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Quantitative analysis of ecological protection objectives in the Yellow River basin

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Abstract The primary driving factor for ecosystem disturbances in the Yellow River basin is the degradation of ecosystem structure and function caused by water shortage. Ecosystem health is determined by a series of thresholds, and if these thresholds are exceeded the ecosystem can only be restored to a healthy state with the greatest difficulty. Due to spatial variability and zones of different ecological importance, the Yellow River basin has been delineated into 51 zones, of which 13 were identified as preferential zones. Vegetation coverage rate and population scale were chosen as indicators and analysed with models for optimal vegetation coverage rate and water resource carrying capacity, respectively. The ecological status of most zones meets the optimal protection objectives, except Ningxia and Inner Mongolia, the Henan region in the middle reach and the delta.

Key words scarce water resources; preferential protection zones; optimal vegetation coverage rate; optimal population scale; the Yellow River basin