



## **Ecological security pattern construction based on ecological protection redlines in China**

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China is facing huge environmental problems with its current rapid rate of urbanization and industrialization, thus causing biodiversity loss, ecosystem service degradation on a major scale. Against this background, three previous examples (the nature reserve policy, the afforestation policy, and the zoning policy) are implemented in China. These all play important roles in protecting natural ecosystems, although they can sometimes cause new problems and lack rigorous targets for environmental outcomes. To overcome current management conflicts, China has proposed a new “ecological protection redlines” policy (EPR). EPR can be defined as the ecological baseline area needed to provide ecosystem services to guarantee and maintain ecological safety. This study analyzed the scope, objectives and technical methods of delineating EPR in China, and put forward the proposed scheme for the ecological security pattern based on EPR. We constructed three kinds of redlines in China, including key ecological function area redlines, ecological sensitive or fragile areas redlines, and forbidden development areas redlines. For the key ecological function area redlines, a total of 38 water conservation functional zones have been designated, covering a total area of 3.23 million km<sup>2</sup>; 14 soil conservation zones have been designated, covering a total area of 881700 km<sup>2</sup>; wind-prevention and sand-fixation zones across the country cover a total area of about 1.73 million km<sup>2</sup>, accounting for 57.13% of the total land area of the whole country. With respect to the ecologically vulnerable redlines, 18 ecologically vulnerable zones has been designated across the country, covering 2.19 million km<sup>2</sup>, accounting for 22.86% of the total land area of the whole country. Forbidden development areas redlines covered a total area of 3.29 million km<sup>2</sup>, accounting for 34.3% of the total land area of the whole country. We also suggest to form a complete ecological security pattern including patterns of protecting ecological function, residential environment safety, and biodiversity maintenance. Further emphasis should be put in supporting management and control measures in order to promote ecological protection in China.