## 33. Mapping Tree-Related Microhabitats in Italian Forests through Remote Sensing and Spatial Modeling

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Tree-related microhabitats (TreMs) are field-observed indicators of forest structural complexity and habitat availability whose direct assessment remains labor-intensive and spatially discontinuous. This study evaluates a conservation application of a national 30-m map of predicted TreM abundance by examining its spatial relationship with the Italian Natura 2000 network. The map, which covered 10.33 million ha of Italian forest and had a median predicted abundance of 274 MH $ha^{-1}$, was generated by combining multisite field observations with Landsat and Sentinel-2 time-series predictors. The Natura 2000 network contained about 2.89 million ha of forest. It included 32.0% and 33.7% of the national forest area above the P90 and P95 prediction thresholds, corresponding to 748 and 971 MH $ha^{-1}$, respectively. These classes occupied 11.44% and 6.03% of mapped Natura 2000 forest, compared with 10% and 5% of the national forest domain, producing enrichment ratios of 1.14 and 1.20. At P99 (1,973 MH $ha^{-1}$), Natura 2000 contained 25.2% of the corresponding national area, and the enrichment ratio decreased to 0.90. Among the 1707 sites analyzed, site means were markedly asymmetric, with a median of 327 MH $ha^{-1}$ and a small number of sites reaching substantially higher values. These percentile classes are relative components of the national prediction distribution and should not be interpreted as ecological thresholds. Because the underlying model showed moderate within-domain performance but weak transferability to forest landscapes not present in the calibration set, the resulting summaries are intended for spatial screening and field-survey prioritization rather than site-condition certification.