

In the first week of October 2018, as the southwest monsoon retreated from south Karnataka, the Bandipur Tiger Reserve, located 80 km south of Mysuru, was a sight to behold. Nature lovers flocked to take in its endless vistas of hillocks draped in a canopy of green.

The Bandipur Tiger Reserve is flanked by the Wayanad Wildlife Sanctuary in Kerala and the Mudumalai Tiger Reserve in Tamil Nadu. It is home to nearly 570 tigers, according to the ‘Status of Tigers in India, 2014’ report by the National Tiger Conservation Authority. These tigers share the forest with elephants, dholes, leopards and other mammals, making the tiger reserve an ecological hotspot.

But this idyll began to change by the end of December. When the northeast monsoon failed, it set alarm bells ringing in the Forest Department. Ambadi Madhav, then Field Director of the Bandipur Tiger Reserve, began to worry. “The forest looks luxurious, but it could become an inferno this summer. The abundance of leaf litter and dry shrubs provides an ideal condition for wild-fire,” he said in January. His staff raced against time to clear the dry vegetation through controlled burning in different parts of the forest along what is known as the fire line. A standard practice in all national parks and wildlife sanctuaries across the country, this reduces the amount of combustible material in the forest and minimises the intensity of the fire in case of an outbreak.

By mid-December, the deciduous forests of Bandipur filled with dry Lantana camara – an invasive weed that covers almost 50% of the 912.04 sq km reserve – had become a powder keg. It was a similar scenario in Wayanad and Mudumalai too. In both these reserve forests, fewer fire incidents in the last two years had led to an accumulation of combustible material. “The rise in temperature coupled with the dearth of summer rains had turned the entire forest area into a tinderbox,” says N.T. Sajan, Warden at the Wayanad Wildlife Sanctuary.

D. Rajkumar of the Wildlife Conservation Foundation, Mysuru, says erratic weather was a major factor. Apart from rainfall in November/December, dew and mist during winter serve as an insulation against an early outbreak of fire, he says. “The temperature at Gopalswamy Betta (GS Betta) in Bandipur can dip to 12°C in winter. But there were barely 15-20 days that witnessed such temperatures this winter, as against the average of 40 days. This added to the moisture stress,” says Rajkumar.

Contrary to popular perception, most forest fires in India are man-made. They are either acts of negligence or stoked deliberately, says M.S. Ravikumar, Assistant Conservator of Forests, Bandipur subdivision. “Three persons arrested in this case subsequently confessed that they started the fire. They wanted to burn the habitat in the hope that wild animals, especially elephants, would move away in search of fodder and not venture near their villages.”

How the fire spread

The first major fire was reported around noon on February 21, at Bandipur’s Kundukere range. It was brought under control within hours. But there were sporadic incidents of fire on the night of February 22 as well at Melukamanahalli, after which NGOs and volunteers were roped in to assist the field staff. The severity of the fire incidents increased on February 23. Thanks to windy weather, the conflagration raged on for two days. The forest authorities then asked for Indian Air Force choppers, which were pressed into service on February 25. With help from the choppers, the wildfire was finally contained on February 26.

Soumya, a field staff stationed at the Melukamanahalli forest post, recalls the wildfire with a shudder. “A huge wall of fire blazed through the dry vegetation. Withering bamboo stumps exploded and shot up in the air, spreading the flame further. By the time we managed to contain the fire in one patch of the forest, it had spread to other parts.” By February 24, the leaping flames had spread from Melukamanahalli to the GS Betta range, reducing a vast swathe of the forest to ashes. GS Betta, which draws hundreds of tourists during weekends, is prefixed with the moniker ‘Himavad’, an allusion to the cloud and mist that envelops the landscape. But it was fire and smoke that greeted the firefighters and volunteers who approached it in the last week of February.

For Shailendra Kumar, Range Forest Officer of the Maddur forest range in Bandipur, wildfires are not a new challenge. “I have battled them almost every year since I joined the Forest Department nearly 15 years ago. But what unfolded in GS Betta was intense, made worse by the thick carpet of dry leaves and foliage,” he says.

It was on February 21 evening that Kumar first received information about a fire in the GS Betta range, and since it was a minor break out, it was doused within an hour. But even before the fire-fighting team could wind up their operations, they received an SOS to assist in dousing a massive fire in the Kundukere range, approximately 18 km from GS Betta. This fire gained in intensity before the team could reach there.

“Additional staff from the adjoining Bandipur range were deployed. Six teams were constituted. They fanned out. Working through the night, they



“With large swathes of the Bandipur forests still dry, the risk of wildfires will continue to haunt the authorities until the southwest monsoon sets in again.” Forest fires rage in the Bandipur Tiger Reserve in February. PTI/ M.A. SRIRAM

# When Bandipur burned

The forest fire that erupted in Bandipur Tiger Reserve last month devastated hundreds of acres of pristine forest. **R. Krishna Kumar** and **E.M. Manoj** report on the mammoth effort that went into containing the fire and the need to upgrade fire-fighting capabilities



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N.T. SAJAN  
Warden at the Wayanad Wildlife Sanctuary

managed to contain it by dawn,” says Ravikumar.

Little did they know that this was only the beginning of a long-drawn battle. On February 22, there were fresh fires adjoining GS Betta. The authorities realised that this was an emergency as a fire atop a hill can travel in no time and hit the valley below. The Maddur range borders GS Betta and the inferno could devastate the core forest of the tiger reserve, if not stopped.

The field staff, equipped with sprinklers and jeeps strapped with water containers, began their patrol around Kardikal Betta (which is 3 km from GS Betta) and the road bordering the Maddur range. If the fire crossed the dividing road, then Maddur, and with it the core of Bandipur, could go up in flames. Wayanad, which borders Moolehole, would also be in danger and was therefore put on alert. Though the authorities at the Wayanad Wildlife Sanctuary appear to have avoided a catastrophe for now, given the drought-like situation in the region, the looming threat of wildfire remains.

But in Bandipur it was only getting worse. On February 23, as the team continued its battle against the fire, smoke billowing from the far horizon brought to light signs of fresh fires. So this was not just an isolated wildfire raging on the forest fringes but multiple fires wreaking destruction across the landscape. Clearly, the available manpower was inadequate to contain it. So volunteers and conservation activists were sounded out for assistance. Quickly, about 400-500 of them responded, and were deployed in different ranges to

help the firefighters.

As the fire threatened to spread to Mudumalai, a similar number of people, including NGOs, joined hands with officials in the Mudumalai Tiger Reserve to contain the fire. They worked round the clock, according to A. Pushpakaran, Deputy Director (Buffer Zone), Mudumalai Tiger Reserve.

Help from tribals

For the volunteers in Bandipur, the hillocks proved to be a challenge. The steep cliffs and the air heavy with smoke made breathing difficult. Even masks weren’t much of a help. The volunteers could get no closer than 100 metres from the fire, recalls Rajkumar, a wildlife warden in Bandipur. But they wouldn’t give up. Volunteers Nathanie Hill and Arun Kumar are avid travellers who are also interested in drone photography. “Bandipur is a place we worship. When we learned about the fire and the need for volunteers, we decided to put our hobby of flying drones to good use,” says Hill.

“The volunteers brought their own set of skills, which bolstered our fire-fighting capabilities. With a drone, we had an eye in the sky to detect smoke in a radius of 3 km,” says B.P. Ravi, Additional Principal Chief Conservator of Forests, who was among the senior officials coordinating the operations.

However, the first line of defence against forest fires are the tribals, drawn mainly from the Jenu Kuruba, Soliga, and Betta Kuruba tribes. About 400 of them were deployed as fire-watchers, and if not for them, the damage would have been far greater, say officials, underlining the importance of involving local communities in forest conservation initiatives.

Windy weather made the task of containing the flames almost impossible. But as the wind velocity subsided a little, volunteers closed in to clear the shrubs. With the help of the tribals, they created a bald patch of land to starve off the approaching wall of fire. “The nor-

mal wind speed in the region is around 5 km per hour. But during the wildfire, it was around 15 km per hour, and that was the root cause of the inferno,” says C. Jayaram, who retired recently as the Principal Chief Conservator of Forests (Wildlife).

On February 25, the fire team noticed more plumes of smoke drifting across the landscape, threatening to engulf the forests to the west of GS Betta, up to Maddur and Moolehole.

By then it had become a do-or-die situation. If Maddur and Moolehole were affected, the wildfire could spread to Wayanad as well. It was then that the assistance of IAF choppers was sought. Two MI-17 helicopters were pressed into service the same day at 2.30 p.m. Between them, they did about 10 sorties on February 25, pouring out nearly 30,000 litres of water, which helped a great deal in containing the fire. The firefighting staff on the ground gained the upper hand for the first time. This signalled a turning point in the fight. “The aerial operations continued on February 26, but were withdrawn after two more sorties as we had managed to contain the fire by then,” recalls Ravi.

Despite the manpower and resources deployed, Ravi felt something was missing. He decided to seek assistance of a different kind. He turned to Ameya Gode, Director, Silvanus Earth Observation, Pune, known for his expertise in the analysis of satellite imagery. “Based on satellite data, he tracked the direction of the fire all through the night. He informed us of potential new fire spots based on the wind direction and the nature of the vegetation in those areas. This helped us prepare adequately. We identified the beats where the fire spots were located and organised our forces accordingly,” says Ravi.

Damage assessment

Satellite images have brought out the extent of the damage caused by the inferno. The National Remote Sensing Centre, Hyderabad, recently released a

report based on Sentinel-2 satellite data, which revealed that in Bandipur alone, 15,443.27 acres were damaged by the fire between February 23 and 25. Wildlife Scientist M. D. Madhusudan of the Nature Conservation Foundation estimates that 17,000 acres (or 70 sq km of forest) were affected as the National Remote Sensing Centre did not consider damage in revenue land, which is administratively part of Bandipur. In Wayanad, the fire ravaged nearly 295 acres of forest wealth, while in Mudumalai, officials pegged the fire-damaged forest area at 123 acres. There are no estimates yet of the number of casualties in the fire. Wildlife officials say that while bigger mammals like tigers and leopards may have fled the Bandipur Tiger Reserve and taken refuge in neighbouring areas, reptiles, which are slow-moving, would have borne the brunt.

Given the fact that wildfires have been a part of the forest ecosystem, a section of scientists and conservationists say that forest fires are not all that bad since they help regenerate the vegetation. Besides, there is a perception among officials that small and controlled fires may be necessary to reduce the piling up dry leaf, dead and decaying wood, and lantana. If that is not done, the next fire could be even bigger, they warn.

These views have sparked a new debate, with conservationists cautioning that frequent and uncontrolled fires could be a disaster for the habitat. A joint report of the Ministry of Environment, Forest and Climate Change and the World Bank, titled ‘Strengthening Forest Fire Management in India’, released in 2018 observes that “repeated fires in short succession are reducing species richness and harming natural regeneration.”

Wildlife biologist Sanjay Gubbi points out that Bandipur and the adjoining forests have a history of recurring fires. “Uncontrolled forest fires over vast areas not only destroy habitats and food sources of wildlife but also kill smaller mammals, ground-nesting birds (such as pipits, lapwings, nightjars, quails), insects, and reptiles. The valuable leaf litter accumulated on the forest floor, which acts as natural manure for trees and plants, is also destroyed,” he says.

Studies conducted by the Kerala Forest Research Institute in the fire-affected forests of Wayanad and the grasslands of Parambikulam and Eravikulam validate these concerns. They show that the forest soil receives temporary nutrient enrichment from the burning but reverts to a lower nutrient content than before within a short span.

Moreover, forest areas frequently affected by fire show an erosion of soil, floral and faunal diversity. They are also more vulnerable to the spread of alien invasive plants, says S. Sandeep, Scientist, Department of Soil Science, Sus-

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Wildlife biologist

tainable Forest Management Division, Kerala Forest Research Institute.

In the case of Bandipur, there is a clear danger of homogenisation of the habitat, with fire-resistant species such as *Anogeissus latifolia* and *Cassia fistula* taking over the landscape, says Gubbi.

A wake-up call

At the moment, forest officials in Kerala are most concerned by the prospect of a large-scale exodus of wild animals from Bandipur to Wayanad, especially elephants and gaurs, says B.N. Anjan Kumar, Chief Conservator of Forest (Wildlife), Palakkad.

Though migration is common during the months of February and March, forest fires accentuate the process, says Gubbi. Fire engulfs and burns the natural food sources of herbivores such as elephants, spotted deer, and gaur, preparing the ground for mass migration. Lack of adequate natural fodder in the forests could escalate human-animal conflict. Elephants could end up venturing into agricultural fields to devour standing crops, he adds.

While everyone takes stock of the damage, they all agree that this year’s Bandipur fire is a wake-up call that underscores the need for a fresh look at our fire-fighting mechanisms. Currently, these are primarily based on clearing vegetation along fire lines during the winter. But what is needed is a template for coordination with outside agencies, including NGOs and scientists.

“A standard operating procedure will be drafted to ensure that, in the future, the department is better prepared in terms of men, materials, and coordination,” says Ravi, adding that a fire drill should be held every January, apart from regular interaction with local villagers and tribes on the subject of fire control.

“Preventing large-scale fires is more vital,” says Gubbi. “It is better than scurrying around after they break out. Timely and proactive preparation with local involvement much before the fire season starts is crucial.”

Meanwhile, unseasonal rains have brought some welcome relief after the fire. But the daytime temperatures are still hovering around 36 degrees. With large swathes of the Bandipur forests still dry, the risk of wildfires will continue to haunt the authorities until the southwest monsoon sets in again. And that’s still a good three months away.

With inputs from Aravind Kumar B.