountain realm, there is respect and fear. Not personal fear, for the snow leopard doesn't harm humans, but fear of the occasional night stalker that kills precious livestock, the literal lifeblood of existence for those hardy souls who share the snow leopard's world.

The snow leopard is endangered, imperiled by ever-growing human encroachment into its mountainous world. Even with international protection, it is still killed for its bones and luxuriant fur or in retaliation for killing livestock. Climate change adds another dimension of stress to the snow leopard's world, warming the great mountains, pushing the snow leopard and its prey higher and higher. Like the polar bear and Arctic ice, the snow leopard's habitat is sharply defined with no options for retreat or alternative refuge—the balance of life is easily degraded but not easily restored. Beyond the mountaintops lies extinction.

Strangely, the snow leopard ranks high among notable rare animals—alongside the bald eagle, polar bear, lion, tiger, and panda—yet it is perhaps the least studied and certainly the least written about. There is a good reason why we know so little about the snow leopard. Its support system is a delicate veneer of vegetation draped over the highest and most rugged landscapes on earth. And the great mountains are not always a friendly place. For centuries, treacherous travel, rugged terrain, ageless border disputes, and political intrigue have kept this region of the world from in-depth study. The seven great ramparts of central Asia present one of the most formidable and foreboding environments in the world. Their names alone evoke a sense of wonderment: Altai, Pamir, Tien Shan, Kun Lun, Hindu Kush, Karakorum, and the mighty Himalaya. Here, in the land where the snow leopard finds comfort,

humans can suffer frostbite and sunburn at the same time. Anyone who has traveled in this region will attest that half the enterprise (and half the adventure) is just getting around these impressive giants of the world. When Sir Francis Younghusband crossed the India-Tibet border en route to Lhasa in 1903, his soldiers were supported by 10,000 coolies, 7,000 mules, 4,000 yaks, and 6 camels. Today, border disputes, bandits, bureaucrats, bad roads, and bad weather still persist, about the same as they were centuries ago. The only difference from days of old is the mode of travel; the travelers are the same—adventurers, peregrines, dacoits, seekers. These conditions keep away the less hardy and the faint-of-heart and make the snow leopard one of the most difficult and expensive animals on earth to study.

But extraordinary animals attract extraordinary people. It is possible to study the naked mole rat, monkey-faced mussel, or myriad other creatures without becoming emotionally attached. This is not the case with snow leopards, however. Scientists who work in central Asia are driven by more than just the science. True confessions expose an overwhelming urge to feed twin desires of scientist and adventurer. To study the snow leopard is as much bold adventure as scientific expedition. The high places attract two kinds of adventurous spirits: those who drink in the moment and move on, and those who are moved deeply by an awesome connection with something beyond human description. The latter cannot leave behind only footprints. Their souls would not bear it; they must in some way tithe to the spirit mountains, the spirit cat—in time, deeds, words.

Renowned field biologist Dr. George B. Schaller first saw a snow leopard in 1970 while on an expedition in Pakistan's Chitral Valley. He was studying the Himalayan blue sheep or bharal, a half-sheep, half-goat biological oddity and favored prey of the snow leopard. In the previous twenty-five years, only he and one other westerner had laid eyes on the snow leopard in the wild. He later returned to Chitral in hopes of radio-collaring several leopards to learn about their secretive habits. It was too late. In less than four years, almost all the cats in the area had been shot or

trapped for their luxurious and valuable pelts, an all-too-common story throughout the snow leopard's range. In his book *Stones of Silence,* Schaller conveyed his reverence for the snow cat, "a rare and elusive creature which lured me on, only seldom permitting a glimpse." The book's title has become a common metaphor of foretelling should the snow leopards cease to exist.

In his book *The Snow Leopard*, Peter Matthiessen brought this mystical cat out of lore and obscurity into the light of the world. In 1973 he and Schaller set out for northwestern Nepal, near the Tibetan frontier, to again study the bharal and again with hopes of seeing the elusory snow leopard. They spent many months in the Land of Dolpo on the Tibetan Plateau among the people and prey of the snow leopard. The ensuing months yielded only a tantalizing glimpse of the "ghost of the mountain" for Schaller. Matthiessen did not see the snow leopard at all; nonetheless, inspired by the legendary cat and drugged by the thin pure air of the Himalayas, he wrote about their journey. His book revealed much about a man's spiritual search for enlightenment in a land so physically close to the heavens.

Eight years later, Rodney Jackson embarked on the first scientific expedition aimed at studying the snow leopard. His study site, the rugged Langu Valley in western Nepal, was sixty miles from anywhere—truly a *Never Cry Wolf* adventure on the other side of the world. Conducted in terrain hardly suitable for goats, through monsoon rains and the worst winter in Nepal's history, his valiant research established a critical base of scientific data on the endangered cat. Jackson was the first person to capture and radio-collar a snow leopard. He received a serious bite in the process, which almost ended the study before it began. The adventure inspired Darla Hillard's book *Vanishing Tracks,* a compelling story of love and adventure among the endearing mountain people of Nepal and beneath the snow leopard's gaze.

In 1986 Rodney Jackson and Darla Hillard drove an ancient Honda Accord with 220,000 miles on it from Sonoma, California, to Fort Collins. Against incredible odds and hardships, Rodney had just completed the first scientific study of the snow leopard in

Nepal's remote Langhu Valley, high in the Himalaya Mountains. With four years of telemetry data on five radio-collared snow leopards, he had sought me out to help analyze his data using GIS. I was honored to help, and it was a delight to meet Rod and Darla and hear firsthand of their work and adventures in Nepal. *National Geographic* had published their story just before their visit. Although I did not know it at the time, their friendship and influence put legs under a college daydream.

In the many kingdoms visited by Marco Polo, it was tradition for neighboring rulers to lavish gifts—the more exotic the better—on each other during state visits, so rare and unusual wildlife were common in the courts of Asia's ruling aristocracy. The great Genghis Khan had a personal zoo of exotic species collected from or gifted by distant sub-kingdoms. In the 1970s the two noisiest kingdoms were the United States and the Soviet Union, during the height of the Cold War era. In 1972 Richard Nixon opened relations with China and warmed relations with the Soviet Union, launching a period of détente between the countries. China sent the United States two rare and famous giant pandas. Just prior to Nixon's 1972 visit to the Soviet Union, Seattle's Woodland Park Zoo acquired two rare snow leopards from Kirghizia. They were named Nicholas and Alexandra, after the last imperial family of Tsarist Russia.

These two cats fell under the watchful eye of a devoted volunteer at the zoo, Helen Freeman, a serendipitous encounter for both the cat and the woman. As I stated earlier, extraordinary animals attract extraordinary people. Helen spent hours and hours observing the cats and researching what she could about how to care for them. At the time, little was known about them. Her desire to help the new visitors quickly turned to aiding the species as a whole. In 1981 she founded the Snow Leopard Trust (SLT), the first nongovernmental, nonprofit organization devoted to snow leopard conservation. Through the SLT she took her campaign to zoos around the world but, more important, to the countries with the snow leopard. Blessed with a maternal persistence and genuine ease with people, Helen attracted financial support from Seattle's social elite and earned the trust of local village heads half a world away. I

traveled with Helen on several occasions and marveled at her dedication, passion, and persistent charm. To help the snow leopard, she changed governments, changed old attitudes, and surmounted cultural divides. In Peshawar, Pakistan, I saw her genuine passion and charisma disarm an entire room of exclusively male Muslim counterparts. This experience taught me to never underestimate the power of passion or the fact that in some cultures a stone-faced countenance often hides a compassionate heart.

Her work wasn't without personal sacrifice. Peshawar is a city where sweltering heat magnifies unabated pollution, horrible conditions for Helen's rare lung disease. Though weakened and distressed during our time in Peshawar, Helen never missed a meeting or complained. She was a quick study of people and the conditions needed to have a positive effect on snow leopard conservation. Her story "Kashmir," reprinted in this volume, exemplifies the grit, determination, and sense of wonder that was Helen Freeman. But very little was known about snow leopards when she started the SLT, especially in those far-off countries with strange names and people. Helen died in 2007, leaving behind a legacy of accomplishments that make her one of the great voices for snow leopards.

Helen was naturally drawn to Rod Jackson, the world's first snow leopard specialist. Rod and his wife, Darla, helped launch many of the SLT's early programs before setting out to establish their own institutional voice for the snow leopard: the Snow Leopard Conservancy (SLC). Focused at the community level, the SLC promotes local stewardship of the snow leopard and its prey.

In an effort to fill the paucity of data on the snow leopard, Dr. George B. Schaller initiated a live animal study in Mongolia in 1992, partnering with Dr. Jachingyn Tserendeleg, director of the Mongolian Association for the Conservation of Nature and Environment. Together they began a study in the South Gobi that was eventually turned over to Tom McCarthy, an Alaskan grizzly bear biologist. Tom and his team collared and monitored five snow leopards, one with a satellite collar. This study revealed new information on the snow leopards' movements and home range requirements.

There have been a handful of other studies on the snow leopard; several are mentioned in the stories that follow. Snow leopards are no less difficult to study than they were in the early years, still requiring a hearty constitution suited to high, cold places. But the way snow leopards are studied has changed considerably, and the number of dedicated organizations has grown as well. Today, new advances in DNA analysis and remote camera trapping point to a promising future in which the cost of studies will become more reasonable and the need to capture live animals greatly reduced—technology intertwined with old-fashioned fieldwork.

To this end, Tom McCarthy returned to the South Gobi in 2008 to set up a long-term research program on the snow leopard. This time as SLT's science and conservation director, he partnered with other organizations to establish Camp Tserendeleg, named to honor Dr. Jachingyn Tserendeleg, who passed away in 2001. The camp is a fitting homage to a wonderful person, an internationally recognized conservationist, and a great friend and voice of the snow leopard. The only active research camp in snow leopard–range countries, it is perhaps fitting that it is in Mongolia where only a little more than twenty years ago it was possible to hunt snow leopards for trophy. Today, the camp hums with the activity of a multinational cadre of researchers and volunteers conducting state-of-the-art research on the snow leopard. A model for other countries, Camp Tserendeleg stands as a vanguard of hope for the snow leopard's future.

## NATURAL HISTORY OF THE SNOW LEOPARD

After breaking from Madagascar about 90 million years ago, the India Plate sped across what is now the Indian Ocean, colliding with the Eurasian Plate 40 million years later. The India Plate moved faster—inches per year—than any other plate, perhaps explaining why geologists consistently characterize the melding of India with Asia as a "collision." After the collision and for the next 50 million years the two continental plates partook in a geologic rodeo, pushing, grinding, buckling, and eventually forcing

upward the greatest collection of mountains the earth has ever known. Awestruck explorers proclaimed this landscape of high peaks the "roof of the world" or the "third pole." Seven great ramparts that intertwine twelve central Asian countries include all fourteen of the earth's 26,000+-foot peaks and the vast Tibetan Plateau, with an average elevation of 14,500 feet and a vital watershed to one-fifth of the world's population.

The subcontinent came to Asia a virtual Noah's Ark of wildlife, including a unique assortment of animals that evolved as the mountains grew, adapting to a frosty band of life between permanent ice and tree line. With tens of millions of years to adapt, this snowy Eden evolved predator and prey highly specialized for life in high places. Wild yak, kiang or wild ass, and the Tibetan antelope flourished on the high plains of the Tibetan Plateau. In the rugged high mountains, an assortment of wild sheep and goats found sufficient forage to thrive on south-facing slopes, migrating up and down with the seasons. To keep these herding species in check, nature provided a coursing predator, the wolf, and a stalking predator, the snow leopard. Eventually, in only the last few thousand years, human beings—the ultimate predators—would invade these high reaches. They evolved with a hearty skill for survival and clever ingenuity for eking out a living in high, high places where every blade of grass struggles for life. Until the last few hundred years, life there was difficult but harmonious between human and animal denizens.

Ecologically, the snow leopard ranges throughout more than 1.2 million square miles of high plateau and rugged mountains, an area roughly the size of the western United States. Politically, these ranges fall within twelve countries: Uzbekistan, Tajikistan, Russia, Pakistan, Nepal, Mongolia, Kyrgyz Republic, Kazakhstan, India, China, Bhutan, and Afghanistan. China alone contains about 60 percent of the snow leopard's suitable range. Few species contend with such a varied physical and political landscape. In the halls of government the species is revered, protected (at least on paper), and used to symbolize cross-border conservation unity. On the ground, the snow leopard continues to lose habitat as new

roads and pastoral expansion bring more and more humans into its once peaceful world. With more than 600 snow leopards in zoos, no more are being taken from the wild.

Though defenseless against political influences, the snow leopard is extremely well adapted for living in higher altitudes, typically between 11,500 and 23,000 feet above sea level. Its big chest and large nasal cavity help accommodate maximum oxygen intake. Long legs, snowshoe-like paws, and a long tail help this big cat cruise deep snow and steep, rugged terrain. Its exceptional tail helps with balance when the animal is bolting up to thirty feet across boulders, and it provides warmth when curled around the body. Weighing in at 60 to 120 pounds, snow leopards are formidable-sized cats and, like most cat species, are efficient killers. Unlike lions and tigers, snow leopards have never been known to harm humans. Some experts speculate that their fear of humans is a result of the relatively short, limited exposure snow leopards have had to upright walkers. Even in remote mountain villages, residents may never see a snow leopard in their lifetimes. Unfortunately, snow leopards occasionally stray from their normal diet of wild sheep and goats, taking domestic stock. In an enclosed stock pen filled with sheep or goats, a single snow leopard can kill over 100 animals in one night—a devastating financial loss for the unlucky family. Crepuscular, they prefer hunting in late evening and early morning. Their smoky-gray fur with black spots and dark rosettes matches their surroundings, creating the perfect cloak for the ghost of the mountain to play tricks on the inferior human eye.

These cool cats are mostly loners, coming together only for mating, which may take just a week. Territories are marked heavily to avoid conflict and define boundaries: using their hind feet, snow leopards scratch shallow indentations called scrapes along travel corridors, often leaving scat or urinating on the scrape. They also cheek-rub and spray scent on overhanging rocks to forewarn other cats of territorial boundaries. The mating season is timed to coincide with prey abundance: mating occurs in January through March, and gestation lasts about 100 days, at which time two to three cubs are born in a secluded cave or crevice. The peak birthing

period is May or June, which coincides with the greater abundance of newborn sheep and goats. Cubs are fully reliant on the mother as provider and teacher for eighteen to twenty-two months.

The snow leopard's world is seasonal, and like all predators they must follow their prey. Spring and summer is the time of new cubs, a time of abundant prey that migrates to higher-elevation pastures. In the fall, prey moves lower down the valleys. For females with cubs, especially last year's cubs now about a year-and-a-half old and nearly the size of adults, there is greater demand for hunting. Winter is the difficult time, a frozen landscape of white and gray. Winter coats grow up to 4.5 inches of new hair to hold in warmth. Prey are lower and in tight herds, but they are more wary and deep snow makes hunting more difficult. This is also the time of greatest conflict with humans, especially if natural prey is gone or scarce. On rare occasions, hunger or simply a unique opportunity causes snow leopards to kill domestic animals. Local villagers, also surviving marginally, are compelled to kill the night stalker.

Though protected under the Convention on International Trade in Endangered Species and the Endangered Species Act, snow leopards continue to fall prey to deliberate poaching for bones and skin, loss of habitat, and lack of adequate parks and protected areas. Luckily, a growing number of organizations have stepped up efforts to reduce human conflict with local villagers and have brought incentive programs for active community-level conservation. Although estimates of the overall total number of snow leopards range from 4,500 to 7,500, the real threats to the species are at the population level, where competition is keenest between cats and humans. In addition, the snow leopard faces a new threat: climate change. Given its narrow, fragile life zone, it stands to reason that climate change, especially global warming, will accelerate the species toward local extinction. Just as polar bears are affected by the latitudinal, *pole-ward* warming of the Arctic, snow leopards are susceptible to the altitudinal, *upward* warming of higher elevations.

As the high mountains warm, the snow leopard and its prey will try to adapt, but suitable habitat is finite—there is no place beyond the mountaintops. Warming in Asia's high mountains will

cause glaciers to retreat and alter rainfall patterns; as growing seasons lengthen, grassland will migrate upward. These conditions let local pastoralists linger higher and longer in mountain pastures, which in turn pushes snow leopards and their prey into higher, less productive, more precipitous mountain terrain. In many locations these changes decrease historic range, forcing snow leopards into unsuitable habitat and shrinking their already limited range. These conditions also set the stage for conspecific competition with cats of traditionally lower elevations, such as the clouded leopard and tiger. Local extinctions are a certainty. Many of today's leading experts on snow leopards believe these extinctions are already occurring.

The fate of the snow leopard rests in the hands of the local people who share their world. They are not alone, however, in the struggle to coexist with the snow leopard. They are helped by a cadre of extraordinary people driven to protect this rare cat and its fragile world. In the stories that follow, these people speak on behalf of the snow leopard. Read slowly and linger for a while above the clouds where a rare cat lives.