

# Mentorship Trip Report: On the Plateaus of Kasargod

As part of the RHATC course (2025–26), we went for an eight-day mentorship programme in Kerala. The theme of our mentorship was “Ecological restoration of the lateritic plateaus of Kasargod, Kerala”. During this period, we visited several lateritic plateau sites across Kasargod District. We were hosted by Shyamkumar Puravankara, an architect, local conservationist, and member of the Kasargod District Biodiversity Management Committee. He is interested in traditional and sustainable architecture and is an avid birder as well. Since he’s committed towards conservation of northern Kerala’s lateritic plateaus, he generously took us to various sites around the landscape to help us understand its unique ecology.

The first sight of a lateritic plateau left us amazed. As we visited during winter, the grasses were dry, resulting in vast golden stretches that seemed to glow in the sunlight. These plateaus are locally known as ‘para’. They are formed through extensive weathering caused by rainfall, temperature variations, and wind. Rich in iron and aluminium, the soil of plateaus has a distinct reddish-brown colour. They are misclassified as wastelands; however, the hidden beauty of these plateaus is extraordinary. They form a mosaic of grasslands, forest patches, and water pools, with a multitude of small microhabitats like crevices, boulders, exposed rock, and seasonal wetlands. Each of these habitats supports a different world of life. To truly see the hidden richness of these plateaus, one needs patience, time, and complete attention to how it changes with the seasons, from seeming barren in summer to becoming flushed with life in the monsoon. The microhabitats support ephemeral

plant species, amphibians, birds, mammals, invertebrates, and reptiles, and many endemic species are found only on these plateaus, as harsh extremes of temperature and precipitation require specialized adaptations to survive.

One of the most fascinating aspects of lateritic plateaus is how plants grow on such hard, rocky surfaces. The answer lies in biological soil crusts, commonly known as biocrusts, the true heroes of these ecosystems. Biocrusts are thin layers composed of algae, lichens, fungi, cyanobacteria, and bryophytes. They appear as a blackish-brown layer on the rock surface and are very easy to overlook. When we first saw them, we assumed it was simply black rock. Later, we realized that this thin layer was biocrust which is something small yet incredibly important, as they trap soil and moisture, carrying out nutrient cycling, and allow plants to root in them. Without them, the survival of plants in these arid and nutrient-poor conditions would be extremely difficult. Through this mentorship, we began to understand that what appears lifeless at first glance is actually a fragile and highly specialised ecosystem, quietly supporting an incredible diversity of life.

## Day one – 17 Dec 2025

We reached the first location, Ariyittupara, bright and early at around 6:45 AM. It was a lovely, peaceful landscape that mostly consisted of grassland on the laterite, with patches of forest in depressions and crevices. We took a long walk through the golden grassland as mist evaporated in the sunlight, photographing birds, and recording the common plants we



**Biocrust supporting *Polycarpia corymbosa* on exposed rock. © Sanjana VK.**

be installing panels on completely flat areas, as the rocky slopes (though gentle) are difficult to work on. It was bittersweet to learn that such a beautiful landscape would soon be devastated, as solar panels raise the ambient temperature significantly and don't allow anything to grow nearby.

After breakfast, we visited Kayyurpara, where we saw a permanent pool on a laterite plateau grassland, with some stunted trees growing along the bank. A Little Egret was using the area to forage, and Shyam told us it was a good area to see raptors. There were also some groves here, though much fewer, and one grove had a house built inside it, with two cows grazing nearby. We asked about human use of the plateaus and learned that people rarely use the plateaus apart from occasionally cutting tall grass for roof thatching, allowing their cattle to graze during the monsoon (though most people tend to feed them at their homes), and using pools for washing. Installing boundary

knew. In the groves, we saw several invasives like *L. camara*, *C. odorata*, *A. auriculiformis*, and *Casuarina*, some of which Shyam told us had been planted by the forest department. We also saw a lot of bird diversity, such as the vernal hanging parrots which came to feed on the *Casuarina*, as well as porcupine and potentially jungle cat scat on the red soil trail we were following. Shyam told us that the area had been earmarked for a large solar farm project, but some of the groves would remain protected because they were sacred groves (called 'kaavu'). They would also only



**Entering Kayyurpara. © Sanjana VK.**



**Solar farm at Vellooda. © Pathak Hrishikesh.**



**The laterite road leading into Ariyittupara, Ariyittupara at sunrise, making field notes. © Sanjana VK.**

walls around ponds also reduces the ebb and flow of water, preventing the water level from changing naturally. Nearby, there were coconut plantations that had been set up on private land on the plateau.

One side of the grassland held a laterite mine, where bricks of laterite stone had been cut out to use for building. We learned that laterite bricks are the cheapest locally available building material, that each mine yields a few thousand bricks and can be used to build around five houses, and that miners do not quarry below 6 m as the stone becomes too brittle to use for building. After a glimpse of a Booted Eagle, we visited another pool nearby, where we saw several more raptors (Crested Serpent Eagles, a Brahminy Kite that flew down to drink water, and a rare Montagu's harrier). At the pool, we saw signs of human use like discarded soap, but it also supported a variety of beautiful water plants and ephemeral vegetation that grew on the banks.

After a break for lunch, we left again in the evening to visit Koyithattupara, where we saw several more abandoned mines. It was disconcerting to see these red scars left on the landscape on one side of the road while

grassland and forest stood intact on the other. Here, power lines also criss-crossed the grassland-forest mosaic landscape, and we saw more litter (plastic water bottles and alcohol bottles) than we had seen before. We learned that mines are always dug on private land but may sometimes be illegal, and that the quarry owner has an obligation to ensure that the leftover debris is replaced in the mine, but this doesn't happen. We also saw invasive species of grass growing on the debris piles that had been abandoned. The forest patches had many *Syzygium caryophyllata* trees, which had short but broad canopies. The species is a characteristic of lateritic landscapes and classified as 'Vulnerable'.

This site also had a dry wetland that supported *Nymphoides krishnakesara*, a 'Critically Endangered' endemic species of the lateritic plateaus that was described only nine years ago, making it a potential site to establish a Biodiversity Heritage Site. We saw a few cattle grazing in that area, which could be a potential threat. Lastly, we visited Karindalam, where we saw 17 Little Ringed Plovers crossing a large dry wetland, and once more saw the grassland-forest mosaic laid over the gently rolling plateau. Here some construction was ongoing



**The Koyithattupara landscape; a mine site at Koyithattupara; Abandoned debris at a Koyithattupara mine; Invasives growing on a debris pile; Cattle grazing at Koyithattupara. © Sanjana VK.**



**Seven Little Ringed Plovers at a dry wetland. © Sanjana VK.**

for a college building, as well as for some new electricity towers, and litter was present. We waited till dark to catch a glimpse of a few Jerdon's Nightjars before heading home for the day, tired but happy to have seen how beautiful the plateaus appear during sunrise as well as sunset.

### Day two – 18 Dec 2025

We set out early in the morning to visit a perennial stream in Periya, which hosted the endemic *Crinum malabaricum*. We were joined by Dr Biju Punnakot, an assistant professor at the Government College Kasaragod. As a botanist who has described several new species from these lateritic plateaus, his expertise was invaluable. His deep knowledge of the local flora turned our walk into an intensive learning session.

We followed a narrow path between coconut plantations until we reached the stream. The water level was low, and the metre-long, ribbon-like leaves of *Crinum malabaricum* lay across the stream bed, looking as if they were paused in time, preserving the direction of the water flow. Standing there, Dr Biju described the



**Measuring the length of *Crinum malabaricum* leaves. © Sanjana VK.**



Ananthapuram hillside with the bauxite mining plant; *Lepidagathis ananthapuramensis*. © Sanjana VK.

plant's ecology, while simultaneously pointing out several other species in the close proximity. As we walked back along the road, it became a challenge to keep pace with him as he identified almost every species in sight. We hurriedly clicked photos and took detailed notes, creating a record of his identifications to aid our future reports.

Next, we moved towards Periya para, a natural lateritic plateau featuring a pool often used by locals for daily activities. En route, Shyam suddenly stopped the car, having spotted a bird. Although we were initially unsure of the ID, we later confirmed it to be a Blyth's Pipit, a rare species to sight. We parked and began our walk toward the site. Along the way, we passed through a grassland and Dr Biju guided us through the grass taxonomy, pointing out the *Lepidagathis keralensis* which was prevalent in this area. We took a moment for a photo session amidst the grassland before reaching the pond. Here, the water body supported a rich diversity of aquatic flora and Dr Biju identified various species of *Eriocaulon*, *Blyxa*, and *Nymphoides indica*. We stopped by the water body for a while before heading to a Kudumbashree-run hotel for a cheap and delicious breakfast.

During the drive to the next site, we asked Dr Biju how one goes about identifying grasses. He recommended different field guides, and our conversation deepened as he discussed the region's orchid diversity, mentioning genera like *Habenaria*, *Dendrobium*, *Bulbophyllum*, and *Oberonia*. He also

spoke of the ephemeral, post-monsoon carnivorous plants that appear on the plateaus, including *Drosera* species and more than 20 species of *Utricularia* (bladderworts). It was astonishing to learn that around 650 species of angiosperms exist in the laterites of Kasaragod.

We then reached Ananthapuram, the only known location for *Lepidagathis ananthapuramensis*, a point endemic species with an area of occurrence of less than 5 km<sup>2</sup>. Tragically, it is threatened by bauxite mining in the area. Dr Biju showed us how this species differs from the common *Lepidagathis keralensis*, while the latter is a thorny creeper that hugs the laterite, the point endemic *L. ananthapuramensis* grows vertically. We also observed an interesting micro-climatic feature: the laterite rock here felt noticeably cooler compared to other areas we had visited. Directly opposite this site stood the Ananthapuram Temple, famous for the legend of a "vegetarian" crocodile. We took a walk through the temple premises and were fortunate enough to spot the mugger crocodile resting in the shade behind the temple. The temple itself is surrounded by a lateritic pool, which serves as a home for this reptile.



*Strobilanthes integrifolia* in bloom.  
 © Sanjana VK.

After a refreshing break for coconut water, which was much needed after the heat of the field, we visited the biodiversity park of the Government College Kasaragod. The park appeared to be in ruins, with an atmosphere suggesting no one had stepped inside for a long time. However, there was a surprise for us. As soon as we entered, Dr. Biju was amazed to see *Strobilanthes integrifolia* (a kurinji species) in bloom. Since this species blooms only once every seven years, it was a joyous moment for him. Dr. Biju walked us through the park, pointing out the *Strychnos nux-vomica* from which Kasaragod is said to derive its name. We also observed a fallen *Acacia*; its shallow root system had failed to penetrate the hard laterite, causing it to topple, which is a clear lesson in why non-native species often struggle here.

He then led us to the bamboo botanical garden, which is also a 'Pachaturuth'. This term refers to a Kerala government initiative aimed at increasing green cover by creating mini-forests on waste or fallow lands. Fortunately, this site was not in good condition; it was dried up and appeared to have lacked watering for a long time. The bamboo here had been sourced from the Uravu Bamboo Nursery, one of the largest in southern India. While walking back, we spotted a rodent that had made its home inside a bamboo clump. We tried to photograph it, but it fled its grass nest. Before leaving, Biju discussed other *Strobilanthes* species found in the area, such as *S. jomii*, *S. integrifolia*, and *S. ciliata*. We then proceeded to have lunch near the college and bid farewell to Dr. Biju, and thanked him for his time and insights in the field.

Following lunch, Shyam took us to the Kasaragod Saree Co-operative Sale Centre. These sarees are a geographical indication (GI) tagged product, and it was wonderful to witness the making process of these traditional textiles.

We ended our day at Bekal Fort. Inside, we saw a landscape that had been "beautified" by clearing the native vegetation to create clean lawns. Shyam explained that the fort used to host many native grass species, but since the beautification efforts, they have all been cut down and replaced with conventional lawn species, allowing invasive species to take over. We watched a White-bellied Sea Eagle soaring above us and enjoyed the cool sea breeze. We ended the day sharing some pickled pineapple, enjoying a beautiful sunset.

### Day three – 19 Dec 2025

We began the day by travelling to Azhithala, where Shyam wanted to take us for beach combing (surveying for birds along the shoreline). It was a refreshing change of



**Beach combing at Azhithala. © Sanjana VK.**

landscape, and we spotted various waterbirds along the way, including Eurasian Curlews, Whimbrels, a White-bellied Sea Eagle, and Black-bellied Terns. We also saw a number of martins, which Shyam told us are quite rare in this area. It was a challenge to capture photos of these fast-flying birds, and we were highly unsuccessful in doing so. Towards the end of our walk, we reached the river mouth, which had been modified into a boat channel for fishing, resulting in ongoing erosion of the shore. After a long walk across the beach, we took a bus back to the parking area. On the way, we stopped for breakfast, where we enjoyed several local breakfast dishes and snacks.

Shyam then took us to his family home to meet his mother and sister. It was a beautiful sight, as the house featured the same sustainable architectural style and use of local materials as his home, where we were staying. After a brief introduction, Shyam showed us pictures of birds he had taken when he had just started birding. We then left for Vellooda. Shyam had told us that this area had been converted into a solar farm and that there were also laterite brick mines nearby. As we walked towards the site, we passed through a grassland which, like the others we had seen, held many native shrub patches in the depressions. We came across a nearly dried-up water body and were observing the landscape when suddenly, a woolly-necked stork flew in and stood right in front of us. It was an amazing sight to see such a large bird up close.



**Woolly necked stork at Vellooda. © Sanjana VK.**

However, the view of the solar farm was disheartening. It was painful to see how the landscape had been destroyed in the search for renewable energy. While discussing this with Shyam, we learned that these solar farms raise the ambient temperature by more than 5 degrees compared to the average, which

prevents biodiversity from coming up in the area. On the other side of the plateau, we saw a degraded mining site where the debris piles were filled with invasive grasses, similar to Koyithattupara. We took note of the location coordinates and left the area, ending our day with another reminder of the threats these plateaus face.

## Day four – 20 Dec 2025

On the fourth day of our field visit in Kasargod, we visited a nearby wetland to observe birds. The wetland was a water-filled paddy field that supported a rich diversity of bird life. We observed several species such as the Lesser Whistling Duck, Fulvous Whistling Duck, Pheasant-tailed and Bronze-winged Jacana, Grey Heron, Grey-headed Swamp Hen, Northern Pintail, Gadwall, and White-breasted Waterhen. This visit highlighted the importance of wetlands and paddy fields as crucial habitats for waterbirds.

After this, we visited SEEK (Society for Environmental Education in Kerala), an NGO dedicated to nature education and conservation that has been established for around 40 years in Kasargod. SEEK actively conducts workshops and eco-club activities to create environmental awareness and to provide hands-on experiences with nature, especially for students and local communities.

The centre has a spacious campus that can accommodate around 100 people at a time. The area surrounding the building is rich in diverse plant species, creating a vibrant habitat for many butterflies and birds. As we walked around the campus, we were amazed by the large number and variety of butterflies, fluttering everywhere, making the place feel alive. We also observed several bird species, adding to the serenity and ecological richness of the site. A stream flows

close to the campus, supporting a wide range of aquatic and semi-aquatic life. We observed crabs, fishes, snails, slugs, dragonflies, and damselflies in and around the stream. There was also a small dam constructed above the stream.

To reach the dam, we climbed along the stream, moving over large boulders and uneven, rocky surfaces. What began as a simple observation soon turned into an adventurous stream-climbing experience. The entire experience was thrilling, refreshing, and truly memorable, leaving us with a sense of gratitude and admiration for such well-protected natural spaces.

After lunch, we visited the Bheemanadi Reserve Forest. This was the only protected area we visited during the trip, and as it was closer to the Western Ghats rather than the coast, we noticed that the forest patches were larger and more contiguous, sometimes entirely enclosing grassland patches, rather than the other way around as we had seen before. We walked 3–4 km from the start of the forest to the end and returned the same way. At the end of the forest, there were agricultural plantations and we also saw rubber plantations.

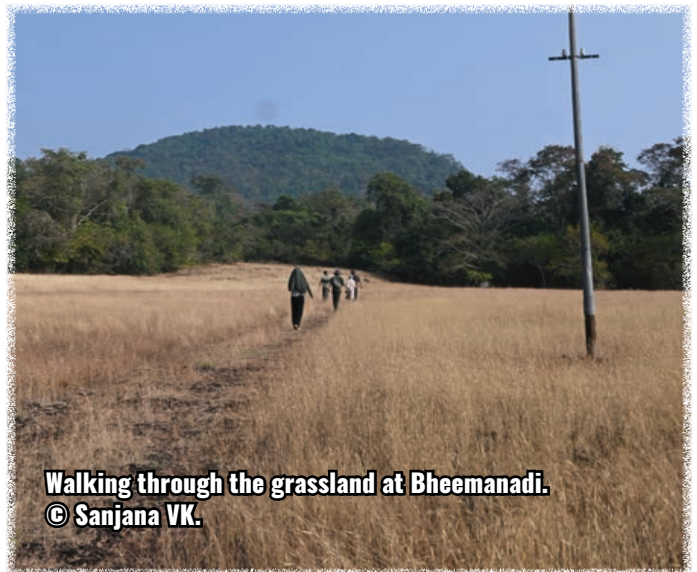
The walk through the forest was a good experience. Inside the forest, we saw a small shrine and a permanent water pool. We saw grey wagtails, bulbuls, a black-naped monarch, and chestnut headed- bee-eaters bathing in the water, as well as a lone green sandpiper. It was interesting to watch how the birds dipped their beaks and fluttered their feathers in the water, then flew back to nearby branches. We also observed some invasive plants growing in the water. Near the bank, we saw *Eriocaulon* species, and there were trees surrounding the pool which provided shelter and habitat for birds. While walking in the grassland we also



The paddy wetland. © Sanjana VK.



The stream at SEEK. © Pathak Hrishikesh.



Walking through the grassland at Bheemanadi.  
© Sanjana VK.



*Memcydon* sp. © Shreya Yadav.

observed a beautiful katydid. On the dry grass it looked like a leaf. We also noticed human intervention in the forest, local people use forest paths to collect wood. Mud roads constructed by the forest department were also being used by local people. Such activities were identified as potential threats to the forest ecosystem and its resources.

## The rest of the trip

The first five days of our mentorship were spent visiting different lateritic landscapes of Kasargod. From these site visits, we gathered information from field observations and interactions with local people. We documented plants, different grass species, and many bird species, and also observed several lateritic mining pits. After the site visits, we stayed at our place and started reading literature. Through this, we tried to connect what we observed in the field and understand it in relation to the published studies, as well as design a preliminary restoration plan addressing the threats we had seen. While reading, we learned more about lateritic plateaus. Some papers on the flora of northern Kerala were particularly helpful in improving our understanding.

We had questions regarding mining sites, such as how quarry owners select sites and what criteria they use. With Shyam's help, we interacted with a quarry owner. This interaction helped clear our doubts, such as how miners select sites to quarry, and also helped us understand the quarry owner's perspective.

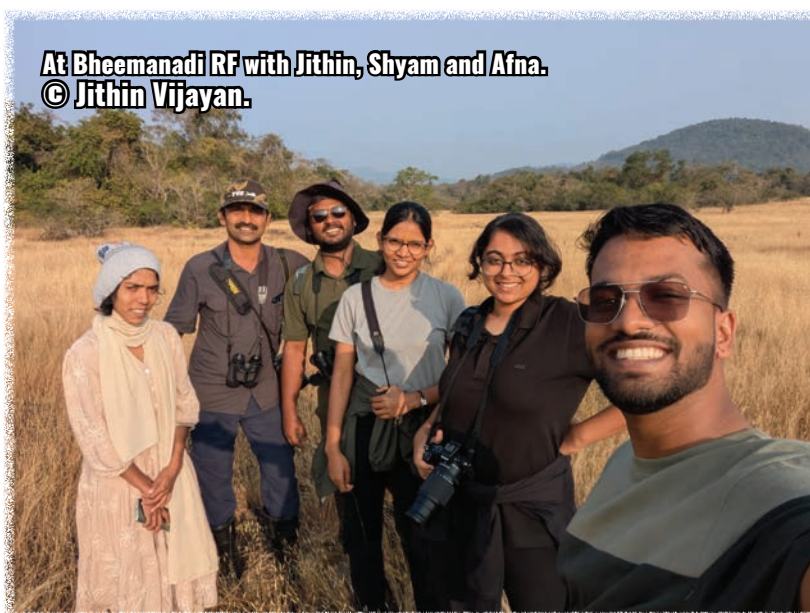
Jithin Vijayan (CEROS Lab, Nature Conservation Foundation) travelled to Kasargod to share his knowledge on rocky outcrops. He also accompanied us once more to Bheemanadi, with his researcher friend Afna, and explained lateritic plateaus and their diverse flora and fauna. He showed us the biocrust layer, which we had earlier mistaken for black rock. His knowledge helped us understand lateritic plateaus better. He and Afna also spoke to local people about their perceptions of lateritic plateaus and shared insights from their responses. He further guided us on how to structure questions for perception studies.

Jithin also arranged a Zoom call with Dr. Aparna Watve, who works on rocky outcrops and plateaus in Maharashtra. She spoke about lateritic plateaus and their hidden flora and fauna. We also discussed our restoration

plan for the lateritic plateau with her. Her inputs helped us think more clearly and logically about restoring the landscape. Interacting with and learning from all these people helped refine our understanding and gave us a clearer perspective on lateritic plateaus.

## Sitewise comparison

Below, we include two tables detailing the different sites we visited and the ecosystems and threats we observed at each.



At Bheemanadi RF with Jithin, Shyam and Afna.  
 © Jithin Vijayan.

| Site number | Location       | Conservation notes                                   | Vegetation type                         |
|-------------|----------------|------------------------------------------------------|-----------------------------------------|
| 1           | Ariyittupara   | 3 grass species described from here                  | Grassland, forest groves                |
| 2a          | Kayyurpara     |                                                      | Grassland, pool                         |
| 2b          | Kayyurpara     |                                                      | Grassland, pool                         |
| 3           | Koyithattapara | Rare endemic - <i>Nymphoides krishnakesara</i>       | Grassland, forest groves, dry wetland   |
| 4           | Karindalam     |                                                      | Grassland, forest groves, dry wetland   |
| 5           | Periya stream  | Rare endemic - <i>Crinum malabaricum</i>             | Running stream                          |
| 6           | Periyapara     |                                                      | Grassland, pool                         |
| 7           | Ananthapuram   | Rare endemic - <i>Lepidagathis ananthapuramensis</i> | Grassland                               |
| 8           | Vellooda       |                                                      | Grassland, forest groves, dry wetland   |
| 9           | Bheemanadi     |                                                      | Grassland patches, forest patches, pool |

| Site number | Location       | Solar farm | Laterite mining | Bauxite mining | Plastic littering | Livestock grazing | Natural resource use | Plantations | Power lines | Invasives |
|-------------|----------------|------------|-----------------|----------------|-------------------|-------------------|----------------------|-------------|-------------|-----------|
| 1           | Ariyittupara   | ✓          |                 |                | ✓                 |                   | ✓                    |             |             | ✓         |
| 2a          | Kayyurpara     |            | ✓               |                | ✓                 | ✓                 | ✓                    | ✓           |             | ✓         |
| 2b          | Kayyurpara     |            |                 |                | ✓                 |                   | ✓                    | ✓           |             | ✓         |
| 3           | Koyithattapara |            | ✓               |                | ✓                 | ✓                 | ✓                    | ✓           | ✓           | ✓         |
| 4           | Karindalam     |            |                 |                | ✓                 |                   | ✓                    |             | ✓           | ✓         |
| 5           | Periya stream  |            |                 |                |                   |                   |                      |             |             |           |
| 6           | Periyapara     |            |                 |                | ✓                 | ✓                 | ✓                    | ✓           |             | ✓         |
| 7           | Ananthapuram   |            |                 | ✓              |                   |                   |                      |             |             | ✓         |
| 8           | Vellooda       | ✓          | ✓               |                | ✓                 |                   | ✓                    |             |             | ✓         |
| 9           | Bheemanadi     |            |                 |                | ✓                 | ✓                 | ✓                    |             |             | ✓         |

## Learning outcomes

Through this mentorship, our understanding of the laterite plateaus saw a shift from seeing it as barren rock to recognizing it as a complex mosaic of ecosystems. We learned to identify the hidden life that sustains this ecosystem, from the microscopic biocrusts that support plant growth to the rare point-endemics found only in specific seasonal pools. Our field visits, guided

by experts, taught us to observe the landscape's resilience against extreme heat and rain, and highlighted the importance of surrounding habitats in supporting diverse bird and insect life.

We also gained an understanding of the specific threats facing these landscapes, observing how laterite mining and solar farms permanently alter

Exploring the forest. © Sanjana VK.



*Lepidagathis ananthapuramensis*.  
© Sanjana VK.



*Nymphoides indica* at Kayyurpara.  
© Sanjana VK.



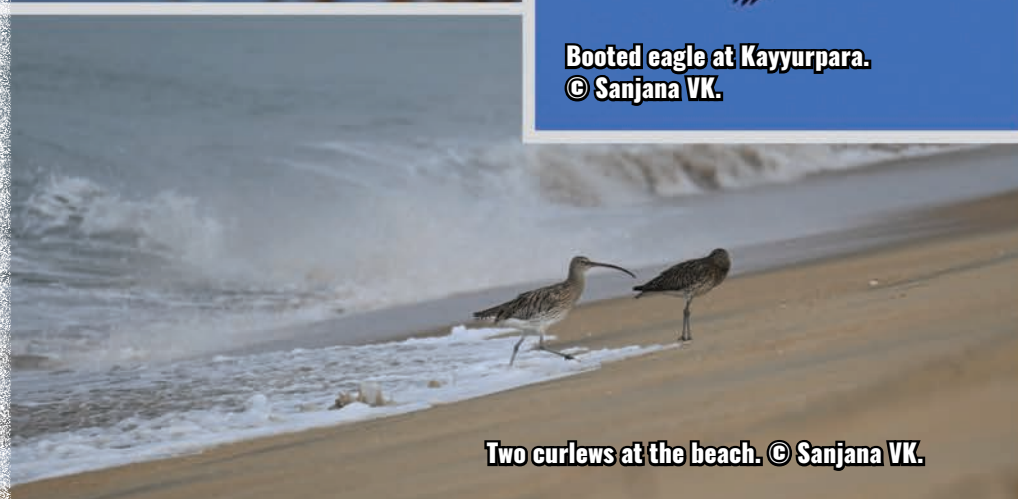
A mine site at Koyithattupara. © Sanjana VK.



Booted eagle at Kayyurpara.  
© Sanjana VK.



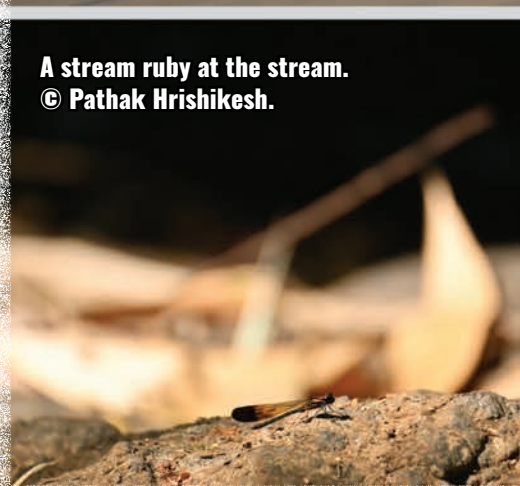
Two curlews at the beach. © Sanjana VK.



Invasives growing on a debris pile.  
© Sanjana VK.



A stream ruby at the stream.  
© Pathak Hrishikesh.



The egret at Kayyurpara.  
© Sanjana VK.



the terrain and raise local temperatures. We realized that actions, like beautification at the fort can lead to the loss of native biodiversity to invasive species. However, our learning went beyond just observation. Through literature reviews, interactions with quarry owners, and perception studies guided by experts, we understood that conservation is deeply tied to people. This experience helped us to bridge the gap between scientific theory and the reality on the ground, helping us think logically about future ecological restoration. Overall, we had a wonderful visit and were very fortunate to have the chance to glimpse these beautiful landscapes of northern Kerala.

## Acknowledgements

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Ariyittupara at sunrise. © Sanjana VK.