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Abstract: The elusive Central Asian snow leopard steps into a risk-filled future.
Out of the Shadows

The elusive Central Asian snow leopard steps into a risk-filled future.

Snow leopards don't care much for company. So to get close, photographer Steve Winter deployed a series of camera traps that automatically snapped pictures whenever an animal entered their field of view. The result is a set of intimate portraits that expand our vision of a legendary mountain recluse.
Rudy, Scorch, Orange, Delicate—a snow leopard marks its trail with often pungent graffiti. The scent helps these solitary cats avoid confrontation with territory rivals. During mating season, males use the scent as a magnet. As few as 3500 of these endangered cats may survive in the wild.
When a snow leopard stalks prey among the mountain walls, it moves on broad paws with extra fur between the toes, softly, slowly, "like snow slipping off a ledge as it melts," Raghu says.

"You almost have to turn away for a minute to tell the animal is going anywhere. If it knocks a stone loose, it will reach out a foot to stop it from falling and making noise." One might be moving right now, perfectly silent and perfectly tensed, maybe close by. But where? That's always the question. That, and how many are left to see?

Raghu Raminder Singh Chunawah has watched snow leopards as often as anyone alive. The New Delhi biologist studied them closely for five years in Hemis High Altitude National Park in Ladakh, the largest, loftiest district of northern India, and carried out wildlife surveys in the region over nine additional years. We're in the 1,300-square-mile park this evening, setting up camp in a deeply cleft canyon near 12,000 feet. It's June, and the blue sheep have new lambs.

We keep one eye on a group crossing a scree slope, the other eye on the cliffs at its top. Leopards are ambush hunters that like to attack from above. While the common leopard of Asia and Africa relies on branches and leaves for concealment, the snow leopard loses itself among steep jumbles of stone. This is exactly the kind of setting one would favor. But I'm not holding my breath. Raghu has sighted only a few dozen in his whole career.

Lengthening shadows coalesce into dusk.

Wild roses perfume the Himalayan canyon as passing squalls brush the ridgetops with new snow. I imagine a leopard eating down the darkened slopes. It flows low to the ground, with huge gold eyes and a coat the color of dappled moonlight on frost. The body stretches four feet from nose to rump. Its tail, the most striking in the feline family, is almost as long, and so thick and mobile it looks as if the cat is being followed by a fuzzy python. The snow leopard sometimes uses its tail to send signals...
Invoking values of nonviolence and respect for life revered by monks and other Buddhists, the Dalai Lama has called for an end to snowleopard killings. They continue because hides and other parts are lucrative items across most of the cat’s range.
perfectly utilizes mere dose of

right now, practically silent and

A car might be moving
Droppings, together with scapes made by the rear legs, reveal habitual routes that tend to follow ridgelines or the base of cliffs. Scrambling for footing day after day, I gradually realize that these travelers like to mark the same type of features that draw my attention en route: solitary boulders, sharp corners along gullies, knolls, and saddles. Near tree line, they stripe the occasional trunk with long, vertical claw marks.

If my eyes are too busy taking in scenery to notice a fresh scrape, my nose will still register the acrid tang of leopard pee. Elsewhere, I'll catch a musky aroma sprayed from anal glands up onto an overhanging rock. Frequently used scent posts take on an oily sheen. Passing cats stretch to rub their cheeks against them, leaving white hairs for me to tuck in a pocket for luck scaling the next rock face. Fifteen, sixteen thousand feet, no matter how far up I climb, some village will have gone higher and left stone cairns bearing prayer flags or stacks of horns. Later, the cats come by and leave their own markings on these offerings. "A lot of research on snow leopard movements really tells you more about the limits of human abilities," says Raghu after crossing a cascading alpine stream with glacial melt. "You can only climb so many slopes before you get exhausted or encounter sheer cliffs. It is just not possible to keep up." So Raghu tried capturing the cats to attach radios to them. He finally colored a female. But, like previous investigators, he was seldom able to monitor a signal for long because the animal dropped behind some ridge that blocked the transmission.

Over the years, biologists reported snow leopards covering territories of five to fourteen square miles. But when American biologist Tom McCarthy first placed a satellite collar on one in Mongolia in 1996, he found it roaming 386 square miles. "My guess is that the more satellite collars we get on, the larger we'll discover snow leopard territories to actually be," said McCarthy, now the science and conservation director of Snow Leopard Trust. Ten years passed before the next satellite tag was put on, again by McCarthy, this time in Pakistan. By mid-2007
the cat wearing it had revealed its movements over a 115-square-mile area and had moved across the border into Afghanistan.

**SNOW LEOPARD RESEARCHERS** need to gather more than cat facts, because you can neither understand nor save a predator without doing the same for its prey. Snow leopards hunt chiefly Asia's high-country array of hoofed wildlife: ibex, argali and urial sheep, blue sheep, tahr, the goat-antelopes known as goral and serows, Tibetan antelope, Tibetan and goitered gazelles, musk deer, red deer, wild boars, wild yaks, and wild Bactrian camels. Marmots, hares, and mouse hares (pikas) are on the menu too, along with partridges and turkey-size snow cocks. On top of everything else, snow leopards routinely add the tall, feathery shrub *Myricaria* and other plants to their diet. Curious, but then my house cat swallows grass and loves cantaloupe.

As the top carnivore of the alpine and subalpine zones, the snow leopard strongly influences the numbers and whereabouts of hoofed herds over time. That in turn affects plant communities and thus shapes the richness of many a smaller organism down the food chain. The leopard's presence—or absence—affects competing hunters and scavengers too, namely wolves, wild dogs, jackals, foxes, bears, and lynx. This cascade of consequences makes *Uncia uncia* a governing force in the ecosystem, what scientists term a keystone species.

Since the range of the snow leopard overlaps those of so many other creatures, protecting its habitat also preserves homes for the majority of mountain flora and fauna. While we were exploring part of the Zanskar Range in Ladakh, Raghu and I crossed tracks that sent him racing off to an overlook. A few minutes later, a brown bear—the same species as North America's grizzly—galloped and slid down a high riverbank, swarms across surging rapids, muscled halfway up a cliff wall, and finally lay down to dry its silver-tipped fur in the warm morning sun. We had found one of the last few dozen
of its kind in that huge section of the Himalaya. Do snow leopards attack humans, as bears sometimes do? No, never, Raghu says. He once watched a village girl pulling on one end of a dead goat, unaware that the other end, hidden by a bush, was snatched in a snow leopard’s jaws. She came away unscathed. But a single leop- ard swathet in a herd of livestock can plague a family into desperate poverty.

Because farming is marginal at best in Central Asia’s cold, dry landscapes, traditional cultures depend mainly upon livestock to get by. Some herders operate from mountainside hamlets. Others are nomadic, migrating long distances between seasonal pastures. Either way, snow leopard conflicts come with the lifestyle. Wired to select the unwary and the stragglers among wild ungulates, the cats can hardly help picking off a few domesticated versions. At night, when flocks are stuffed into low stone corrals, a leap- ard can all too easily hop in to join them.

During a several-day trek through the Sham area of the Ladakh Range, which rises to the north of the Zanskar Range, on the other side of the Indus River Valley, Jigmé Dadul, a conservationist, and I made our way over the passes to the barley fields and poplar groves of the village of Ang. There we looked up Sonam Namgili. Three

When Namgili opened the door, he found wide golden eyes staring back.

Overgrazing by livestock also reduces the natural capacity of rangelands to support native herds. Hungry leopards turn to the same flocks for food, and angry herdsmen kill the cats in retali- ation. With little or no government enforcement of wildlife regulations in remote areas, a protec- tion strategy has little chance of breaking these cycles unless it gains local support.

Religious leaders have recently spoken up on the leopards’ behalf. Within the mountain- ranged courtyard of the Rangdum monastery, between the Zanskar Range and the main Himalaya, Tsering Tundup, a Buddhist monk, said, “Whenever we have an opportunity, we talk to people and encourage them not to kill any being.” Several people told me that the villagers listened when a lama farther up the valley condemned a spate of revenge shootings of snow leopards. Soon afterward, a new lotus- shaped shrine was built with the herdsmen’s guns cemented inside.

The Dalai Lama, leader of Tibetan Buddhism, who is widely followed in Central Asia, has specially urged followers to safeguard snow leopards and avoid wearing their pelts as part of traditional festive clothing. “People depend upon animals, but we must not use them for our luxury,” he told me during an interview in Washington. “Wild ani- mals are the ornaments of our planet and have every right to exist peacefully. Some, including snow leopards, are quite rare and visible only at high altitudes. So we need to pay special attention to protect them.”

Financial incentives can also make a differ- ence. Jigmé Dadul’s employer, Snow Leopard Conservancy–India, had helped set up Himala- yan Homestays, a program that steers trekkers to the houses of herdsmen who agree to protect snow leopards and their wild neighbors. For a clean room and bed, meals with the family, and a warm introduction to their culture, visitors pay about ten dollars a night and save carrying a tent and food. Having guests once every couple weeks through the tourist season provides the hosts with more than enough income to replace stock lost to predators.

The conservancy donates funds to cover livestock pens with stout wire mesh. Rodney
Their big eyes are so well adapted for low-light vision that snow leopards can hunt in near total darkness—but they can still go hungry when humans compete for their prey. Though trophy hunts for wild sheep and goats bring income to local communities, they can deplete food stocks for snow leopards.
That tail—fluffy as a muffer and almost body length—helps a snow-leopard stay warm and keep its balance in harshest winds. These predators also help keep mountain ecosystems in balance by reducing the numbers of large sheep and other herbivores that otherwise might overgraze alpine grasslands.
Jackson, the pioneering snow leopard researcher who founded the conservancy, says, "We figure each project to predator-proof the corrals of a village this way saves an average of five leopards." The organization also launches small-scale livestock insurance programs and provides seed money for parachute cafes—takeout tea shops beneath an shady surplus parachute pitched like a big tent. Meanwhile, teams conduct environmental classes at village schools and train Homestays members as nature guides, available for hire. Homestays families pool 10 percent of their profits for community projects that conserve cultural values, such as renovating a monastery, or improve habitat for wildlife.

In case you're wondering what happened to the marauding cat that was stuck inside the tall building in the village of Ang, the news that brought villagers crowding in for a peek also reached the ears of a local Homestay's nature guide. By insisting that they let authorities relocate the animal, the young man saved a snow leopard from being beaten to death. "That is the kind of story that keeps you going," says Rinchen Wangchuck, who helped conceive Homestays.

Snow leopard numbers for Hemis National Park and other strongholds in Ladakh look stable or even on an upward trend. Blue sheep are definitely increasing, and urial sheep have made a strong comeback from lows caused by poaching. Regional wildlife departments,
Stanzin Pulti’s yaks (left) are his wealth, and in Ladakh’s Zanskar Valley, herds are vulnerable to snow leopard attacks. Conservation groups help herders build protective corrals in return for their pledge not to kill snow leopards. Such aid gives locals economic incentives to preserve the predators—good news for the region’s ecosystem overall, but mixed news for grey like blue sheep (above).

nonprofit groups, and the mountain villages can all claim the credit together.

Success stories like these are rare in other parts of snow leopard range, where the cats continue to vanish from many locales like snow patches under a summer sun. Sprawling China hosts the greatest share—perhaps 2,000, mostly spread across the wrinkled immensity of Tibet. Yet authorities worry that the cats are being heavily hunted in China, the world’s largest market for illegal tiger and leopard products. To undermine the Dalai Lama’s influence, officials have even forced some Tibetans to wear snow leopard fur. Due to recent heavy poaching in Kyrgyzstan, the next-largest population of the predators may now belong to Mongolia, which probably holds 800 to 1,700.

Mongolia remains almost as much a nation of herdsmen as it was during the era of Genghis Khan. Livestock outnumbers the 2.6 million humans fifteen to one. Though an admirable network of parks and reserves has been established in western Mongolia, the infrastructure to manage them is thin.

“We don’t have enough staff to protect their core wildlands from heavy livestock grazing, poaching, forest fires, and illegal woodcutting,” explained Mantai Khavarkhan, the superintendent of four reserves in Mongolia’s Altay region. Yet the cat Khavarkhan called “the most secret of animals” appears to be holding its own where conservation efforts have won local support.

One winter Dashdavaa Khulaa, a park ranger in the Turgan Range, watched a herd of 27 ibex take shelter in a cliff-face cave. A mother snow leopard with two partly grown cubs followed them in. Only 24 ibex made it out. For Khulaa, the tale is part of a larger story: Though the Turgan Range, part of the Altay Mountains, saw some heavy wildlife poaching in the past, it has become a stronghold for ibex and their predators. One of the reasons is a grassroots antipoaching patrol in the Altay region known as the Snow Leopard Brigade. Ganbold Bataar, former director of Mongolia’s national park system here in the province of Uvs, is its founder and current chief.

“With two employees for this whole province, we couldn’t hope to keep up,” Bataar said. “But we have more than 200 volunteers here.”

SNOW LEOPARDS
In fields below the cliffside monastery of Phuktal, Indian farmers harvest barley one stalk at a time. As more people try to eke out a living on higher ground in the Himalayas, they increasingly cross paths with snow leopards traveling down the watershed during winter in pursuit of food, and in domesticated herds.
were local herders, and their eyes were every-where in the countryside. Whoever tuned in a poacher stood to gain 15 percent of the fine as a reward. But that wasn’t always the main incentive. Toward evening, three horsemen driving their flocks home galloped over to visit our camp. They all considered themselves vol-unteer members of the antipoaching brigade. They knew the mother snow leopard well. Shēd had three new cubs the previous year, they said. The two from her earlier litter had gone off to establish territories of their own on the mountain slopes just across the river. One had appeared prowling the iron-red ledge there just recently. One of the horsemen said simply: “I’m proud to live in a place with snowleopards.”

A small, soft-spoken woman named Bayar- jargal Agvaantseren has found another way to enlist local communities in conservation. Twice every year, this former schoolteacher sets out from the Mongolian capital, Ulaanbaatar, to visit some of the 24 herder communities she has engaged in a handicrafts project tagged Snow Leopard Enterprises (SLE), a program of the Snow Leopard Trust.

Most herder families used to sell the soft underfur of goats—cashmere—to middlemen, earning about $600 a year. Thanks to Agvaant- seren, women in the community now also make an array of products using wool from their goats, sheep, yak’s, and camel’s skins of soft yarn, felt and decorative rugs, seat pads, children’s booties, or Christmas tree ornaments shaped like snow leopards and ibex. My favorites were doll mice with whiskers of stiff yak tail hair—toys for little cats, designed to save big ones.

Through Agvaantseren, the organization buys these items from herding families and arranges to market them abroad. Participants must first sign a pledge to preserve snow leopards and their prey and to encourage neighbors to do the same. The arrangement boosts incomes by 10 to 15 percent, which elevates the status of the women and translates into more emphasis on education and health care. If no one in the com-munity kills protected species over the course of a year, the program members receive a 20 percent bonus.

In one of Agvaantseren’s communities, a win- ter village of herders in far northwestern Mongo-lia, a lively scene of trade took place on the floor of a ger heated by a stove filled with yak dung.

Long, muscular hind legs enable snow leopards to leap seven times their own body length, but such prowess hasn’t kept them out of harm’s way. The cats will flourish, say conservationists, only when they become more valuable alive than dead. Tangible paybacks give local people a chance to embrace their deepest spiritual values—and their respect for life—without risking their own survival.

A Khazakh woman named Saulekhan Kekei had brought 17 felt rugs made over 68 days. She had six children and an ill husband to sup-port. Those rugs would bring the equivalent of nearly three months’ wages in her job as a jani-tor and guard at the village school. “I own only 12 sheep,” Saulekhan said, “I have to buy wood from neighbors, But I am able to provide for everyone at home now, and pay for my eldest daughter to go to college."

An independent review in 2006 found no poaching of snow leopards in areas where SLE operates. Agvaantseren just added eight more communities and intends to expand a micro-credit scheme that lets members borrow at a discount to buy items such as spinning wheels.
The tail is so thick and mobile it looks as if the cat is being followed by a fuzzy python.

or material to improve corrals. “People hear good reports from neighbors, and they come to us now asking how to join,” she said.

In our imagination, snow leopards belong to a realm beyond the dust and noise of human affairs. In reality, only about a fifth of their range lies within reserves, and many of these contain villages and livestock. Informal protected zones exist around many Buddhist monasteries, but the Western model of establishing nature sanctuaries in landscapes unoccupied by humans simply doesn’t fit much of Asia.

Projects like the Homestays program in India and the handicrafts business in Mongolia, however, seem to fit very well. Though they cover only a small fraction of the species’ homeland so far, they make live leopards more valuable to more people each year, and in doing so they mark a path toward the conservation of high mountain ecosystems.

I never minded not seeing snow leopards—not as long as I found plenty of their sign. It was my guarantee that I would soon come across other spectacular wildlife. And it meant that I could still dream of pulling myself up to the spine of a ridge, as Sughu once did, and meeting face-to-face with a snow-cloud-colored cat climbing from the other side. ☐

What’s it like chasing snow leopards in some of Asia’s wildest mountains? Watch a behind-the-scenes video about photographer Steve Winter at ngm.com.