

ABSTRACT

DISTRIBUTIONAL PREDICTIONS AND THE IMPLICATION OF HABITAT LOSS TO THE CONSERVATION OF THE CALAYAN RAIL *Gallirallus calayanensis*

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Though rare at this time and age, the discovery of the Calayan Rail *Gallirallus calayanensis*, is proof that there is still much to learn and discover about biodiversity before they are lost. The Calayan Rail, locally known as “piding” was introduced to science only in 2004 and is endemic to the forests of the small island of Calayan. Currently, it is classified as Vulnerable owing to its small range and population size, or it may be classified as Critically Endangered should there be evidence of population decline. The foregoing warrants a deeper look into the distribution of this species in its natural habitat, especially in the face of possible threats to its existence including deforestation, habitat fragmentation and exploitation. Thus this study generally aimed to look into the influence of environmental factors on the distribution of the Calayan Rail *Gallirallus calayanensis* in a small island ecosystem in the Philippines. Moreover, it analyzed threats to the existence of Calayan Rail *Gallirallus calayanensis* and generated information for valuable inputs to research and conservation planning of biodiversity for small island systems. The suite of tools employed in this study included ecological niche modeling, Geographic Information System (GIS) and remote sensing to construct a model of the Calayan Rail’s niche and distribution. Also, analyses of threats were carried out using satellite-derived datasets to aid in conservation planning for small islands. A novel database on the Calayan Rail, which can impart valuable insights in assessing its conservation status, was built up. The distributional range of the Calayan Rail covers about 9,016.95 hectares. Plausibly, this distribution modeled reflects only the present and excludes the historical range of the species. Vegetation, precipitation and elevation are important environmental factors that characterize the habitat of this bird. The significance of vegetation in the model, supported by field observations and local anecdotes, verifies that the Calayan Rail is well-adapted to the forest of Calayan, and not only within limestone areas. Furthermore, with precipitation as one of the leading environment variables, it not only shows the Calayan Rail’s preference for wet climatic conditions, but also for a habitat with rich moisture and water reserves, which in turn meet water demands for agriculture and households in the community. Meanwhile, elevation relates to human disturbance because it signals the encroachment in the forest. The rate of forest loss is proportional to the rate of habitat loss, with at least 8 – 27% of the Calayan Rail habitat gone from 1979 to 2006. The results substantiate the perceived threat of forest loss to distribution of the Calayan Rail; and at the same time provide evidence of the severity of its impact to the distribution of the species. While habitat loss is only one of the human-induced threats to the Calayan Rail, there is a need to carefully study other major threats to this bird. The model used in the study will improve as more information from the ground and from the advances in remote sensing and GIS come to light; it is thus recommended to continue developing the model and to continue doing detailed studies on the Calayan Rail and its habitat. Future research as offshoot of this study that can be conducted to improve the model or gain more knowledge on the species include human encroachment studies, radio-telemetry and animal movement studies and projections from climate change scenarios.