



生态学报

ACTA ECOLOGICA SINICA

第42卷 第22期 Vol. 42 No. 22 2022

ISSN 1000-0933 CN 11-2031/Q



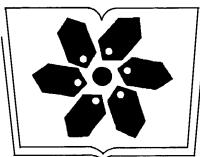
中国生态学会
主办
中国科学院生态环境研究中心



科学出版社
Science Press

出版

白方知库
Eco-Environmental
Knowledge Web



中国科学院科学出版基金资助出版

生态学报 (SHENTAI XUEBAO)

第 42 卷 第 22 期 2022 年 11 月 (半月刊)

目 次

青藏高原生物多样性保护与生态安全专栏

- 近 40 年青藏高原生态格局演变及其驱动因素 王子滢, 李周园, 董世魁, 等 (8941)
基于机器学习算法的草地地上生物量估测——以祁连山草地为例 张子慧, 吴世新, 赵子飞, 等 (8953)
藏东木本植物群落功能性状分布与环境的关系 黄汐月, 陈 阜, 黄梦月, 等 (8964)
藏东南急尖长苞冷杉群落空间点格局分析及其时空动态 朱文婷, 刘海坤, 何 睿, 等 (8977)
气候变化背景下青藏高原藏羚羊生境时空格局演变 王秋生, 温 璐, 苏旭坤 (8985)
高寒草甸物种多样性对藏系牧羊放牧行为的影响 郑昊哲, 张 岩, 张 涛, 等 (8994)
西藏年楚河流域湿地土壤纤毛虫群落特征 朱时应, 王壮壮, 黄 倩, 等 (9005)

- 甘草根际土壤微生物群落对长期连作的响应 张 敏, 马 森 (9017)
苏干湖湿地土壤全盐含量特征及其与地下水的关联 康满萍, 赵成章, 李 群 (9026)
深圳市前海桂湾公园土壤蒸发及植被蒸腾模拟 张珈玮, 陈 晗, 黄津辉, 等 (9035)
华西雨屏区常绿阔叶林不同深度土壤氮矿化及酶活性对模拟氮沉降的响应
..... 宋思意, 吕思扬, 邱岭军, 等 (9045)
半干旱黄土区植被恢复对土壤团聚体稳定性及抗侵蚀能力的影响 张钦弟, 刘剑荣, 杨 磊, 等 (9057)
晋西北丘陵风沙区柠条林下草本植物群落组成和种群生态位变化特征
..... 缪倩倩, 刘 婧, 王国华, 等 (9069)
云龙天池国家级保护区云南松种群年龄结构及动态分析 张锦堂, 潘志立, 田云海, 等 (9091)
喜旱莲子草在增温背景下的密度制约与生长权衡 王淳淳, 张桥英, 张运春, 等 (9100)
1975—2020 年疏勒河流域绿洲时空变化研究 孙旭伟, 李 森, 王亚晖, 等 (9111)
森林光环境对 4 种乔木幼树光合和光谱反射特性的影响 黄一鑫, 程艳霞 (9121)
黄土高原油松冠层气孔导度和蒸腾变化特征与模拟 朱昊阳, 李洪宇, 王晓蕾, 等 (9130)
凋落物和根系输入对南亚热带季风常绿阔叶林土壤养分的影响 庞宗清, 陈伟彬, 苏芳龙, 等 (9143)
亚热带不同纬度森林群落物种空间分布格局 温智峰, 魏识广, 李 林, 等 (9153)
植被覆盖度对夏季降温效应的影响——以内蒙古为例 博文静, 沈钰仟, 王馨悦, 等 (9165)
干旱胁迫下柳枝稷在露天矿区土壤中的种子萌发和生长特性 邓 杨, 王 瑶, 郭洋楠, 等 (9175)
闽江河口芦苇沼泽和短叶茳芏沼泽生态系统含碳温室气体的年收支 林晓雪, 黄佳芳, 李 慧, 等 (9186)
农业空间半自然生境内涵、特征与识别 刘静萍, 金晓斌, 韩 博, 等 (9199)
地膜覆盖对旱作春玉米农田土壤微生物碳源代谢的影响 刘美霞, 刘 秀, 赵 燕, 等 (9213)
基于历史参照系的三江源区径流调节功能及变化评估 孙倩莹, 高艳妮, 杨春艳, 等 (9226)

- 秦岭南坡子午河中下游流域土地利用/土地覆被信息提取及其应用 陈 航,王 颖,张 昕,等 (9239)
基于水源涵养参照系的中国生态系统水源涵养功能优劣评估 张昌顺,谢高地,刘春兰,等 (9250)
近30年鄱阳湖滨岸缓冲带土地利用变化及生态系统服务价值 魏佳豪,温玉玲,龚志军,等 (9261)
基于¹³⁷Cs 示踪技术的土壤侵蚀及养分流失特征评价 张宁宁,黄诗浩,雷 衡,等 (9274)
干旱区绿洲城市树木健康评估及影响因素——以乌鲁木齐市为例
..... 谢璐迪,玉米提·哈力克,史 磊,等 (9284)
气候、径流及河漫滩湿地淹没状态耦合关系研究——以海拉尔河下游段为例
..... 董 熙,陈志泊,胡春明,等 (9297)
区域尺度无人机涡动相关通量观测系统的应用研究 孙义博,张文字,苏 德,等 (9309)
基于TOPSIS模型的海南岛土地综合承载力时空变化及障碍度诊断 杨秀敏,耿 静,徐 游,等 (9324)
基于空间面板 STIRPAT 模型的水足迹影响因素分析——以山东省为例
..... 刘 宁,李华姣,边志强,等 (9335)
样线法和网捕法在机场鸟情调查中的应用比较 金麟雨,李舒萌,刘艳艳,等 (9348)
水体升温和生态情境对异育银鲫群体行为的影响 李武新,马辉煌,于长暄,等 (9359)
青海湖裸鲤自然产卵场的生境特征及无人机遥测判别——以泉吉河为例
..... 荣义峰,班 璇,周杨浩,等 (9371)
种间互作对雷州湾海域鱼类群落结构的影响 潘士远,林 坤,吕少梁,等 (9383)
基于GIS和Maxent模型的白唇鹿(*Cervus albirostris*)潜在适宜生境及保护GAP分析
..... 唐中海,罗华林,王建华,等 (9394)

期刊基本参数:CN 11-2031/Q * 1981 * m * 16 * 464 * zh * P * ￥90.00 * 1510 * 40 * 2022-11



封面彩图提供: 丁大鹏 E-mail: 28835652@qq.com

ACTA ECOLOGICA SINICA Vol.42, No.22 November, 2022 (Semimonthly)
CONTENTS

Biodiversity Conservation and Ecological Security on the Qinghai-Tibetan Plateau

- Evolution of ecological patterns and its driving factors on Qinghai-Tibet Plateau over the past 40 years WANG Ziyang, LI Zhouyuan, DONG Shikui, et al (8941)
Estimation of grassland biomass using machine learning methods: A case study of grassland in Qilian Mountains ZHANG Zihui, WU Shixin, Zhao Zifei, et al (8953)
Functional traits of woody plants along the environmental gradients in eastern Tibet HUANG Xiyue, CHEN Zhuo, HUANG Mengyue, et al (8964)
Spatial point pattern analysis and spatio-temporal dynamics of *Abies georgei* var. *smithii* forests in southeast Tibet ZHU Wenting, LIU Haikun, HE Rui, et al (8977)
Spatial-temporal pattern changes of Tibetan antelope's habitats on the Qinghai-Tibetan Plateau under climate change scenarios WANG Qiusheng, WEN Lu, SU Xukun (8985)
Effects of species diversity on grazing behavior of Tibetan sheep in an alpine meadow ZHENG Haozhe, ZHANG Yan, ZHANG Tao, et al (8994)
Characteristics of soil ciliate community in wetland of the Nianchu River Basin, Tibet, China ZHU Shiying, WANG Zhuangzhuang, HUANG Qian, et al (9005)

Response of rhizosphere soil microbial community to long-term continuous cropping of *Glycyrrhiza glabra* L. ZHANG Min, MA Miao (9017)
Characteristics of soil total salt content and its correlation with groundwater in Sugan Lake wetland KANG Manping, ZHAO Chengzhang, LI Qun (9026)
Simulation of soil evaporation and vegetation transpiration in Qianhai Guiwan Garden of Shenzhen ZHANG Jiawei, CHEN Han, HUANG Jinhui, et al (9035)
Responses of soil nitrogen mineralization and enzyme activities at different depths to nitrogen additions in an evergreen broad-leaved forest SONG Siyi, LÜ Siyang, QIU Lingjun, et al (9045)
Effect of vegetation restoration on stability and erosion resistance of soil aggregates in semi-arid loess region ZHANG Qindi, LIU Jianrong, YANG Lei, et al (9057)
Changes of herbaceous plant composition and niche characteristics in different-aged artificial *Caragana korshinskii* forest in sandy-hilly region of northwest Shanxi Province, China GOU Qianqian, LIU Jing, WANG Guohua, et al (9069)
Age structure and dynamics of *Pinus yunnanensis* population in Yunlong Tianchi Nature Reserve ZHANG Jintang, PAN Zhili, TIAN Yunhai, et al (9091)
Density dependence and growth trade-off of *Alternanthera philoxeroides* under warming WANG Tingting, ZHANG Qiaoying, ZHANG Yunchun, et al (9100)
Spatiotemporal change of oasis in Shule River Basin during 1975—2020 SUN Xuwei, LI Sen, WANG Yahui, et al (9111)
Photosynthetic characteristics and spectral reflectance characteristics of four natural tree saplings under forest light environment HUANG Yixin, CHENG Yanxia (9121)
Characteristics and modeling of canopy stomatal conductance and transpiration of *Pinus tabuliformis* on the Loess Plateau ZHU Haoyang, LI Hongyu, WANG Xiaolei, et al (9130)
Short-term effects of altered litter and root inputs on soil water-extractable ions in a subtropical monsoon evergreen broadleaf forest, Southern China PANG Zongqing, CHEN Weibin, SU Fanglong, et al (9143)
Spatial distribution patterns of forest community species at different latitudes in the subtropics WEN Zhifeng, WEI Shiguang, LI Lin, et al (9153)
The influence of vegetation coverage on cooling effect in summer: A case study of the Inner Mongolia BO Wenjing, SHEN Yuqian, WANG Xinyue, et al (9165)
Effect of drought stress on the seed germination and growth characteristics of switchgrass DENG Yang, WANG Yao, GUO Yangnan, et al (9175)

Annual carbon gases budgets for <i>Phragmites australis</i> marsh and <i>Cyperus malaccensis</i> marsh in the Minjiang River estuary	LIN Xiaoxue, HUANG Jiafang, LI Hui, et al (9186)
Connotation, characteristics and recognition of semi-natural habitats in agricultural space	LIU Jingping, JIN Xiaobin, HAN Bo, et al (9199)
Effects of film mulching on soil microbial carbon source metabolism in dry-farmland	LIU Meixia, LIU Xiu, ZHAO Yan, et al (9213)
Assessment of runoff regulation function and its change in the Three Headwater Region based on a historical reference system	SUN Qianying, GAO Yanni, YANG Chunyan, et al (9226)
Extraction and application of land use/land cover information in the middle and lower reaches of Ziwi River on the south slope of Qinling Mountains	CHEN Hang, WANG Ying, ZHANG Xin, et al (9239)
Evaluation of water conservation of China's ecosystems based on benchmark	ZHANG Changshun, XIE Gaodi, LIU Chunlan, et al (9250)
Land use changes and ecosystem service value in the buffer zone of Poyang Lake in recent 30 years	WEI Jiahao, WEN Yuling, GONG Zhijun, et al (9261)
Assessment of soil erosion and nutrient loss characteristics based on ¹³⁷ Cs tracer technique	ZHANG Ningning, HUANG Shihao, LEI Heng, et al (9274)
Health assessment of urban trees in arid land oasis cities and its influencing factors: a case study of Urumqi	XIE Ludi, Ümüt HALIK, SHI Lei, et al (9284)
Coupling relationship between climate, runoff and inundation state of river floodplain wetlands in the lower section of the Hailar River	DONG Xi, CHEN Zhibo, HU Chunming, et al (9297)
Study on application of the regional scale UAV-based flux measurement system	SUN Yibo, ZHANG Wenyu, SU De, et al (9309)
Spatio-temporal change and obstacle degree diagnosis of comprehensive land carrying capacity in Hainan Island based on TOPSIS model	YANG Xiumin, GENG Jing, XU You, et al (9324)
Influence factors of water footprint based on spatial panel STIRPAT Model: A case study of Shandong Province	LIU Ning, LI Huajiao, BIAN Zhiqiang, et al (9335)
Comparisons of line transect and mist-net capture in bird surveys applied in airports	JIN Linyu, LI Shumeng, LIU Yanyan, et al (9348)
Effects of water temperature rising and ecological context on collective behaviour of gibel carp	LI Wuxin, MA Huihuang, YU Changxuan, et al (9359)
The spawning habitat characteristics of <i>Gymnocypris przewalskii</i> and its identification by the UAV in tributary of Qinghai Lake-taking Quanji River as an example	RONG Yifeng, BAN Xuan, ZHOU Yanghao, et al (9371)
Importance of species interactions in structuring fish community of Leizhou Bay waters, northern South China Sea	PAN Shiyuan, LIN Kun, LÜ Shaoliang, et al (9383)
Potential suitable habitat and protection gap analysis of white-lipped deer (<i>Cervus albirostris</i>) based on GIS and Maxent model	TANG Zhonghai, LUO Hualin, WANG Jianhua, et al (9394)

《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。

办公电话：010-62941099

E-mail: shengtaixuebao@rcees.ac.cn

投稿网址：www.ecologica.cn

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

生 态 学 报
(SHENGTAI XUEBAO)
(半月刊 1981 年 3 月创刊)
第 42 卷 第 22 期 (2022 年 11 月)

ACTA ECOLOGICA SINICA
(Semimonthly, Started in 1981)
Vol.42 No.22 (November, 2022)

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

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

出 版 科 学 出 版 社
印 刷 北京宝昌彩色印刷有限公司
国内发行 全国各地邮局
发行代号 82-7
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
广告经营 京海工商广字第 8013 号

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

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

Published by Science Press
Add: 16 Donghuangchenggen North Street,
Beijing 100717, China

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

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

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

ISSN 1000-0933
22
9 771000093224



ISSN 1000-0933 CN 11-2031/Q 定价 90.00 元