

Tracking snow leopard and blue sheep, WWF conservationist Eric Wikramanayake goes on a wildlife survey in Bhutan

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"It is about this high," he said, holding his hand, fingers outstretched, about two and half feet above the ground, "and is ashy-coloured, with black rings." The description fits that of the mystical snow leopard that lives in the high altitudes of the Himalaya. This traveller and his companion were from Lunana, a remote village in northern Bhutan, almost on the border with Tibet. And we were on a biological survey of Jigme Dorji National Park, Bhutan's largest protected area, conducted jointly by the World Wildlife Fund and the Royal Government's Nature Conservation Section.

Nestled on 18,147 square miles of steep, rugged mountainous terrain on the southern slopes of the Himalayan range to the east of Mount Everest, Bhutan is a small country with about 600,000 people. Although only about 120 miles from south to north as the crow flies, the elevation changes by over 23,000 feet within that short distance.

The 1,400 square mile Jigme Dorji National Park is Bhutan's largest national park, and is located along Bhutan's northwestern border. The park includes the sacred Jhumolhari mountain which, at 23,996 feet, is Bhutan's second highest. Jigme Dorji includes a range of habitat types, from warm broadleaf forests along the lower elevation southern boundary to evergreen forests of pines, fir and hemlocks, and alpine scrub and meadows carpeted with brightly coloured wild flowers in the higher elevations. The alpine habitats are a spectacular tapestry of blue, purple, yellow, pink, red flowers of primulas, poppies, gentians, impatiens, anemones, and several small rhododendrons during the spring and summer. Occasionally one sees the tall, bright-yellow flower stalk of *Rheum nobile*, the noble rhubarb, that stands above all the low herbs and shrubs like a beacon visible from across the valleys.

Above 16,500 feet the vegetation more or less disappears and the landscape becomes bare rock, boulders, and permanent snow and ice, and glaciers-thick sheets of ice that slowly pour down along the high valleys.

The park's fauna is eclectic, consisting of a mix of species that are usually associated with the tropics (the Oriental Biogeographic Region) and with northern temperate regions (the Palearctic Biogeographic Region). For instance, the snow leopard stalks the northern regions of the park while tigers and common leopards roam the broadleaf forests in the lower elevations. Recent surveys have confirmed the presence of tigers at over 9,000 feet, much higher than they were thought to occur. Herds of rare blue sheep frequent the alpine meadows, and small marmots peer above the grass, not venturing far from their colonial burrows, ever vigilant for Lammergeier and Himalayan griffon that soar high among the peaks searching for prey. The alpine meadows also harbour the two known populations of takin, Bhutan's national animal. The subalpine conifer forests harbour musk deer, endangered deer much prized for its musk glands and the red panda, a cousin of the much larger giant panda that is found in China.

The Royal Government of Bhutan has taken extraordinary steps to make sure that the rich faunal and floral diversity will be conserved into the future. The Bhutanese government has pledged to approach economic development with caution and has placed a high priority on nature and natural resource conservation- the King has declared that Gross National Happiness is more important than Gross National Product. Thus, about 10 years ago, the country's protected areas were entirely revamped to include the range of habitats and ecosystems represented within Bhutan. Whereas the previous protected areas system included large areas of biologically impoverished rock and ice habitat in the high altitude belt, the redefined protected areas system includes significant amounts of the temperate broadleaf forests and subtropical forests that harbour most of the species endemic to the Himalayas.

In a more recent revision, all the protected areas were linked by natural habitat, thus allowing species-from birds to tigers-to disperse across the landscape. Our survey in Jigme Dorji was but a small part of the long-term partnership between WWF and the government to implement conservation activities in several of these newly-declared parks in Bhutan.

We began our trek at six o'clock in the morning from a small town called Tashigang, at about 5,500 feet. We were anxious to get an early start since our destination that day was Ramena village, about five hours away and about 4,500 feet higher. The trail would eventually take us to within a day away from the village of Lunana. On the way, we would cross two mountain passes; Tse Tscho La at 13,000 feet and Gonju La at 16,500 feet.

The trail from Tashigang led across a suspension bridge strung high over the Mo Chu River and started climbing steeply immediately. Oaks, maples, beech and rhododendrons dominated the broadleaf forest around us. Monal pheasants with chicks in tow broke cover ahead of us. Shrikes, with black heads and rufous undersides hunted from branches, making forays after lizards and other small animals. By

lunchtime, we reached Shari, a small hamlet, and had lunch in a house with an impressive swarm of resident flies that promptly began invading our food and tea.

Soon after lunch, relieved to leave the flies behind, we set off for Ramena, picking wild strawberries and blackberries along the trail and keeping an eye out for Himalayan black bears that also love these berries. I had seen many people who bore scars from these chance encounters and didn't care for a personal experience. The trail soon entered a lovely grove of old moist temperate forest with large oaks and maples festooned with moss, and an understory of bamboo. This was good habitat for red panda, and we were hoping we would be lucky. Unfortunately we did not get a glimpse of this cute, rust-coloured animal which is losing ground throughout its range across the Himalaya because of habitat loss.

We reached Ramena at about four o'clock in the afternoon. The small village was surrounded by forests of rhododendrons with tall fir trees in the higher peaks. During the last hour or so of the climb there had been a persistent drizzle that became light rain just before we reached Ramena. It had been a long, tiring day, and we looked forward to an early dinner and rest. Tomorrow would be even longer. But two hours later there was still no sign of our porters who were bringing most of our baggage. About half an hour later, a couple of the porters came in. Apparently they had a late start from Shari after lunch, and one of them had decided to get drunk on rice wine. Fortunately our sleeping bags and backpacks-wet from the rain-had arrived with the two porters who came before. But our food was still in Shari. It was obvious that we would have to delay our start the next day because we would have to send someone back to Shari and hurry the others up.

We left Ramena at ten o'clock in the morning the next day, after having waited for the errant porters to arrive. The morning was misty with occasional drizzles, but the sun seemed to make an effort to come out. We were soon above 12,000 feet and the forest at this elevation was mostly fir with colourful rhododendrons in the understory. The trail followed a tributary stream to the Mo Chu River for sometime. So the vegetation along the trailside was moist and rich with various ferns and begonias. Dippers, small black and white birds that actually walk underwater on the stream-bottom to hunt for aquatic insects, foraged in the streams. White-capped water redstarts, another small rufous and black bird with a white cap that frequents streamsides bobbed about on the boulders and logs in the stream.

Around noon we stopped by the small stream for lunch. The porters gathered a few damp rhododendron twigs and made a small, rather apologetic fire. Lunch was instant noodles and suja- yak-butter tea. Definitely an acquired taste, butter tea is an important source of energy for the people living throughout most of the high altitudes of the Himalayas. The tea is brewed by churning dried leaves of a type of mistletoe, named *Viscum*, and flowers of the *Hypericum* plant in hot water with a dash of baking soda. Then a very liberal pat of green, rancid yak butter is added to the mixture. Butter tea is best drunk when piping hot, before the butter begins to solidify.

By early afternoon it began to rain again and we were now wet and cold despite the ponchos, which were ineffective against the driving wind. Finally, at about four o'clock we came to our campsite, which was a shallow cave set into the cliff face by the river. A subterranean stream emerged nearby, a natural spring of fresh, icy mineral water. The porters made a fire in the cave and started cooking dinner while we set up our tents.

The forest around us was still mostly fir and rhododendron. Here, the rhododendrons were at the tail-end of the bloom, but there still were enough flowers to brighten the forest with colour. Bhutan has over forty species of rhododendrons, from tall trees to creeping shrubs barely six inches high. During the flowering season the forest is resplendent with their blossoms that range from shades of reds, pinks, purple, orange, white, and yellow. The next day we started off at about eight o'clock in the morning after a breakfast of potato curry and red rice-half cooked at this altitude-and suja. The sun was out and there was no trace of the previous day's rain clouds. The air was crisp and clear at this altitude. The trail meandered up, around large boulders and rocks, and along the stream. Sambar tracks were evident along the trail, although by now we were probably close to the northern limit of the distribution of this large deer, which ranges throughout most of the lowlands of Asia. We kept climbing following the river for most of the way and soon left the forest zone to enter the alpine scrub zone, characterized by shrubby rhododendron species. We were now at about 13,500 feet. Fire-tailed sunbirds, bright red with yellow undersides and long, sweeping orange-red tails perched on the rhododendron bushes. The colours of these birds perfectly complemented the rhododendron flowers, which were in bloom at this altitude.

By now the climb was getting to be more difficult and required more effort, especially in the thin air. We had to divide attention to scanning the hillsides for wildlife and ensuring a firm footing on the

boulder-strewn path. It would be a very long way to any medical assistance from here, a thought that was always at the back of my mind.

We soon came to a plateau with a lake below us. The far slope of the lake was craggy and forbidding with 'boulder slides' and patches of snow. Further on, the trail traversed a 'wetland'. Although our shoes were already full of water we tried to avoid walking in the water, carefully jumping from stone to strategic stone to avoid stepping in cold water. It takes energy to warm up cold water-energy much needed to keep warm and climb!

By mid-morning it started getting cloudy and we were overtaken by wave after wave of mist, drizzle and rain. By about 11.30 we came to another, shallower lake, which was one source of the water along the trail, and waited for the porters to catch up with us. As we crossed the streamlet leading out of the lake, I found large tadpoles in this stream. This was unexpected, because we were above 13,000 feet and this was an isolated alpine lake. How do frogs make it up here?

By this time the vegetation had given way to alpine meadow with only a few scattered rhododendron bushes and large, lichen-covered boulders. The spring flowers were not out in force yet to give the meadow its riot of colour, but the blue poppies-Bhutan's national flower-and anemones were in bloom. The porters suggested having lunch here and we concurred. A hot cup of instant noodle soup augmented with boiled eggs that, judging by the smell and texture were very near the end of their 'shelf-life', never tasted so good.

We could now see the prayer flags that marked the top of Tse Tscho La pass fluttering in the distance. In the Himalaya the mountain passes are traditionally marked with prayer flags that offer a continuous prayer as they flutter in the wind. Another monument is the stone chorten, which are built for a variety of religious reasons. Usually on mountain passes they ward off evil spirits from these thresholds. Each traveller adds a stone to the chorten.

After about two hours of rest, we set off again, walking slowly to get warmed-up. Dung pellets from blue sheep indicated their presence and we scanned the hillsides for a glimpse. Not seeing any, we collected some pellets as evidence of their presence and moved on. Slowly, we climbed up to the pass and reached it with considerable relief. The sun shone faintly and briefly as if to acknowledge our effort.

The valley on the other side was a breathtaking sight. Large moss and lichen covered boulders lay scattered throughout the valley amidst rhododendron bushes with their flowers of various shades of pink, purple, and red.

The north facing slopes of the mountains towering above the valley, but unexposed to the intermittent sunlight were foreboding, with craggy rock faces, boulders and 'boulder slides' in a matrix of snow. But the more gentle south-facing slopes were covered with grassy meadows and rhododendron scrub. We rested at the top, taking in the view and then began our descent from 14,500 feet to 12,800 feet. With every step down I was acutely aware that the next day we would have to climb back up to cross Gonju La-at 16,500 feet.

A little after three o'clock in the afternoon we finally came to Thamkur, a tiny grassy plain in the valley. But since it was still rather early in the day, we decided to proceed on to a small yak-herder camp called Ragajung.

It was a gentle climb. At first. But as the trail wound around a mountain, it soon began to climb more steeply, and by five o'clock there was still no sign of Ragajung! By this time it was raining quite heavily, and had become rather cold. We were walking along the riverbank strewn with large boulders. Several landslides indicated the consequences of the heavy rains, and to confirm my trepidation, a boulder gave way and rolled down the bank in front of me.

By this time we were exhausted. We could not camp here because there was no firewood and no shelter from the wind and rain. About half-hour later two porters came by and said that the others were a little way behind. After the porters caught up with us, we kept going and about 45 minutes or so later, finally reached Ragajung. It was nestled in a valley, at 13,500 feet above sea level. It was now close to seven o'clock in the evening, and we had been trekking for over twelve hours. We collapsed around the fire in a yak-herder's tent and gratefully accepted the butter tea and hot yak milk that was offered. The juniper branches and other aromatic herbs in the fire produced a sweet aroma in the tent, closing out the rain and drizzle outside.

There were four tents in the village. These black tents, made of woven yak hair, are remarkably water repellent, yet the loose weave allows the air to circulate and the smoke to escape. Most of the herders in the village were women, including several girls aged from about ten to sixteen. The men had moved to the larger villages lower down to look for seasonal jobs.

The next morning we continued on our way along the valley. There were signs of blue sheep everywhere, including an area where the grasses had been flattened; likely a bed where a herd had rested the night before. The trail climbed gently at first crossing and re-crossing the braided river but soon began to get much steeper.

At about 15,500 feet, the vegetation gave way to a desolate landscape of bare rock, cobble, and boulders. The only vegetation was mosses and lichens clinging to rocks and small cushion plants sheltering between rocks and growing out of cracks in the boulders. We had lunch near a small alpine lake, at 15,700 feet-instant noodle soup and biscuits. Again. Needless to say, the remaining eggs that had been carried carefully to this point had to be discarded.

Taking time off to rest, I sat and enjoyed the landscape, which was mostly a canvas of grays, whites, and blacks-gray skies, gray and black mountains, and white snowdrifts and glaciers. At this altitude the area exuded power and ruggedness, rather than the delicate beauty of the tapestry of flowers in the meadows immediately below. But too soon we had to continue along the trail that kept climbing. The spectacular scenery with tall spires of mountaintops, pristine snowdrifts, and vast glaciers of flowing ice, however, provided some fulfillment. The next pass, Gonju La, at 16,500 feet was a glacier that we took time and care to cross-a misstep on this 50 foot slab of ice would have meant a long climb back up from the valley far below.

On the other side of the pass, the trail had more or less disappeared with a large landslide, and was now a treacherous matrix of loose soil, cobbles and boulders. But after a while it became more apparent again, and kept winding down and heading northeast until, at about 15,500 feet, we again came upon alpine meadow. By this time there were more fresh blue sheep tracks. They may have been scared away by the porters who were now ahead of us. But it was heartening to see evidence of abundant blue sheep. The presence of these prey species would also mean good populations of snow leopards.

We were heading for Cheriphu, our campsite, which turned out to be an overhanging rock-ledge shelter by the side of the trail. When we got there a traveller and his little daughter from the village of Lunana was already there. He has seen three takin by the river, about 150 feet away but in a deep ravine. By this time it was close upon 6 o'clock in the evening and we were tired. Nevertheless we went down to check on this rare animal, but after some futile searching decided that the animals had left.

The next day we walked further along the trail towards Lunana, dropping down to about 13,300 feet and into the treeline. The trail led into a broad, shallow valley, and then up into the next range of hills, across from Lunana village and the Tibetan border. The forest consisted of junipers, fir, and blue pine. We spent the day-a sunny one for a change-ground-truthing and checking the vegetation maps that had been recently prepared using satellite images, and headed back to camp. On the way we collected droppings from a mid-sized carnivore, probably a fox or similar-sized animal, which had been using the trail quite frequently.

Early next morning we started back, heading up to the pass. We came across the herd of blue sheep we had missed two days before, grazing high up on a peak. It was a small herd with four adult females, but judging by the hoof prints we had seen there had to be more and larger herds around.

We camped at Ragajung for the night again, and continued on the next day. In the rhododendron forest we came across Blood pheasant and Monal pheasants with chicks.

That day we decided to make it all the way back to Ramena village. It should have been easier coming downhill, but it started raining and it was late in the evening when we got to Ramena. Sangay immediately dispatched a porter with instructions to find some meat for dinner as a change from the staple of instant noodles. We had a substantial dinner, relatively speaking, by candlelight in a vacant house and I collapsed into a deep sleep.

Early next morning we sat around on the thick pinewood floor of the house, eating a breakfast of rice and the last of our canned fish. I was impatient to get going- the lure of a hot shower in Thimphu-and was the first to finish.

While waiting for the others to finish, and mentally hurrying them on, I was subconsciously watching several maggots about the size of the rice grains crawling on the floor.

The 'breakfast table' had obviously not been cleaned in a while and I assumed that the ubiquitous flies had laid eggs between the floorboards.

But then I noticed that there was a rather steady 'rain' of maggots descending on the floor, on us, and on the food from above. Looking up, I saw strips of yak meat hung out to dry on a line directly above us and the meat was crawling with maggots. Sangay noticed me looking at the meat, and with a beam on his face proudly announced, "the meat for last night's dinner".

