

VIEWPOINT

Progress and challenges in freshwater conservation planning

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ABSTRACT

1. Freshwater ecosystems and their associated biota are among the most endangered in the world. This, combined with escalating human pressure on water resources, demands that urgent measures be taken to conserve freshwater ecosystems and the services they provide. Systematic conservation planning provides a strategic and scientifically defensible framework for doing this.
2. Pioneered in the terrestrial realm, there has been some scepticism associated with the applicability of systematic approaches to freshwater conservation planning. Recent studies, however, indicate that it is possible to apply overarching systematic conservation planning goals to the freshwater realm although the specific methods for achieving these will differ, particularly in relation to the strong connectivity inherent to most freshwater systems.
3. Progress has been made in establishing surrogates that depict freshwater biodiversity and ecological integrity, developing complementarity-based algorithms that incorporate directional connectivity, and designing freshwater conservation area networks that take cognizance of both connectivity and implementation practicalities.
4. Key research priorities include increased impetus on planning for non-riverine freshwater systems; evaluating the effectiveness of freshwater biodiversity surrogates; establishing scientifically defensible conservation targets; developing complementarity-based algorithms that simultaneously consider connectivity issues for both lentic and lotic water bodies; developing integrated conservation plans across freshwater, terrestrial and marine realms; incorporating uncertainty and dynamic threats into freshwater conservation planning; collection and collation of scale-appropriate primary data; and building an evidence-base to support improved implementation of freshwater conservation plans.

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