

Satellite Telemetry of Jacobin cuckoo using SARAL ALTIKA under IBIN Project

(A joint collaborative initiative between IIRS and WII)

About *Jacobin Cuckoo*

According to Indian myth, Jacobin cuckoo (*Clamator jacobinus*) is also known as “*Chatak*”, heralds the onset of monsoon in India and arrives during summer to breed from southern Africa by flying over the Arabian Sea and the Indian Ocean. The Pied Cuckoo, Jacobin Cuckoo, or the Pied Crested Cuckoo belongs to cuckoo order of small terrestrial birds with long-wing, soft plumage, and a fancy crest on the head, quenches its thirst with raindrops. The cuckoo is also unique in that it is a brood parasite and instead of making its own nest, it lays its egg in the nest of other birds, particularly Jungle Babbler. This bird with arboreal nature mostly sit on tall trees but often forages for food in low bushes, and occasionally on the ground. It prefers well-wooded areas, forests and bushes in semi-arid regions.

Tracking Technology

Tracking the long-distance migration routes and stop-over sites of Jacobin cuckoo from the Himalayan foothills to all the way down to and from Africa is a technological challenge given the cuckoo’s low body weight. However, adult cuckoos weigh between 65 to 75 grams, thus, any tracking device to be tagged need to be very small or as per the thumb rule, it has to be less than 3% of the bird’s body weight. Considering tracking requirements, one such solar powered Platform Transmitter Terminal (PTT) weighing just 2 grams that have been supplied by Microwave Telemetry Inc. USA. With permission from the Uttarakhand State Forest Department, two Jacobin Cuckoo were caught carefully in the agricultural fields near the WII campus in Dehradun few days ago and deployed with 2g tags. This bird tagging helps to track their movements which is picked up by the Argos satellites when they pass overhead. The ground based satellite system calculates the position of PTT and the bird carrying it, and then transmits data to software for visualization of its movement patterns and stoppage sites. This tracking technology continues transmitting information until device fails or bird dies, allowing us to obtain unbiased data about what happens to each tagged bird.

Vision and Mission of Satellite Telemetry under IBIN Project

The satellite telemetry of Jacobin Cuckoo is a part of Indian Bioresource Network (IBIN) project of Indian Institute of Remote Sensing (ISRO) in collaboration with Wildlife Institute of India. The IBIN project is funded by the Department of Biotechnology (DBT), which aims

to deliver relevant information on bioresources (i.e. plants, animals and other biological organisms) of India through a web geoportal. The overall project is executed at IIRS with the help of various data partner's institutes. Following are sub-objectives w.r.t to satellite telemetry of Cuckoo:

- Online web-based geospatial dashboard will be developed for near-real-time monitoring of trends and patterns in movement of Pied Cuckoo or Jacobin Cuckoo, satisfying the IBIN objective, i.e., **development of location analytical tool.**
- The near-real-time location of Jacobin Cuckoo will be used in **species niche modelling web-application of IBIN portal**, which is developed using maximum entropy approach of machine learning. This application enable users to develop relationship between species occurrence with respect to environmental conditions. Such approach will help in understanding the suitability of bird in different climatic and temporal variations, as one of the objective of IBIN project.
- The IBIN project consists of various biodiversity and environmental parameters which will help in assessing the likely impacts of projected climate change on the potential distribution of Jacobin Cuckoo in the altered climate change scenarios.
- According to one of the IBIN objective on increasing use cases by potential users, **the web services will be developed for this bird and then, distribute them through API in an interoperable manner.** The API will hold its location information as well as some more parameters such as taxonomy, synonyms, etc.