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【文献速递】

1. 西藏草地生态安全评价研究——基于生态系统服务价值改进的生态足迹模型

作者：李中锋，高婕，钟毅

文献源：干旱区资源与环境，2022

摘要：西藏草地生态安全建设是国家生态安全屏障建设的重点内容。对西藏草地生态承载力和生态安全程度进行评价研究，对于认识草地生态安全现状、提升草地生态安全程度、巩固生态安全屏障建设具有重要意义。基于生态系统服务价值改进的生态足迹模型，测算人均草地生态盈亏指数、草地可持续利用指数、草地生态压力指数和草地生态协调系数，运用熵权模糊综合评价法对 2010-2020 年西藏全区及西藏七地市的草地生态安全状况进行评价。评价结果显示：1)西藏全区草地生态安全程度波动上升，生态安全等级一直保持在“很安全”状态。2)七地市中，那曲市和山南市草地整体生态安全程度最高，林芝市、日喀则市和阿里地区草地生态安全程度相对较高，拉萨市与昌都市草地生态安全程度相对较低。总的来说，西藏草地生态安全屏障功能良好，但同时面临草地盈余空间分布不平衡、草地生态协调度偏低、部分地市草地生态压力增大等现象，生态安全格局需进一步巩固。

2. 基于生态系统服务价值和景观生态风险的生态分区识别与优化策略——以祁连山国家公园青海片区为例

作者：乔斌，曹晓云，孙玮婕，高雅月，陈奇，于红妍，王喆，王乃昂，程弘毅，王义鹏，李甫，周秉荣

文献源：生态学报，2023

摘要：生态空间分区识别是支撑自然保护地生态资产管理的前提性和基础性工作。以祁连山国家公园青海片区(以下简称为“园区”)为例，集成遥感技术、地理信息模型方法、景观生态学方法、GIS 格网法，分析了园区 1998—2018 年土地利用、生态系统服务价值、景观生态风险的时空演变特征，选用 Z-score 标准化构建了四类生态分区。结果表明：(1)草地占园区面积的 55.00%以上，30 年间(1998—2018 年)园区土地利用之间转移总面积为 102.49 km²。(2)3 个时期(1998

年、2008年、2018年)园区生态系统服务价值(ESV)约为274亿元/a,单位面积ESV为172.94万元/km²。不同ESV等级呈现“大分散、小集聚”的镶嵌交错分布格局,高寒河源湿地区和寒温带针叶林区为ESV的高值区。(3)3个时期园区景观生态风险指数(ERI)分别为0.2287、0.2286和0.2310,生态安全状态整体较好,景观生态风险以低生态风险等级和较低生态风险等级占主导地位,占园区面积的90.00%左右。人工牧草地、旱地、建设用地的景观生态风险等级较高。(4)结合生态系统服务价值和景观生态风险两个维度将园区划分为生态保障型生境修复区(I)、生态脆弱型特别保护区(II)、生态改良型发展利用区(III)和生态预防型保育涵养区(IV)四类生态分区,并提出差异化管控方案。

3. 干旱半干旱区地表覆盖对土壤风蚀的影响

作者:麻虹宇,李保国,蔡斌,李颖,葛乐,张丹

文献源:水土保持研究,2022

摘要:为了探究地表覆盖对干旱半干旱地区土壤侵蚀及表层特性的影响,探寻农业发展的新机遇,使用Meta分析的方法,通过搜集国内外干旱半干旱地区土壤覆盖已发表的研究数据,分析了3种地表覆盖方式:覆盖植物、秸秆覆盖和高留茬对土壤风蚀模数及表层干容重、含水量和有机碳含量的影响。结果表明:(1)地表覆盖使土壤年风蚀量降低77.96%,地表风蚀量与覆盖度密切相关,秸秆覆盖度最高,减轻风蚀效果最佳。(2)地表覆盖平均降低2.94%表层(0—20 cm)土壤干容重,从而提高孔隙度保水保肥,抑制土壤侵蚀;其中覆盖植物效果最好,能够降低5.26%。(3)地表覆盖能够增加6.26%年均表层土壤含水量,从而有效增大土壤颗粒间的黏聚力;在降水量≤450 mm的半干旱地区该值能达到10.62%。(4)地表覆盖能够提高23.54%表层土壤有机碳含量,增加土壤颗粒间的黏结性,从而提高土体的抗风蚀能力;高留茬的提升效果最好,为34.42%;覆盖植物中豆科作物的效果最好,平均提高30.76%。总之,3种地表覆盖措施均能不同程度地减轻风蚀,能够实现保土、保水和固碳的多重收益,是未来双碳背景下实现农业可持续发展的有效解决方案。

4. 国土空间规划背景下畜牧业生产适宜性评价与分区——以锡林郭勒盟镶黄

旗为例

作者：荣丽华，李伊彤

文献源：干旱区地理，2022

摘要：针对现有“双评价”方法对牧区县域生产空间落位指导性较差的问题，探索畜牧业生产适宜性评价方法，实现牧区县域生产空间合理划分。以锡林郭勒盟镶黄旗为例，通过计算畜牧业生产概率偏差与畜牧业生产密度，求解研究区畜牧业生产强度，并结合牧区空间管控与地形限制等因素，运用空间自相关分析实现畜牧业生产适宜性分区。结果表明：（1）镶黄旗畜牧业生产密度远超《锡林郭勒盟草地适宜载畜量核定工作指导意见》中载畜量标准，畜牧业生产概率偏差呈网络化分布趋势，畜牧业生产强度较高区域相对集中。（2）畜牧业生产限制指数高值区主要分布于浑善达克沙地边缘、中心镇区；畜牧业生产限制指数低值区域主要分布于宝格达音高勒苏木全域、翁贡乌拉苏木南部与巴音塔拉镇的昆都仑嘎查、汗乌拉嘎查等。（3）畜牧业生产强度与畜牧业生产限制指数 Moran's I 为-0.0944，两者呈空间负相关，聚集效应显著且相似性较差。（4）镶黄旗畜牧业生产适宜性分区可分为畜牧业发展重点区、禁止畜牧业生产区、畜牧业生产转移区、退牧生态修复区、畜牧业发展高、中、低弹性区。国土空间规划背景下，科学评价牧区县域畜牧业生产适宜性，对于指导牧区“划区轮牧”具有重要现实意义，同时对于探索草原牧区地域性空间规划理论与方法具有一定理论意义。

5. Progress of Ecological Restoration Research Based on Bibliometric Analysis

作者：Xi Wei，Wei Song，Ya Shao，Xiangwen

文献源：International Journal of Environmental Research and Public Health，2022

摘要：With the deterioration of the global/regional ecological environment, ecological restoration plays an important role in sustainable development. However, due to the differences in research methods, objectives, and perspectives, the research results are highly diverse. This makes it necessary to sort the publications related to ecological restoration, clarify the research status, grasp the research hotspots, and predict the future research trends. Here, 23,755 articles from the core database of Web of Science were retrieved, and bibliometric analysis was carried out to understand the global ecological

restoration research progress from 1990 to 2022 from a macro perspective, with the aim to determine the future development direction. The results are as follows. (1) From 1990 to 2022, the number of publications in the field of ecological restoration constantly increased, and the fluctuation of the average annual citations increased. The most important articles were published in high-ranking journals. (2) Ecological restoration covers a wide range of research areas, including biodiversity, ecosystem services, climate change, land use, and ecological restoration theories and technologies. The four main hotspots in this field are heavy metal removal, soil microbial biomass carbon and nitrogen concentrations, grassland ecological restoration, and evaluation framework and modeling of ecological restoration's effects. Currently, studies focus on river basin remediation, heavy metal removal, and forest restoration. (3) Future ecological restoration research should strengthen the multi-object aspect and multi-scale ecological restoration research, improve the ecological restoration effect evaluation system, and incorporate social and economic issues. This study identified current research hotspots and predicted potential future research directions, providing a scientific reference for future studies in the field of ecological restoration.

6. Towards an integrated approach for land spatial ecological restoration zoning based on ecosystem health assessment

作者：Tianyu Lv, Chen Zeng, Chuxuan Lin, Wenping Liu, Yijiao Cheng, Yangbiao Li

文献源：Ecological Indicators, 2023

摘要：Mitigating ecosystem degradation has been a worldwide strategy, and China has been implementing land spatial ecological restoration for an all-around ecological preservation in recent years. A comprehensive diagnosis of the ecosystem health status and an effective division of spatial zoning are essential to formulating and implementing ecological restoration strategies at the regional scale. Here, the ecosystem health index (EHI) was computed for the years 2010 and 2020 using the vigor-organization-resilience model. Then, a three-step statistic-based, spatial continuity-based, and practice-based (SSP) zoning framework was developed to

classify land spatial ecological restoration zones with the consideration of ecosystem health status, spatial relation, and local practices. We applied the integrated zoning approach using the urban agglomeration in the middle reaches of Yangtze River (UAMRYR) in China as the study area. The results showed that: (1) the EHI had a slight decreasing trend from 2010 to 2020, with a spatial distribution pattern of healthy, unhealthy, and to healthy from the center to the periphery in the UAMRYR. (2) Eight land spatial ecological restoration zones were designated and adjusted through the SSP zoning framework to be space-full and practical. Zone VIII accounted for the largest proportion (41.12%), followed by the Zone I (21.57%). (3) Finally, corresponding land spatial ecological restoration strategies were proposed for each zone. This study contributes to land spatial ecological restoration zoning and differentiated restoration strategies in the UAMRYR, shedding light on restoration regulation and Sustainable Development Goals achievement in China and global regions with complicated environmental problems.

7. Environmental laws and ecological restoration projects enhancing ecosystem services in China: A meta-analysis

作者: Tao Liu, Le Yu, Xin Chen, Hui Wu, Hui Lin, Chengxiu Li, Jiaru Hou

文献源: Journal of Environmental Management, 2023

摘要: In recent decades, China has implemented ecological restoration projects (ERPs) to improve biodiversity and ecosystem services (ESs), accordingly, a series of environmental laws were issued to guide ecological restoration. However, quantitative evaluation of the effectiveness of ERPs remains ambiguous. To respond to the UN Decade on Ecosystem Restoration (UNDER), we conducted a meta-analysis of 85 peer-reviewed publications and an interdisciplinary evaluation framework based on China's environmental protection and land administration laws (EPLALs) were established to assess the effectiveness of ERPs. We found that ERPs enhanced ESs by 15–58%. Specifically, ERPs implemented in industrial/mining, and wetland regions significantly increased regulating and cultural services, and in arid and semi-arid regions mainly enhance provisioning services (72.98%). Climate factors were found to be crucial for

ecological restoration effectiveness (temperature: $r = -0.582$, significance <0.05 ; precipitation: $r = 0.635$, significance <0.05). China's environmental laws emphasized management and investment in ecological restoration. However, the disclosure, public participation and real-time monitoring of ecological conditions need to be improved urgently. We therefore developed ERP-related policy recommendations and global lessons to help improve the effectiveness of ecological restoration.

【科学数据】

1. 青藏高原耕地利用强度要素数据（1985-2020）

摘要：在第二次青藏高原综合考察专项的资助下，课题组收集了青藏高原的县级统计数据，将青藏高原的县级农业指标数据，主要为化肥使用量、农药使用量、地膜使用量、灌溉面积、机械总动力，根据 DEM、人口分布、NPP 等辅助数据，空间化至栅格图上，将各指标数据标准化，采用熵权法确定各项指标权重后集总，得出各耕地栅格的利用强度，最后采用等距离间隔分为 5 类，其中 1 为低强度利用，2 为中低强度利用，3 为中强度利用，4 为中高强度利用，5 为高强度利用。

链接：

<https://data.tpdc.ac.cn/zh-hans/data/a4780ad9-ce0e-4458-99f8-2bbef80c173d>

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