



生态学报

ACTA ECOLOGICA SINICA

第45卷 第5期 Vol.45 No.5 2025 ISSN 1000-0933 CN 11-2031/Q



中国生态学会
中国科学院生态环境研究中心

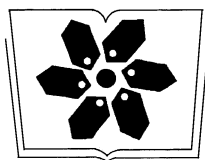
主办



科学出版社
Science Press

出版

方知库
Eco-Environmental
Knowledge Web



中国科学院科学出版基金资助出版

生态学报

(SHENGTAI XUEBAO)

第 45 卷 第 5 期 2025 年 3 月 (半月刊)

目 次

专论与综述

- 基于空天地多源数据的大型食草动物调查与种群密度估算研究进展 王东亮 (2025)
- 中国生态清洁小流域综合治理研究进展 刘 晔, 张守红, 李华林, 等 (2042)
- 基于复合生态系统视角的土地利用变化碳源/汇效应研究进展 张鹏岩, 杨 丹, 刘 宇, 等 (2058)

土壤生态专栏

- 藏东南高寒森林土壤固氮菌群落结构与固氮速率随海拔梯度的变化规律
..... 吉毛加, 张首超, 王瑞红, 等 (2074)
- 祁连山青海云杉林土壤纤毛虫的分布及演替——两种计数法的比较研究
..... 陈凌云, 龙永丽, 申啸天, 等 (2084)
- 南方红壤侵蚀区马尾松林植被恢复对土壤氮有效性和微生物量碳、氮季节动态的影响
..... 刘 政, 索沛衡, 轩寒风, 等 (2094)
- 中国土壤甲烷吸收时空格局及其驱动因素 薛良琛, 宋翰雄, 吴晓丽, 等 (2104)
- 外源碳输入对苔原土壤有机碳矿化和组分的影响 张思琪, 王彩玲, 许嘉巍, 等 (2122)
- 沿黄灌区盐碱地不同盐生植物根际土壤细菌群落特征和生态功能预测
..... 贺世龙, 叶 贺, 赵 宇, 等 (2141)
- 气候和植被影响土壤理化性质及微生物对氮添加的响应——全球控制实验 Meta 分析
..... 吴传敬, 张雨雪, 肖 杨, 等 (2152)

黄河流域湿地生态系统研究专栏

- 1986—2024 年若尔盖湿地景观演变及其驱动因素 邱梦琪, 刘焱序, 刘 涛, 等 (2162)
- 黄河三角洲盐沼湿地乡土植物恢复配置对潮流的调控作用模拟 刘佳凯, 赵世强, 王婧雯, 等 (2173)
- 耦合物种交互关系及栖息地时空分异的多因素候鸟分布机制 徐逸飞, 李 翊 (2184)
- 不同水位泥炭地铁、铝矿物复合体及有机碳形态分布特征 付 玮, 陈 槐, 王尹佳, 等 (2200)
- 北京市生态系统服务演变及其对城市化的多尺度响应 田慧霞, 覃阳毅, 李祖政, 等 (2209)
- 喀斯特生态系统服务对农户福祉的影响跨尺度解析——以环江县为例 高小艳, 王 强, 陈田田 (2225)
- 微观尺度下乡村生态系统文化服务供需匹配特征——以宁德市廉村为例
..... 李从治, 潘 滢, 尹伟伦, 等 (2243)
- 长株潭都市圈绿色空间分布特征及其公平性 陈慧灵, 杨雪珂, 袁 梦, 等 (2255)
- 三江源国家公园建设对牧民生计结果与行为的影响 李军辉, 陈文烈 (2268)
- 基于优化的支持向量机模型评估和预测社会-生态系统脆弱性——以陕南秦巴山区为例
..... 李润阳, 陈 佳, 杨新军, 等 (2281)

黄河流域不同生态地理区草地生态系统脆弱性及其驱动因素	程 静,王 鹏,赵文智,等 (2298)
基于“结构-功能-胁迫”的江苏省土地利用转型与生态环境响应	杨春花,乔伟峰,李 琛,等 (2311)
基于价格随机的苏北杨树人工林多碳库最优轮伐模型构建与评估	王晓雯,余智涵,杨红强 (2326)
祁连山不同海拔青海云杉天然更新空间格局变化	刘济萌,刘贤德,马 瑞,等 (2337)
北京东灵山地区典型灌丛碳密度分配格局	张建华,周晓阳,马 卉,等 (2346)
广州城市中央湿地草本层生态位特征	李 晖,刘龙英,郭婉琪,等 (2355)
中国农业生产力对森林覆盖率的影响实证分析	张红亮,杨子涵,吴 健 (2364)
神农架南坡小叶青冈+曼青冈林木残体空间分布及地形关联	刘明伟,赵常明,陈聪琳,等 (2374)
黄河乌兰布和沙漠段不同生长时期植物叶功能性状特征	郝需婷,黄雅茹,张 帅,等 (2386)
基于一维卷积神经网络与自编码算法的松属物种鉴别机制	陈冬英,翁伟雄,陈培亮,等 (2401)
中国植被对气候变化的敏感性定量分析	张韬略,姜亮亮,刘 冰,等 (2412)
高原鼯鼠牧食洞道干扰对高寒草地生态系统植物碳库密度的影响	杨 欢,金玉洁,段媛媛,等 (2424)
雌雄异株植物髯脉槭繁殖成本变化的性别差异响应	王艺彤,郭汉麟,廖 丹,等 (2436)
亚热带 4 个树种不同器官 C、N、P 化学计量比及其异速关系	梁婷婷,方 晰,孙 龙,等 (2449)
基于地球静止卫星观测的华北平原冬小麦光合作用日循环研究	彭浩宇,孙雷刚,王绍强,等 (2464)
重庆岩溶区和非岩溶区植被净初级生产力时空演变特征及其驱动因素	李 慧,魏兴萍 (2479)
不同月份麋鹿食源植物 $\delta^{13}\text{C}$ 和 $\delta^{15}\text{N}$ 及其贡献率分析	赵璐瑶,吴永波,查晶晶,等 (2494)
鸛科候鸟迁徙时间模式的种内和种间差异分析	周安强,陈 莹,王一桐,等 (2505)

学术信息与动态

基于文献计量分析的草原生态补偿研究进展	陈 烨,董世魁,常智慧 (2516)
生物多样性信用研究现状、热点及启示——基于 CiteSpace 的可视化分析	韩丽丽,何友均,朱震锋,等 (2529)

期刊基本参数:CN 11-2031/Q * 1981 * m * 16 * 520 * zh * P * ¥ 120.00 * 1510 * 40 * 2025-03



封面彩图提供:刘书哲 E-mail:327989543@qq.com

ACTA ECOLOGICA SINICA Vol.45, No.5 March, 2025 (Semimonthly)

CONTENTS

Review and Monograph

- Research progress on large herbivore surveys and population density estimation based on spaceborne, airborne, and terrestrial multi-source datasets WANG Dongliang (2025)
- Eco-environment friendly small watershed: a literature review LIU Ye, ZHANG Shouhong, LI Hualin, et al (2042)
- Carbon source/sink effect of land use change from the perspective of composite ecosystem: progress and review ZHANG Pengyan, YANG Dan, LIU Yu, et al (2058)

Soil Ecology Special Topic

- Variation of soil nitrogen-fixing bacterial community structure and nitrogen fixation rate with altitude gradient in alpine forests in southeastern Xizang JI Maojia, ZHANG Shouchao, WANG Ruihong, et al (2074)
- Study on soil ciliate reserves and quantitative methods in *Picea crassipes* Forest in Qilian Mountains CHEN Lingyun, LONG Yongli, SHEN Xiaotian, et al (2084)
- Seasonal dynamics of soil nitrogen availability and microbial biomass carbon, nitrogen along restoration ages of *Pinus massoniana* plantations in red soils erosion region at southern China LIU Zheng, SUO Peiheng, XUAN Hanfeng, et al (2094)
- Estimating the spatiotemporal patterns and the key drivers of methane uptake in upland of China XUE Liangchen, SONG Hanxiong, WU Xiaoli, et al (2104)
- Effects of exogenous carbon inputs on soil organic carbon mineralization and its components in the tundra ZHANG Siqi, WANG Cailing, XU Jiawei, et al (2122)
- Characteristics and ecological function prediction of rhizosphere bacterial communities of different halophytes in saline-alkali land of the Yellow River irrigation area HE Shilong, YE He, ZHAO Yu, et al (2141)
- Climate and vegetation influence the responses of soil and microbial traits to nitrogen addition: a meta-analysis of global manipulative experiments WU Chuanjing, ZHANG Yuxue, XIAO Yang, et al (2152)

Wetland Ecosystem Research in Yellow River Basin, China

- Landscape dynamics and its driving factors in Zoige Wetlands from 1986 to 2024 QIU Mengqi, LIU Yanxu, LIU Tao, et al (2162)
- Currents regulation modelling of native plant restoration in the Yellow River Delta LIU Jiakai, ZHAO Shiqiang, WANG Jingwen, et al (2173)
- Study on the multi-factor distribution mechanisms of migratory birds: coupling species interactions and spatiotemporal differentiation of habitats XU Yifei, LI Chi (2184)
- Distribution characteristics of iron and aluminum mineral complexes and organic carbon forms in peatlands with different water levels FU Wei, CHEN Huai, WANG Yinjia, et al (2200)
- Changes of ecosystem services in Beijing and its multi-scale response to urbanization TIAN Huixia, QIN Yangyi, LI Zuzheng, et al (2209)
- Cross-scale impact of ecosystem service on households' well-being in karst regions: a case study of Huanjiang County GAO Xiaoyan, WANG Qiang, CHEN Tiantian (2225)
- Supply and demand matching characteristics of rural cultural ecosystem services at micro scale: a case study of Lian Village in Ningde City, China LI Congzhi, PAN Ying, YIN Weilun, et al (2243)
- The distribution characteristics and equity of green space in ChangZhuTan metropolitan area CHEN Huiling, YANG Xueke, YUAN Meng, et al (2255)
- The impact of the construction of the Three-Rivers-Source National Park on the livelihood results and behavior of herdsmen LI Junhui, CHEN Wenlie (2268)
- Assessment and prediction of social-ecological systems' vulnerability based on optimized SVM model: a case study of the Qinling-Daba Mountains in southern Shaanxi LI Runyang, CHEN Jia, YANG Xinjun, et al (2281)
- Vulnerability and spatial drivers of grassland ecosystems in different eco-geographical zones of the Yellow River Basin CHENG Jing, WANG Peng, ZHAO Wenzhi, et al (2298)

- Land use transition and eco-environmental responses in Jiangsu Province based on Structure-Function-Stress YANG Chunhua, QIAO Weifeng, LI Chen, et al (2311)
- Construction and evaluation of the optimal rotation model for multi carbon storage of poplar plantations in northern Jiangsu based on price stochasticity WANG Xiaowen, YU Zhihan, YANG Hongqiang (2326)
- Changes in the spatial pattern of natural regeneration of *Picea crassifolia* at different elevations in the Qilian Mountains LIU Jimeng, LIU Xiande, MA Rui, et al (2337)
- Carbon density and its spatial distribution pattern of typical shrublands in Mt. Dongling, Beijing, China ZHANG Jianhua, ZHOU Xiaoyang, MA Hui, et al (2346)
- Niche characteristics of herbaceous layer in the central wetland of Guangzhou City LI Hui, LIU Longying, GUO Wanqi, et al (2355)
- The impact of agricultural productivity on forest cover in China ZHANG Hongliang, YANG Zihan, WU Jian (2364)
- Spatial distribution and topographic associations of woody debris in *Cyclobalanopsis myrsinifolia*+*Cyclobalanopsis oxyodon* forest on the southern slopes of Shennongjia LIU Mingwei, ZHAO Changming, CHEN Conglin, et al (2374)
- Characteristics of leaf functional traits of plants at different growth stages in the Ulan Buhe desert section of the Yellow River HAO Xuting, HUANG Yaru, ZHANG Shuai, et al (2386)
- Identification mechanism of *Pinus* species based on one dimensional convolutional neural network model and self-coding algorithm CHEN Dongying, WENG Weixiong, CHEN Peiliang, et al (2401)
- Quantitative analysis of vegetation sensitivity to climate change in China ZHANG Taolue, JIANG Liangliang, LIU Bing, et al (2412)
- Effect of foraging tunnel disturbances created by plateau zokor on plant carbon pool density in different types of alpine grassland ecosystems YANG Huan, JIN Yujie, DUAN Yuanyuan, et al (2424)
- Gender difference response to the change of reproductive cost of dioecious plant *Acer barbinerve* Maxim. WANG Yitong, GUO Hanlin, LIAO Dan, et al (2436)
- The stoichiometric ratio and allometric relationships of C, N, and P in different organs of four subtropical tree species LIANG Tingting, FANG Xi, SUN Long, et al (2449)
- Diurnal cycle of winter wheat photosynthesis in the North China Plain based on geostationary satellite observations PENG Haoyu, SUN Leigang, WANG Shaoqiang, et al (2464)
- Comparative study on spatio-temporal evolution and driving factors of NPP in karst and non-karst areas of Chongqing LI Hui, WEI Xingping (2479)
- Analysis of the $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values and their contribution rates in dietary plants of *Elaphurus davidianus* in different months ZHAO Luyao, WU Yongbo, ZHA Jingjing, et al (2494)
- Analysis on intraspecific and interspecific differences in timing patterns of migration of thrushes (Turdidae) ZHOU Anqiang, CHEN Ying, Wang Yitong, et al (2505)

《生态学报》

Acta Ecologica Sinica

入选“中国科技期刊卓越行动计划”;入围“中国科协生态学领域高质量科技期刊 T1 区”

《生态学报》是由中国科学技术协会主管,中国生态学学会、中国科学院生态环境研究中心主办的生态学高级专业学术期刊,半月刊,主编傅伯杰院士。本刊坚持百花齐放、百家争鸣,产生于科学性、立足于学术性、着眼于实践性、服务于社会性的办刊宗旨,依靠和团结广大生态学科研工作者,为生态学基础理论和应用研究搭建国内一流的学术交流平台,促进生态学研究深入发展,为我国培养和造就生态学科研人才,为国民经济建设和发展提供知识创新服务。

《生态学报》主要报道生态学重要基础理论和应用研究的原始创新性科研成果。所刊文章类型有:研究综述;研究论文;学术信息与动态;生态学新理论、新方法、新技术介绍;新书评介及开放实验室介绍等。《生态学报》为国内一流领军期刊;国际生态学 Q1 类期刊;期刊总被引频次居中国自然科学期刊第 1 名,影响因子居生态学学科中文期刊第 1 名;连年获得“中国百种杰出学术期刊”、“中国最具国际影响力学术期刊”和“期刊数字影响力 100 强”等荣誉称号;获得中国科协 TOP50 科技期刊和中国科协中文精品科技期刊建设项目资助;中国科协生态学领域高质量科技期刊 T1 区期刊;中国科技期刊卓越行动计划入选期刊。

办公室电话: 010-62941099

E-mail: shengtaixuebao@rcees.ac.cn

投稿网址: www.ecologica.cn

若未订阅,但需本刊某期纸质本,请联系科学出版社购买,电话:010-64017032,010-64017539

执行副主编 全元 责任编辑 刘昕 谢武双 于恩逸 朱晶莹 编辑 宗静 彭小琼 刘佩琼 孔红梅

生态学报
(SHENGTAI XUEBAO)
(半月刊 1981 年 3 月创刊)
第 45 卷 第 5 期 (2025 年 3 月)

ACTA ECOLOGICA SINICA
(Semimonthly, Started in 1981)
Vol.45 No.5 (March, 2025)

编辑 《生态学报》编辑部
地址:北京海淀区双清路 18 号
邮政编码:100085
电话:010-62941099
www.ecologica.cn
shengtaixuebao@rcees.ac.cn

Edited by Editorial board of
ACTA ECOLOGICA SINICA
Add:18, Shuangqing Street, Haidian, Beijing 100085, China
Tel:010-62941099
www.ecologica.cn
shengtaixuebao@rcees.ac.cn

主编 傅伯杰
主管 中国科学技术协会
主办 中国生态学学会
中国科学院生态环境研究中心
地址:北京海淀区双清路 18 号
邮政编码:100085

Editor-in-chief FU Bojie
Supervised by China Association for Science and Technology
Sponsored by Ecological Society of China
Research Center for Eco-environmental Sciences, CAS
Add:18, Shuangqing Street, Haidian, Beijing 100085, China

出版 科学出版社

Published by Science Press
Add:16 Donghuangchenggen North Street,
Beijing 100071, China

印刷 北京宝昌彩色印刷有限公司

Printed by Beijing Baochang Color Printing Co., Ltd,
Beijing 100094, China

国内发行 全国各地邮局

邮发代号 82-7

Subscribe by Science Press
Tel:010-64017032, 010-64017539
E-mail: journal@cspg.net

国外发行 中国国际图书贸易总公司

发行代号 M670

订阅 科学出版社期刊发行部
010-64017032, 010-64017539
或扫描封底二维码

Domestic issue All Local Post Offices in China 82-7
Foreign issue China International Book Trading M670
Corporation
Add: P.O.Box 399 Beijing 100044, China

广告经营 京海工商广字第 8013 号



ISSN 1000-0933

CN 11-2031/Q

定价 120.00 元