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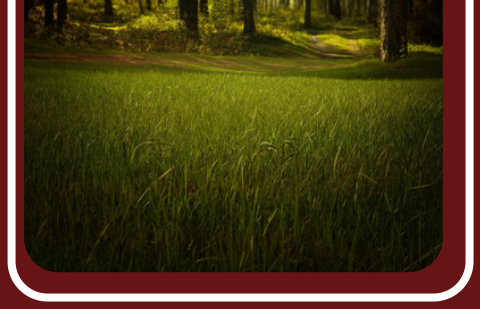
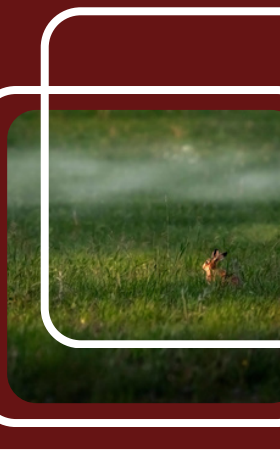
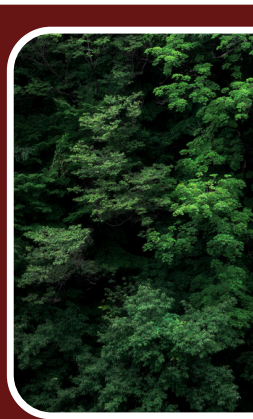
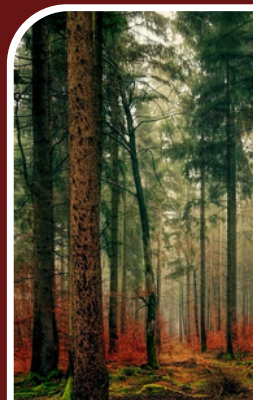
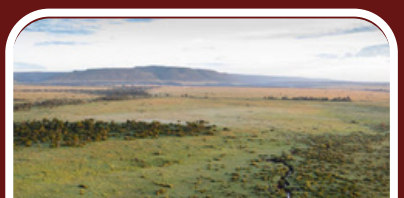
GEOSPATIAL EXCELLENCE

HABITAT SUITABILITY ASSESSMENT



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The **red panda (*Ailurus fulgens*)** is a small, arboreal mammal native to the temperate forests of the eastern Himalayas and southwestern China. Distinguished by its reddish-brown fur, long bushy tail, and masked face, the red panda plays a vital ecological role in maintaining forest health through seed dispersal and bamboo consumption. Classified as Endangered by the IUCN, the species faces significant threats from habitat loss, fragmentation, and poaching. The main **objective** of this study is to **identify, map, and analyze the potential habitats of the Red Panda within the state of Sikkim, India.**

Parameter	Description
Location	Sikkim, India
Geographical Extent	Approximately 7,096 km², situated in the Eastern Himalayas
Topography	Highly mountainous with elevation ranging from 280 m to 8,586 m
Ecological Context	A biodiversity hotspot characterized by temperate broadleaf and conifer forests, suitable for Red Panda habitation

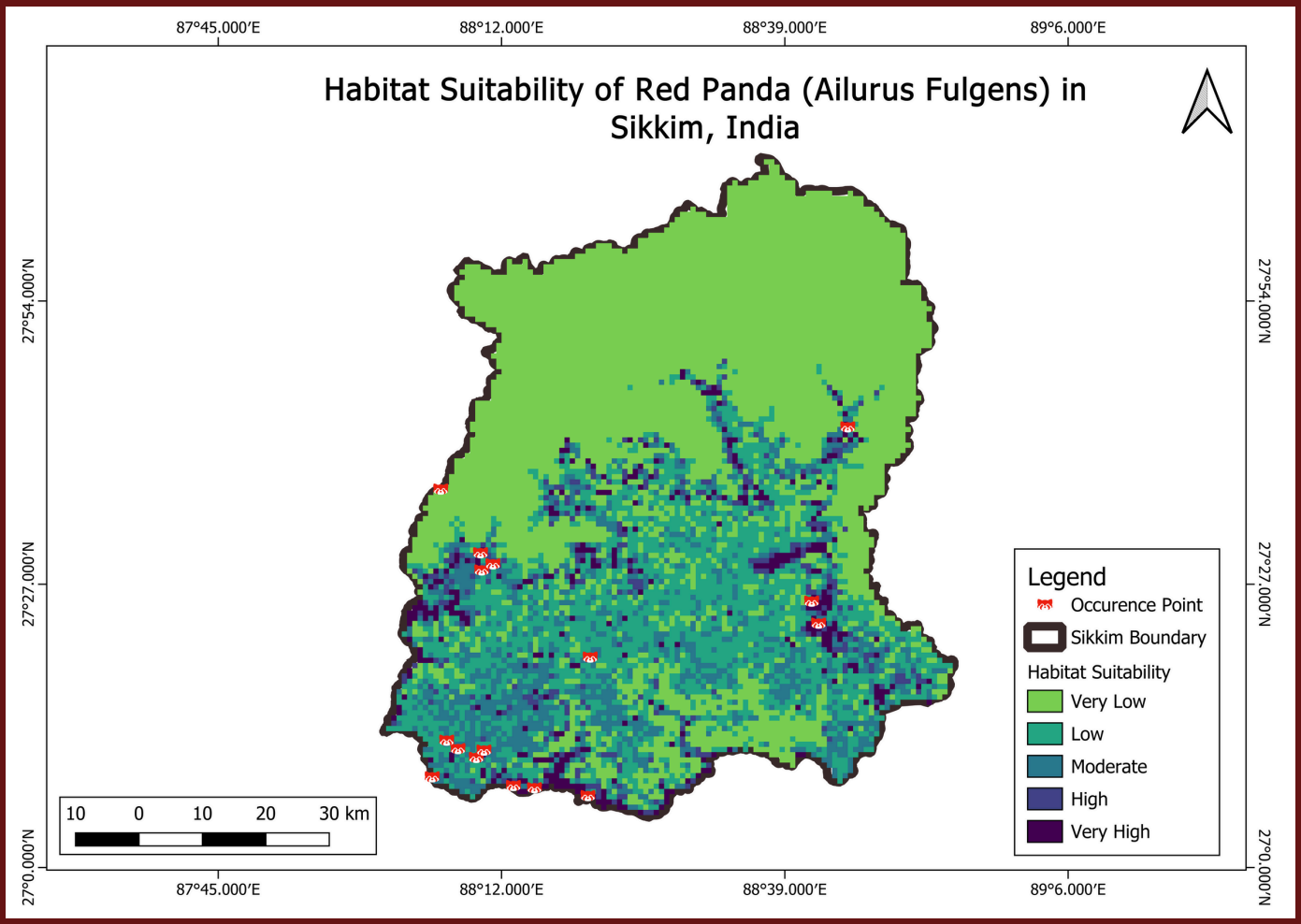

Figure 1 : Habitat Suitability of Red Pandas

- The analysis showed excellent predictive performance with an accuracy score of **95%**.
- Annual precipitation (45.3%), land use/land cover (17.6%), and maximum temperature of the warmest month (16.0%) were the most **influential factors**.
- Southern and western Sikkim, especially forested mid-**elevation areas** between 2,000–3,500 m, showed the highest habitat suitability.
- Fragmented and human-disturbed regions exhibited moderate to low suitability for Red Panda habitation.
- The findings highlight the strong influence of climatic and land-use factors on Red Panda habitat distribution.

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