

Research Article

Habitat Suitability Analysis of Javan Leopard (*Panthera pardus melas* Cuvier, 1809) in Gunung Gede Pangrango National Park (GGPNP) and Its Management Implications

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(Received: February 25, 2026; Revised: May 18, 2026; Accepted: July 05, 2026)

ABSTRACT

The Javan leopard (*Panthera pardus melas*) is an endangered apex predator that functions as an umbrella species for tropical montane rainforest ecosystems, such as in Java Island's Gunung Gede Pangrango National Park (GGPNP), Indonesia. This study aimed to assess habitat suitability, evaluate socio-economic impacts on buffer-zone communities, and formulate adaptive management strategies in Gunung Gede Pangrango National Park (GGPNP). A multi-disciplinary approach was employed, integrating Maximum Entropy (MaxEnt) modelling for spatial analysis, social surveys to examine human–wildlife interactions, and the Analytic Hierarchy Process (AHP) to prioritise management strategies. The results indicate strong model performance (AUC = 0.870). Prey availability was identified as the most influential environmental predictor (54.5%), followed by distance from roads (16.2%) and distance from rivers (5.3%). Highly suitable habitat was estimated to cover an area of 2,482.89 ha. Socio-economic findings reveal that road accessibility facilitates illegal poaching of natural prey, triggering prey-switching behaviour in leopards in the form of livestock depredation and increasing the risk of retaliatory actions by local communities. The priority strategies identified comprise three levels of intervention: macro-level measures involving regulatory synchronisation and the implementation of SMART Patrols; meso-level actions focusing on habitat restoration in key resource hotspots; and micro-level initiatives emphasising ecotourism development and community economic empowerment. This study concludes that integrating ecological protection with the enhancement of community economic capacity is essential for the sustainable conservation of the Javan leopard in GGPNP.

Key words: Javan Leopard, Habitat Suitability, Human–Wildlife Conflict, MaxEnt Modelling, Adaptive Management

