研究报告

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人工补水条件下的缺水河流生态修复综合评价方法

Comprehensive assessment on ecosystem restoration of water-deficient rivers with artificial recharge

关键词：缺水河流 人工补水 生态修复 多目标综合评价 多层次综合权重 永定河

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作 者 单位

于 森 中国科学院大学, 北京 100049

王明玉 中国科学院大学, 北京 100049

刘 佳 中国科学院大学, 北京 100049

刘培斌 北京市水利规划设计研究院, 北京 100044

赵月芬 北京市水利规划设计研究院, 北京 100044

杨 毅 北京市水利规划设计研究院, 北京 100044

摘要：构建了人工补水条件下的缺水河流生态修复多目标综合评价指标体系,对生态修复中影响评价指标量化结果的因素进行了综合考虑,提出了包含主、客观因子并反映层次关系的综合权重确定方法,进而建立了一种人工补水条件下的缺水河流生态修复综合评价方法,以更好地解决多目标决策中的总目标量化问题.最后,以正在建设的永定河生态修复工程为例,通过构建典型的生态修复情景方案,对建立的评价指标体系进行应用,确定各评价指标的综合权重系数,并对构建的情景决策方案进行了综合评估,验证本文提出的评价指标权重综合调整的必要性,说明构建的人工补水条件下的缺水河流生态修复综合评价方法的合理性与可行性.结果表明,所提出的评价方法不仅对人工补水条件下的河流生态修复决策具有一定的实用价值,而且对其它类型生态修复多目标综合决策评价也具有借鉴意义.

Abstract: A multi-objective comprehensive evaluation index system was established for the ecological restoration of the artificially recharged water-deficient rivers. The related impact factors were comprehensively examined, and two key factors were identified to quantify the index attributes and evaluation consequence. A multi-level and comprehensive weighting approach was proposed in determining the weight coefficients of the index attributes. A framework for scenario-based multi-objective comprehensive evaluation on the ecological restoration was then suggested which could better address the issue on quantification of the overall objective in the multi-objective decision-making. By taking the ecological restoration of the Yongding River as a case study, the established evaluation index system, the proposed approach, and the suggested framework were applied to demonstrate their rationality, feasibility, and practicability for ecological restoration of the artificially recharged water-deficient rivers. It was concluded that the proposed framework and approach had implications in multi-objective decision-making of the river ecological restoration under the conditions of artificial recharge and other pertinent applications.

Key words: water-deficient river artificially recharged rivers ecological restoration multi-objective comprehensive evaluation multi-level and comprehensive weighting approach Yongding River

主办单位：中国科学院生态环境研究中心

单位地址：北京市海淀区双清路18号 邮编：100085

服务热线：010-62941073 传真：010-62941073 Email：hjkxxb@rcees.ac.cn