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中国野生动物保护协会鹤类联合保护委员会
United Crane Conservation Committee of China Wildlife Conservation Association

马逸清先生（左一）参加扎龙保护区建立前考察

马逸清先生（右四）同马建章教授王岐山教授考察扎龙保护区

马逸清先生（左一）与国际鹤类基金会互赠礼物

马逸清先生（左一）在日本考察时与正富弘之交流

马逸清先生为阿奇博七十岁生日赠送墨宝

耄耋之年的马逸清先生用放大镜笔耕不辍

世界著名鹤类研究专家 黑龙江省科学院生态与自然研究所研究员
马逸清（1931 - 2025）

感谢马逸清先生在中国乃至世界丹顶鹤保护研究中所作出的核心推动和卓越贡献。

MA Yiqing（1931 - 2025）

Professor MA Yiqing has made core contributions and outstanding achievements in the protection and research of Red-crowned cranes in China and even around the world.

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李浙[1] 孙雪莹[1] 徐卓[2] 宋曦濂[1] DEBELA MEGERSA TSEGAYE[1] 邓文攸[1] 陈露[1] 吴庆明[1] 邹红菲[1]
1 东北林业大学，黑龙江 哈尔滨 150040
2 黑龙江扎龙国家级自然保护区管理局，黑龙江 齐齐哈尔 161000

物种对栖息地的选择是从宏观到微观的决策过程，探讨不同尺度上物种对栖息地的选择机制，有利于濒危物种的保护与管理。本研究于 2020-2021 年迁徙期从景观尺度和微生境尺度探讨了中国黑龙江扎龙国家级自然保护区（简称扎龙保护区）白头鹤春秋不同季节觅食地生境利用，并进而分析了其觅食栖息地适宜性，以期为迁徙白头鹤的保护提出科学有效的管理策略。

研究表明：（1）景观尺度上，迁徙白头鹤优先偏好农田生境，同时偏好以农田、草地和轻沼泽为主要景观、分布均匀的区域。伴有树林的农田有利于白头鹤的分布，白头鹤回避大面积、聚集的明水面和湖泡。（2）微生境尺度上，迁徙白头鹤偏好于农田生境觅食，在植被高度、觅食区开阔面积、距水源距离、距农作路距离、距农田距离、距草地距离及距芦苇沼泽距离这些环境因子的选择上有明显差异。其中，春迁期，人为干扰要素对白头鹤觅食地选择影响最大，白头鹤距离农作路更远，需要较大的觅食范围；秋迁期，多生境需求和可觅食要素对白头鹤觅食地选择影响最大，白头鹤偏好于农田、草地和芦苇沼泽接壤区域觅食。（3）保护区及周边白头鹤适宜觅食面积，春迁期为 1792.7968 ha，呈大面积斑块分布；秋迁期为 803.7500 ha，呈条带状分布。整体而言，白头鹤适宜觅食面积为 2332.7656 ha，适宜面积分布具有明显的空间特征：保护区北部分布多、南部分布少；保护区周边分布偏多（54.82%）、其次是缓冲区和实验区（33.96%，10.38%）、核心区分布最少（0.83%）。适宜生境主要分布于保护区林甸区域内的黄牛场、军马场和小榆树等区域，铁锋区内的长沟、双图、后二道营子、葛家地房子、石家店和双岗子等区域，昂昂溪区内的龙头街、崔家店等区域。

基于此，保护区的管理应该提高农田、草地和轻沼泽景观之间的连通度；同时，秋迁期草地周边的玉米地若能早收割，将能增加秋迁期白头鹤可觅食生境面积。此外，保护区边界周边区域可适当设立季节性保护小区。

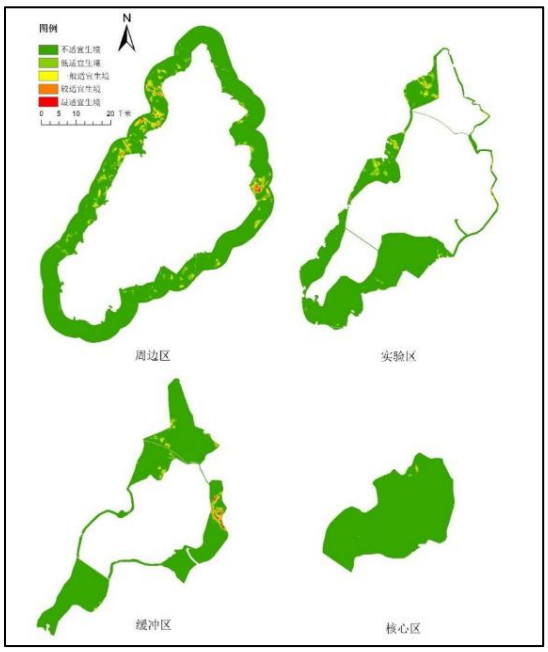

图 1. 白头鹤适宜觅食生境的空间分布
Figure 1. Spatial distribution of suitable foraging habitat for Hooded Cranes at Zhalong Nature Reserve

Feeding Habitat Selection and Habitat Suitability Assessment of Hooded Crane in Zhalong Nature Reserve under Coupling of Landscape Features

LI Zhe[1] SUN Xueying[1] XU Zhuo[2] SONG Xilian[1] DEBELA MEGERSA TSEGAYE[1] DENG Wenyou[1] CHEN Lu[1] WU Qingming[1] ZOU Hongfei[1]

1 Northeast Forestry University, Harbin 150040

2 Zhalong National Nature Reserve Management Bureau, Qiqihar 161000

The selection of habitats by species is a decision-making process that occurs from a macro to micro scale. Exploring the mechanisms behind habitat selection at different scales is beneficial for the conservation and management of endangered species. In this study, we examined the foraging habitat use of the Hooded Crane (*Grus monacha*) during spring and autumn migration periods in the Zhalong National Nature Reserve (referred to as Zhalong Reserve) in Heilongjiang Province, from 2020 to 2021 at both the landscape and microhabitat scales. The study further analyzes the suitability of foraging habitats, aiming to propose scientifically sound and effective management strategies for the conservation of migratory Hooded Cranes.

The research results indicate the following: (1) Landscape Scale: Migratory Hooded Cranes preferentially select farmland habitats and prefer areas with a combination of farmland, grasslands, and light marsh areas, distributed evenly across the landscape. Farmland areas with trees benefit activities of Hooded Cranes, while large, concentrated open water bodies and lake basins are avoided by the cranes. (2) Microhabitat Scale: Migratory Hooded Cranes prefer foraging in farmland habitats, and there are significant differences in their habitat selection based on environmental factors such as vegetation height, openness of foraging zones, distance to water sources, distance to farming roads, distance to farmland, distance to grasslands, and distance to reed marshes. During the spring migration period, human disturbance factors have the greatest impact on the cranes' foraging site selection. The cranes tend to forage farther from farming roads and require larger foraging areas. In the autumn migration period, the need for multiple habitats and foraging elements plays the largest role in influencing their habitat selection. The cranes show a preference for foraging in areas where farmland, grasslands, and reed marshes meet. (3) Foraging Habitat Suitability: During the spring migration, the suitable foraging area for Hooded Cranes in the reserve and surrounding areas is 1,792.80 ha, with a large patchy distribution. In the autumn migration, the suitable foraging area is 803.75 ha, with a more linear, strip-like distribution. Overall, the suitable habitat area is 2,332.77 ha, with a distinct spatial distribution pattern: more suitable habitat is found in the northern part of the reserve and less in the southern part. Suitable habitat distribution is more abundant in the area surrounding the reserve (54.82%), followed by the buffer zone (33.96%) and the experimental zone (10.38%). The core area has the least suitable habitat (0.83%). The most suitable habitats are concentrated in specific areas such as Huangniuchang, Junmachang, and Xiaoyushu in Lindiang County of the reserve, Changgou, Shuangtu, Houerdiaoyingzi, Gejiadianzi, Shijiadian, and Shuanggangzi in Tiefeng District, and Longtoujie and Cuijiadian in Ang'angxi District.

Based on these findings, management within the reserve should focus on enhancing the connectivity among farmland, grassland, and light marsh landscapes. In addition, if cornfields adjacent to grasslands are harvested earlier during the autumn migration period, the area of foraging habitat available to Hooded Cranes can be substantially increased. Furthermore, establishing seasonal conservation subzones in selected areas along the reserve’s boundary would provide additional protection for migratory individuals.

非繁殖期白鹤行为模式的群体差异与季节响应及气候影响分析

肖超[1] 孙雪莹[1] 徐卓[2] 邓文攸[1] 侯佳音[1] 周景英[3] 宋曦濂[1] 武明慧[1] 李小琴[1] 马悦[1] 吕泓学[1] 陈思[1]
李晓欢[1] 张晓雯[1] 吴庆明[1] 邹红菲[1]
1 东北林业大学，黑龙江 哈尔滨 150040
2 黑龙江扎龙国家级自然保护区管理局，黑龙江 齐齐哈尔 161000
3 内蒙古图牧吉国家级自然保护区管理局，内蒙古 扎赉特旗 137600

白鹤是全球极危鸟种，且近 99%的种群在我国长江流域中下游越冬，其濒危状态已引起各界人士的密切关注，并开展了多种形式的保护和全方位的系统研究。其中，行为学研究极为重要，尤其是行为影响因素方面，更是关系保护与管理的关键。为累积白鹤行为模式方面的生物学信息、为后续保护提供理论基础，本研究分别在江西鄱阳湖国家级自然保护区、内蒙古图牧吉国家级自然保护区、中国吉林莫莫格国家级自然保护区（分别简称鄱阳湖保护区、图牧吉保护区、莫莫格保护区），对非繁殖期（秋季迁徙期、越冬期、春季迁徙期）白鹤行为模式（群体差异、季节响应）及影响因素进行了研究，结果如下。

（1）白鹤行为模式存在季节差异。优势行为，秋迁期以觅食（38.52%）为主，越冬期觅食行为时间分配近 80%，而春迁期变为觅食（37.42%）和游走（31.19%）。次要行为，秋迁期为警戒、游走、理羽和站立，越冬期为游走、静栖、站立和理羽，春迁期仅有警戒。

（2）不同季节，白鹤行为模式存在群体差异。秋迁期，成鹤和幼鹤间静栖、站立、游走、理羽、觅食、警戒等行为均有极显著差异；越冬期二者在站立、游走、理羽、觅食、警戒等行为上有极显著差异；春迁期二者在静栖、游走、理羽、觅食、警戒等行为有极显著差异，站立行为有显著差异。觅食行为，秋迁期幼鹤时间分配远大于成鹤，而越冬期和春迁期成鹤则显著多于幼鹤。

（3）不同群体白鹤（成体和幼体）的行为模式均表现出季节响应。成鹤对越冬驱动在静栖、站立、游走、理羽、觅食、警戒上有极显著响应；觅食（越冬期时间分配最高）、游走（春＞秋＞冬）、警戒和站立（秋＞春＞冬）、理羽和静栖（秋＞冬＞春）的时间分配均表现出不同的季节响应。幼鹤的觅食（冬＞秋＞春）、静栖、站立、理羽（秋＞冬＞春）、游走和其他行为（春＞冬＞秋）、警戒（春＞秋＞冬）的时间分配均表现出不同的季节响应。

（4）不同气候要素（天气、温度、风力）对白鹤行为模式具有显著影响。不同天气情境下（晴、阴、雨），白鹤行为模式中，静栖、站立、运动、整理、觅食、警戒在时间分配上均有极显著响应；不同温度驱动下（[-3℃, 0℃）、[0℃, 7℃）、[7℃, 11℃）、[11℃, 15℃]），白鹤行为模式中，静栖、站立、运动、整理、觅食、警戒在时间分配上均有极显著响应；不同风力驱动下（轻风、微风、和风、劲风），白鹤行为模式在行为时间分配、优势行为方面表现出积极响应，在静栖、站立、运动、觅食、警戒方面存在极显著的风力驱动。

Analysis of Population Difference, Seasonal Response and Climate Impact of Behavior Pattern of Siberian Crane in Non-breeding Season

XIAO Chao[1] SUN Xueying[1] XU Zhuo[2] DENG Wenyou[1] HOU Jiayin[1] ZHOU Jingying[3] SONG Xilian[1]
WU Minghui[1] LI Xiaoqin[1] MA Yue[1] LV Hongxue[1] CHEN Si[1] LI Xiaohuan[1] ZHANG Xiaowen[1]
WU Qingming[1] ZOU Hongfei[1]
1 Northeast Forestry University, Harbin 150040
2 Zhalong National Nature Reserve Management Bureau, Qiqihar 161000
3 Tumuji Nature Reserve of Inner Mongolia, Zhalaiteqi 137600

The Siberian Crane (*Grus leucogeranus*) is a globally critically endangered species, with nearly 99% of

its global population wintering in the middle and lower reaches of China's Yangtze River Basin. Its endangered status has drawn close attention from various sectors of society and prompted the implementation of conservation actions and comprehensive, systematic research. Among these, behavioral studies are particularly important, especially those examining the factors key to species conservation and management. To accumulate biological information on behavioral patterns of Siberian Cranes and provide a theoretical foundation for subsequent conservation efforts, this study conducted from years 2020 to 2022, examined the behavioral patterns (group differences and seasonal responses) and influencing factors during the non-breeding period (autumn migration, wintering, and spring migration) across three major sites: Poyang Lake National Nature Reserve in Jiangxi Province, Tumuji National Nature Reserve in Inner Mongolia, and Momoge National Nature Reserve in Jilin Province (hereafter referred to as the Poyang Lake Reserve, Tumuji Reserve, and Momoge Reserve, respectively). The findings are as follows:

(1) Siberian Crane behavioral patterns exhibited clear seasonal differences. For dominant behaviors, foraging accounted for the highest proportion during the autumn migration period (38.52%), increased to nearly 80% during the wintering period, and the dominant behavior shifted to a combination of foraging (37.42%) and locomotion (31.19%) during the spring migration period. For secondary behaviors, individuals predominantly engaged in vigilance, locomotion, preening, and standing during autumn; locomotion, resting, standing, and preening during winter; and exclusively vigilance during spring.

(2) Behavioral patterns showed significant differences in age groups of juveniles and adults across seasons. During the autumn migration period, adults and juveniles differed extremely significantly in resting, standing, locomotion, preening, foraging, and vigilance. During the wintering period, the two groups again exhibited extremely significant differences in standing, locomotion, preening, foraging, and vigilance. During the spring migration period, adults and juveniles differed extremely significantly in resting, locomotion, preening, foraging, and vigilance, and significantly in standing. For foraging behavior, juveniles allocated considerably more time than adults during the autumn migration period, while during the wintering and spring migration periods, adults spent significantly more time foraging than juveniles.

(3) Both age groups (adults and juveniles) exhibited seasonal behavioral responses during the non-breeding period. Adults showed extremely significant seasonal responses (autumn – winter, winter – spring, and autumn – spring transitions) in resting, standing, locomotion, preening, foraging, and vigilance. The temporal allocations of these behaviors displayed clear seasonal patterns: Foraging: winter > autumn > spring. Locomotion: spring > autumn > winter. Vigilance & standing: autumn > spring > winter. Preening & resting: autumn > winter > spring. Juveniles also exhibited distinct seasonal responses in the temporal allocation of major behaviors: Foraging: winter > autumn > spring. Resting, standing, preening: autumn > winter > spring. Locomotion & other behaviors: spring > winter > autumn. Vigilance: spring > autumn > winter.

(4) Climatic factors (weather, temperature, wind) had significant effects on behavioral patterns. Across different weather conditions (sunny, cloudy, rainy), the time allocations of resting, standing, locomotion, preening, foraging, and vigilance all showed extremely significant responses. Under different temperature ranges ([-3℃, 0℃), [0℃, 7℃), [7℃, 11℃), [11℃, 15℃]), these six categories of behaviors also responded extremely significantly in terms of time allocation. Under different wind conditions (light breeze, gentle breeze, moderate breeze, fresh breeze), behavioral time allocation and dominant behaviors exhibited active responses, with extremely significant wind-driven effects on resting, standing, locomotion, foraging, and vigilance.

气候变化下蓑羽鹤潜在繁殖地评价与保护空缺研究

涂雅雯[1] 孙雪莹[2] 田一柳[3] 徐卓[4] 杜艳梅[5] 邓文攸[1] 宋曦濂[1] 吴庆明[1] 邹红菲[1]

1 东北林业大学，黑龙江 哈尔滨 150040

2 牡丹江师范学院，黑龙江 牡丹江 157011

3 齐齐哈尔市林业和草原站，黑龙江 齐齐哈尔 161000

4 黑龙江扎龙国家级自然保护区管理局，黑龙江 齐齐哈尔 161000

5 内蒙古辉河国家级自然保护区管理局，内蒙古 海拉尔 021100

蓑羽鹤（*Anthropoides virgo*）全球种群数量约为 17~22 万只，在欧亚大陆广泛分布。中国是蓑羽鹤的主要繁殖区之一，主要分为东部种群和西部种群；其中，西部种群在新疆北部巴音布鲁克、青海、甘肃等地繁殖；东部种群繁殖区包括内蒙古除阿拉善盟、巴彦淖尔盟北部的荒漠区以外的区域，以及黑龙江、吉林两省。目前吉林、黑龙江两省已多年未见蓑羽鹤繁殖记录。这种情境下，针对中国境内蓑羽鹤在黑龙江、吉林繁殖区已多年未见繁殖记录的现状，探究蓑羽鹤潜在繁殖地面积变化及保护的空缺，可为蓑羽鹤繁殖群体数量的稳定提供科学参考，直接关系其潜在繁殖地的科学管护。

本研究以东部草原亚区为研究区，评估不同气候情景下蓑羽鹤潜在繁殖地分布的变化，对照当前保护区分析其保护空缺。研究表明：（1）年均气温、年降水量、平均气温日较差、距水域距离是影响蓑羽鹤繁殖地分布的重要环境因子；（2）当前气候情景下，蓑羽鹤繁殖地高适生区面积为 15.42×10^3 km^2（占研究区面积的 2.54%），受保护面积 6.08×10^3 km^2，各等级适生区受保护比例均不足 60%；（3）未来气候情景下，高适生区随温室气体排放量增加而扩张，总适生区在高排放量情景下缩小，各等级适生区保护比例为 17.0%～39.6%，仍存在较大的保护空缺，且空缺面积有增长可能。

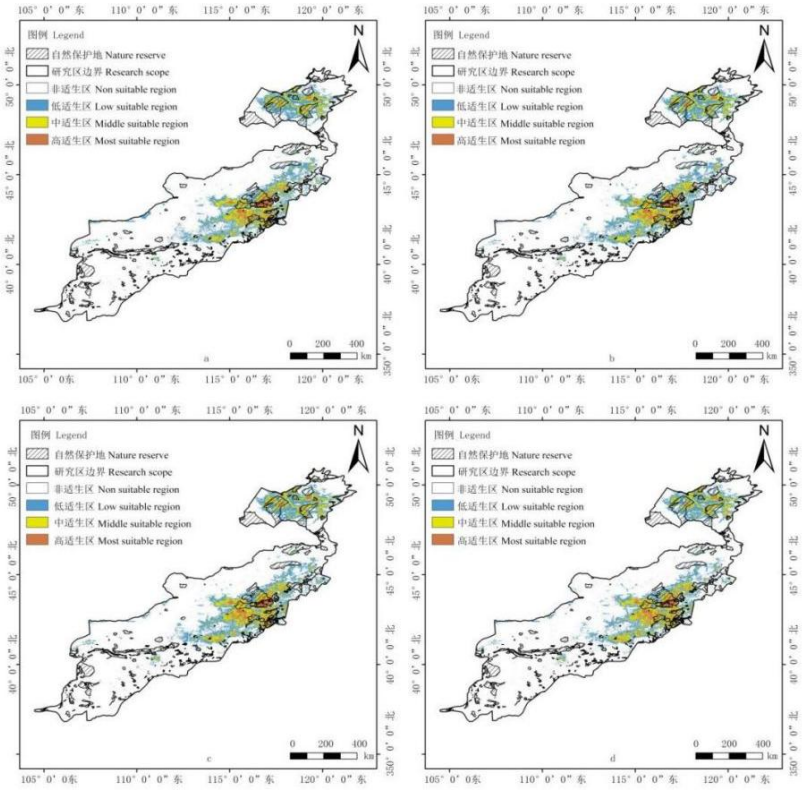

图 1. 不同气候情景下蓑羽鹤潜在繁殖地受保护现状

Figure 1. Protection status of potential breeding grounds for Demoiselle Cranes under different climate scenarios (a.当前气候情景；b.2050s SSP1-2.6 气候情景；c.2050s SSP3-7.0 气候情景；d.2050s SSP5-8.5 气候情景 a. Current climate; b. 2050s SSP1-2.6 climate scenario; c. 2050s SSP3-7.0 climate scenario; d. 2050s SSP5-8.5 Climate Scenario)

Evaluation and Protection Gap of Potential Breeding Sites for the Demoiselle Crane Under Climate Change

TU Yawen[1] SUN Xueying[2] TIAN Yiliu[3] XU Zhuo[4] DU Yanmei[5] DENG Wenyou[1] SONG Xilian[1] WU Qingming[1] ZOU Hongfei[1]

1 Northeast Forestry University, Harbin 150050

2 Mudanjiang Normal University, Mudanjiang 157011

3 Qiqihar Forestry and Grassland Station, Qiqihar 161000

4 Zhalong National Nature Reserve Management Bureau, Qiqihar 161000

5 Administration Bureau of Huihe National Nature Reserve, Hailar 021100

The Demoiselle Crane (*Anthropoides virgo*) has a global population estimated at approximately 170,000 – 220,000 individuals and is widely distributed across the Eurasian continent. China is one of the major breeding regions for this species, which is generally divided into eastern and western populations. The western population breeds mainly in northern Xinjiang (Bayanbulak), Qinghai, and Gansu; the eastern population breeds in Inner Mongolia—excluding the desert areas of Alxa League and the northern part of Bayannur—as well as in Heilongjiang and Jilin. In recent years, however, no Demoiselle Cranes breeding have been documented breeding in Heilongjiang and Jilin. Under these circumstances, assessing changes in the extent of potential breeding habitat and identifying conservation gaps in China—particularly in regions such as Heilongjiang and Jilin where breeding has not been recorded for many years—is crucial for providing scientific guidance to maintain the stability of breeding populations of the Demoiselle Crane. Such efforts are essential for the conservation of both existing breeding populations and their potential breeding habitats.

In this study from years 2023 to 2024, the eastern steppe subregion of China was selected as the research area to evaluate changes in the distribution of potential breeding habitats of the Demoiselle Cranes under different climate scenarios and to identify conservation gaps relative to current protected areas. The results indicate that: (1) mean annual temperature, annual precipitation, mean daily diurnal temperature range, and distance to water bodies are key environmental variables influencing the breeding habitat distribution of the species; (2) under the current climate scenario, highly suitable breeding habitat covers 15.42×10^3 km^2 (2.54% of the study area), of which 6.08×10^3 km^2 is protected, and the conservation proportion across all suitability classes remains below 60%; and (3) under future climate scenarios, the area of highly suitable habitat expands with increasing greenhouse gas emissions, whereas total suitable habitat decreases under high-emission scenarios. The proportion of protected habitat across suitability classes ranges from 17.0% to 39.6%, indicating substantial conservation gaps exist, which may continue to expand.

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长江中下游湖泊湿地群鹤类栖息地识别及网络构建与优化研究

王成[1] 董斌[2] 张紫涵[1,3]

1 安徽农业大学 经济管理学院，安徽 合肥 230036

2 安徽农业大学 资源与环境学院，安徽 合肥 230036

3 北京师范大学 环境学院，北京 100875

长江中下游湖泊湿地群位于安徽省西南部（106°42′E-117°42′E，29°30′N-31°50′N），面积约

28658.2km^2。作为东亚-澳大利西亚迁徙路线上重要的中转站，其分布有菜子湖、升金湖、武昌湖等数十个湖泊湿地，是长江中下游地区生态安全屏障的重要组成部分，具有重要的生态功能。因此，其栖息地识别及网络构建与优化研究对于明晰区域湖泊湿地群的生物多样性维护具有十分重要的价值。

本研究共收集 2000~2020 年长江中下游 5 期鹤类分布的 2562 个点位数据，共包括四种典型越冬鹤类：白鹤（*Grus leucogeranus*）、白头鹤（*Grus monacha*）、白枕鹤（*Grus vipio*）、灰鹤（*Grus grus*）。点位数据主要通过两种方式收集：（1）野外调查：2020 年采用样点法、样线法对越冬候鸟进行观察计数。（2）其他年份数据主要采用文献整理、中国观鸟记录中心网站等线上平台数据检索获得。结合周边环境因子，运用 Maxent 模型模拟鹤类栖息地分布，选择中高适生区作为栖息地源地，采用电路理论构建了长江中下游鹤类栖息地网络，运用图论法分析网络并提出优化措施，以下是主要的研究结果。

1. 鹤类栖息地时空变化特征

空间上，2000-2005 年潜在栖息地主要分布于龙感湖、升金湖上下游和菜子湖梅花大圩，2005-2020 年则主要分布于升金湖下游和菜子湖东侧。面积上，2000-2020 年鹤类适生区面积整体减少，中适生区减少了 6234.23 hm^2 ，高适生区减少了 786.41 hm^2 ，分别减少了 52.05%和 71.09%。

2. 鹤类栖息地网络时空变化特征

空间上，2000-2010 年廊道结构变得越来越简单，由方形稳固结构逐渐转为三角形简单结构。2010-2020 年仍保持三角形简单结构，网络内部逐渐变得简单。2000-2020 年重要廊道的分布范围主要在网络东南侧和菜子湖内部各湖体之间，由贯穿整个网络到逐渐集中于升金湖、菜子湖周围。整体来看，夹点主要分布于源地周围以及廊道交汇处，障碍点分布由网络内部向外部扩散，并且集中在每条廊道中部。

数量上，2000-2020 年廊道数量由 27 条变化到 14 条，减少 48.15%；重要廊道的比重由 44%下降到 29%；廊道总长度由 949.84 km 减少到 496.85 km，减少 47.69%，栖息地网络整体呈现收缩趋势。整体来看，2000-2020 年研究区夹点数量波动性下降，障碍点占廊道长度的比率由 0.041 变化到 0.064，上升了 56.10%，鹤类流动的阻碍性增强。

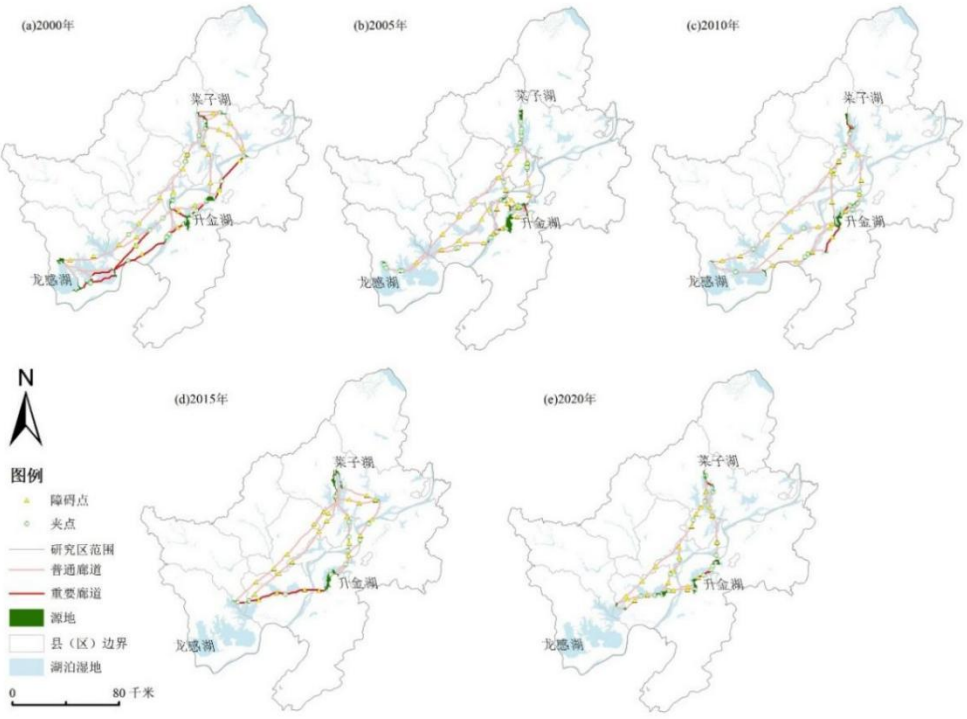

图 1. 长江中下游湖泊湿地群 2000-2020 年生态网络结果

Figure 1. Ecological corridors and network pinch/barrier points of crane habitats in the complex of lakes and wetlands in the middle and lower reaches of the Yangtze River from 2000 to 2020

3. 鹤类栖息地网络“一体化-差异化”协同管理策略

在对鹤类栖息地网络进行优化管控时，既要保证栖息地网络中源地的分布，又要重视夹点和障碍点的治理。因此，必须对栖息地网络相应地实施差异化空间控制，并制定有针对性的管理战略。基于此，我们提出了“一体化-差异化”协同管理策略。“一体化”侧重于空间管控，改善源地和廊道使得整体网络的连通性和复杂程度得到基本保证。“差异化”侧重于要素治理，结合夹点和障碍点综合考虑。

本研究有助于研究人员和管理者进一步认识长江中下游地区鹤类栖息地网络的变化规律和发展特征，可为长江中下游湖泊湿地群生态保护与可持续发展提供数据参考。

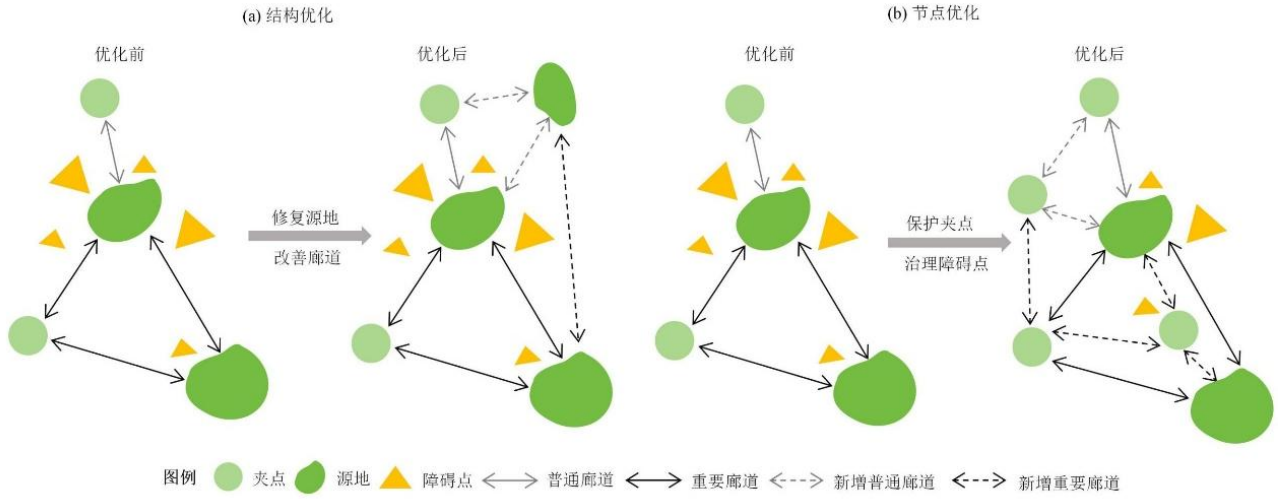

图 2. 鹤类栖息地网络结构优化前后对比概念图

Figure 2. Conceptual models of crane habitat network structure before and after optimization

Identification and Network Construction and Optimization of Crane Habitats in the Lake Wetlands of the Middle and Lower Reaches of the Yangtze River

WANG Cheng[1] DONG Bin[2] ZHANG Zihan[1,3]

1 College of Economics and Management, Anhui Agricultural University, Hefei 230036

2 College of Resources and Environment, Anhui Agricultural University, Hefei 230036

3 College of Environment, Beijing Normal University, Beijing 100875

A large number of lakes and wetlands in the middle and lower reaches of the Yangtze River are located in the southwest of Anhui Province (106°42′E-117°42′E，29°30′N-31°50′N), with an area of 28,658.2 km^2. As an important migratory stopover along the East Asian-Australasian Flyway, this region is characterized by dozens of lake wetlands including Caizi Lake, Shengjin Lake and Wuchang Lake. It is an important component of the ecological security barrier in the middle and lower reaches of the Yangtze River and has important ecological functions. Therefore, research on the identification, network construction and optimization of habitats is of great significance for clarifying the role of this regional lake wetland complex in maintaining its biodiversity.

This study collected a total of 2,562 data points on crane distribution in the middle and lower reaches of the Yangtze River from 2000 to 2020, including 4 common overwintering crane species: Siberian Crane (*Grus leucogeranus*), Hooded Crane (*Grus monacha*), White-naped Crane (*Grus vipio*), and Common Crane (*Grus grus*). The point data were mainly collected through two methods: (1) a field survey was conducted in 2020 by using point-count and line-transect methods to observe and count overwintering migratory birds. (2)

secondary data were obtained for the other years through literature reviews and data retrieval from online platforms such as the China Bird Report. Combining with the surrounding environmental factors, MaxEnt model was used to simulate the distribution of crane habitat, and the medium and high fitness area was selected as the habitat source. The circuit theory was used to construct the crane habitat network in the middle and lower reaches of the Yangtze River. Graph theory methods were then employed to analyze this network and propose optimization strategies. The following are the main research results.

1. Temporal and spatial variation characteristics of crane habitats

Spatially, from 2000 to 2005, potential habitats were mainly distributed in Longgan Lake, the upstream and downstream of Shengjin Lake and the Meihua Dawei of Caizi Lake. From 2005 to 2020, they were mainly distributed in the downstream section of Shengjin Lake and the eastern side of Caizi Lake. In terms of area, the total suitable habitat for cranes decreased overall from 2000 to 2020. The moderately suitable habitat area was reduced by 6,234.23 ha, while the highly suitable habitat area decreased by 786.41ha, decreasing by 52.05% and 71.09% respectively.

2. Temporal and spatial variation characteristics of crane habitat networks

Spatially, from 2000 to 2010, the corridor structure became increasingly simplified, gradually shifting from a stable rectangular structure to a simpler triangular form. From 2010 to 2020, the triangle structure remained simple, while the internal network continued to simplify. From 2000 to 2020, the distribution of important corridors was mainly concentrated in the southeast of the network and among the lake units within Caizi Lake. These corridors evolved from spanning the entire network to gradually becoming concentrated around Shengjin Lake and Caizi Lake. Overall, pinch points were mainly distributed around source areas and at corridor intersections. The barrier points are distributed from the inside of the network to the outside and concentrated in the middle of each corridor.

Quantitatively, from 2000 to 2020, the number of corridors decreased from 27 to 14, a reduction of 48.15%. The proportion of important corridors dropped from 44% to 29%, and the total corridor length shrank from 949.84 km to 496.85 km, a reduction of 47.69%. The habitat network exhibited a clear contraction trend. Overall, from 2000 to 2020, the number of pinch points in the research area fluctuated but showed a general decline; the ratio of barrier points to total corridor length increased from 0.041 to 0.064, a rise of 56.10%, indicating enhanced resistance to crane movement.

3. “Integration-Differentiation” coordinated management strategy of crane habitat network

When optimizing and managing the crane habitat network, it is essential to both preserve the distribution of source areas within the network and prioritize the management of pinch points and barrier points. Therefore, it is imperative to implement differentiated spatial controls and develop targeted management strategies for the habitat network. Based on this, we propose an “Integration-differentiation” coordinated management strategy. The “Integration” focused on space management and control, aiming to secure the complexity of the overall network. The “Differentiation” focuses on element management, taking into comprehensive consideration both pinch points and barrier points.

This study contributes to further understanding of the changes and developmental characteristics of crane habitat networks in the middle and lower reaches of the Yangtze River. It can also provide data references for ecological conservation and sustainable development of the lake wetland complexes in this region.

基于 MSPA 和 MCR 模型的皖江流域重要湿地的生态网络构建

高祥[1] 董斌[1] 芮行聪[2]
1 安徽农业大学 资源与环境学院，安徽 合肥 230036
2 安徽农业大学 林学与园林学院，安徽 合肥 230036

皖江流域是长江流域的重要组成部分，是安徽中南部重要的生态涵养区，拥有安徽省最大的湿地保护区和最多的自然保护区。其所涵盖的自然保护区类型多，生物种类多，覆盖多个行政区划。作为长江经济带的重要组成部分，其湿地生态系统在维护区域生态平衡、提供生物栖息地、调节气候和水文循环等方面发挥着不可替代的作用。

本研究以皖江流域为研究区域，通过形态学空间格局分析法（morphological spatial pattern analysis，MSPA）解析并选取高生态价值区域作为核心区；运用景观连通性评价法对核心区生态源地连通性排序，确定连通性最高的为生态源地；选取与生态源地重叠的湿地、自然保护区作为湿地源地；提取影响物种迁徙的 6 个阻力因子，通过最小累积阻力（Minimum Cumulative Resistance, MCR）模型和重力模型模拟生态廊道，构建皖江流域重要湿地生态网络，以下是主要的研究结果。

1. 基于 MSPA 的景观格局分析

基于 MSPA 方法， 我们把这一区域分为 7 种景观类型：核心区、支线、连接桥、边缘区、环岛、孤岛和空隙。研究区域内核心区的占比最大，为 21,936 km^2，占生态面积空间的 84.38%，占研究区域的 30%。核心区分布南北差异大，主要集中在研究区域的中部、南部，南部主要为安庆市、池州市、宣城市的森林、灌木等地，中部则分布在长江流域的沿江湿地以及合肥市巢湖及其周围的湿地自然保护区附近，生态斑块面积大，聚集性强；北部区域的核心区相较于中南部较稀疏，分布在最北部的明光女山湖自然保护区以及部分中小型森林周围，单块面积小，破碎程度较高，不利于物种的迁移和扩散。其余 6 种景观类型占比均较小，共占生态面积空间的 15.62%，占研究区域的 6.01%。

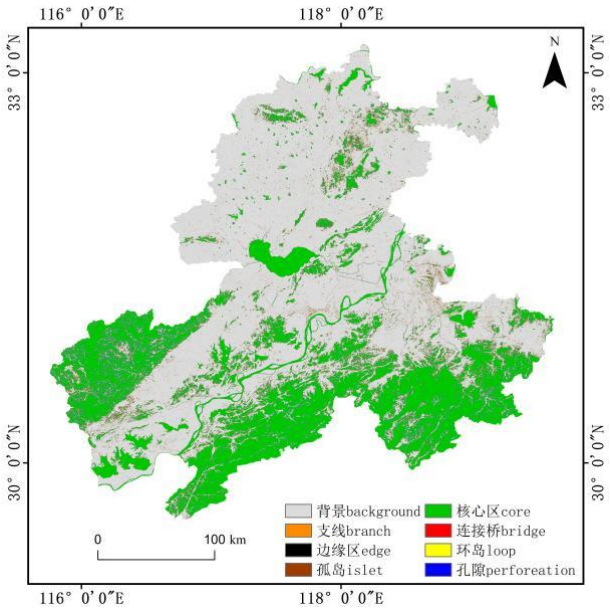

图 1. 皖江流域 MSPA 景观分类图
Figure 1. MSPA landscape classification map of Wanjiang River Basin

2. 生态源地的筛选及分布特征

在 MSPA 得出的景观类型中，核心区是大型的自然斑块，大多作为野生动物栖息地、自然保护区等，具有极高的生态价值，斑块面积越大，则更加有利于物种生存、迁移和扩散，本研究采用面积阈值法筛选潜在生态源地，将斑块面积不小于 20 km^2 作为基本遴选标准，并据此进行重要性分级。

运用 Conefor 2.6 景观分析软件对潜在生态源地斑块进行重要性评估，通过移除斑块对维持景观连

通性的重要程度（dPC）进行排序分级，选取 dPC > 1 的 14 个斑块作为生态源地。最后选取与生态源地重叠的皖江流域湿地、自然保护区作为湿地生态源地并按顺序进行排列，最终得到湿地生态源地 12 个，总面积达 2,912.25 km^2，集中在皖江流域中部和西南部。

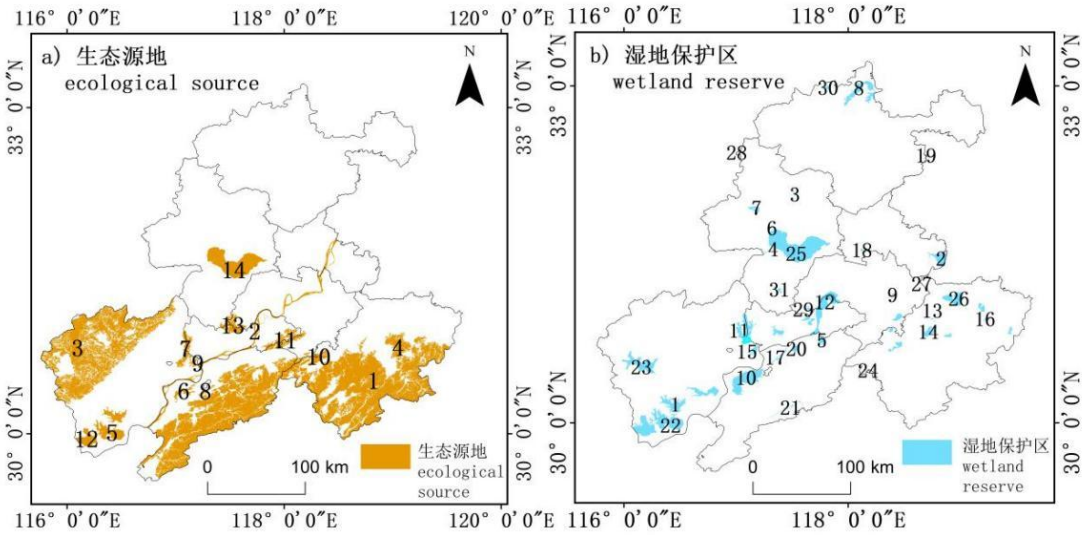

图 2. 皖江流域湿地保护区和生态源地位置对比图

Figure 2. Location comparison of wetland reserves (right) and ecological sources (left) in Wanjiang River Basin

3. 皖江流域湿地生态网络分布特征

皖江流域内共提取了 66 条生态廊道，总长达 7,242.73 km，其中一级生态廊道 19 条，长达 2,164.71 km；二级生态廊道 47 条，长达 5,078.02 km，生态廊道的分布极其不均衡，主要分布在研究区中部和西南部，包括合肥市、安庆市、池州市、芜湖市以及宣城市，且都聚集在中大型湖泊及长江流域。

节点共 72 个，其中一级节点 32 个、二级节点 40 个。一级生态节点主要集中在安徽安庆沿江湿地省级自然保护区、安徽升金湖国家级自然保护区（简称升金湖保护区）、安徽铜陵淡水豚国家级自然保护区和巢湖湿地附近；二级生态节点的分布较一级生态节点分散，主要分布在太湖花亭湖国家湿地公园、升金湖保护区附近。

本研究为皖江流域当前的生态状况进行了较为全面的评估，有助于皖江流域生态保护与候鸟生境保护提供科学依据。

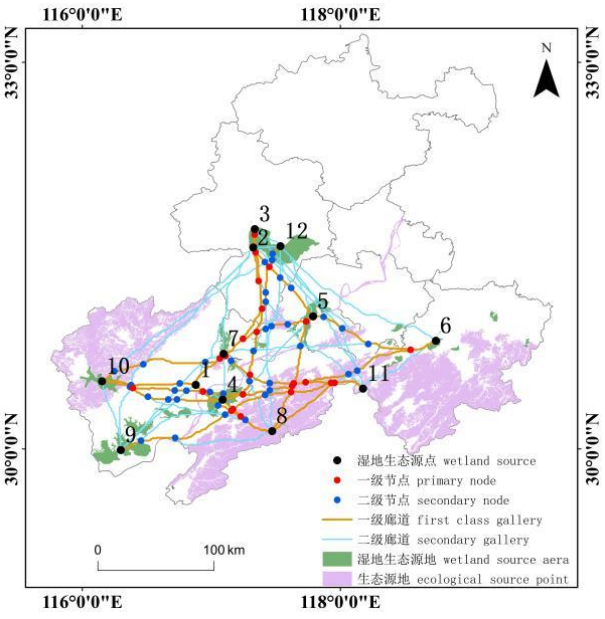

图 3. 皖江流域生态网络

Figure 3. Ecological network of Wanjiang River Basin

Construction of Ecological Network for Key Wetlands in the Wanjiang River Basin Based on MSPA and MCR Models

GAO Xiang[1] DONG Bin[1] RUI Xingcong[2]
1 College of Resources and Environment, Anhui Agricultural University, Hefei 230036
2 College of Forestry and Landscape Architecture, Anhui Agricultural University, Hefei 230036

The Wanjiang River Basin is an important component of the Yangtze River Basin and serves as a significant ecological conservation area in the central and southern Anhui Province. It encompasses the largest wetland reserve and the highest number of nature reserves in Anhui. The region features diverse types of nature reserves, abundant biological diversity and spans multiple administrative divisions. As a key part of the Yangtze River Economic Belt, its wetland ecosystem plays an irreplaceable role in maintaining regional ecological balance, providing habitats for wildlife, and regulating climate and hydrological cycles.

This study focuses on the Wanjiang River Basin as the research area and employs the morphological spatial pattern analysis (MSPA) to analyze and select areas with high ecological value as core areas. The landscape connectivity evaluation method was applied to rank the connectivity of these core areas, with the most connected areas designated as ecological sources. Wetlands and nature reserves overlapping with these ecological sources were identified as wetland sources. Six resistance factors affecting species migration were extracted to simulate the ecological corridors and construct an important wetland ecological network for the Wanjiang River Basin through the Minimum Cumulative Resistance (MCR) and gravity model. The following are the main research results.

1. Landscape pattern analysis based on MSPA

There are 7 types of landscapes based on MSPA method: core, branch, bridge, edge, loop, islet and perforation. Core areas account for the largest proportion within the study region, covering 21,936 km², which accounts for 84.38% of the ecological area and 30% of the study area. The distribution of the core areas shows significant variation between the north and south, mainly concentrated in the central and southern study area. In the south, core areas are mainly located in forests and shrublands of Anqing, Chizhou and Xuancheng, while in the central region, they are distributed along the wetlands of the Yangtze River Basin and near the Chaohu wetland nature reserve in Hefei, with large ecological patches and high density. Comparing with the central and southern regions, core areas in the northern region distributed around the Mingguang Nvshanhu Nature Reserve in the northernmost region and some small to medium-sized forests, are smaller in size and highly fragmented, unfavorable for species migration and dispersal. The other 6 landscape types account for a small proportion, representing only 15.62% of the ecological area and 6.01% of the study area.

2. Screening and distribution characteristics of ecological sources

Among the landscape types identified through MSPA, core areas are largely natural patches, mostly as wildlife habitats and nature reserves, etc., with high ecological value. The larger the patch area, the more conducive to the survival, migration and dispersal of wildlife. This study adopted the area threshold method to screen potential ecological sources, setting a minimum patch area of 20 km^2 and classifying the importance based on this standard.

Conefor 2.6 landscape analysis software was employed to evaluate the importance of potential ecological source patches. The importance of maintaining landscape connectivity (dPC) was ranked by

removing patches, and 14 patches with dPC>1 were selected as ecological source areas. Finally, wetlands and nature reserves within the Wanjiang River Basin that overlap with these ecological sources were identified as wetland ecological sources and sequentially ranked. This process ultimately identified 12 wetland ecological sources, with a total area of 2,912.25 km^2, concentrated in the central and southwestern regions of the Wanjiang River Basin.

3. Distribution characteristics of Wanjiang River Basin wetland ecological network

A total of 66 ecological corridors were extracted within the Wanjiang River Basin, with a total length of 7,242.73 km. Among these, 19 are primary ecological corridors, spanning 2,164.71 km, and 47 are secondary ecological corridors, spanning 5,078.02 km. The distribution of these ecological corridors is highly uneven, primarily concentrated in the central and southwestern parts of the study area, including Hefei, Anqing, Chizhou, Wuhu and Xuancheng. These corridors are predominantly clustered around medium to large lakes and the Yangtze River Basin.

There are 72 nodes in total, including 32 primary nodes and 40 secondary nodes. The primary ecological nodes are predominantly concentrated near the Anhui Anqing Yangtze River Wetland Provincial Nature Reserve, Anhui Shengjinhu National Nature Reserve, Anhui Tongling Freshwater Dolphin National Nature Reserve and the Chaohu Wetland. In contrast, the distribution of secondary ecological nodes is more dispersed compared to the primary nodes, mainly located around the Taihu Huatinghu National Wetland Park and the Anhui Shengjinhu National Nature Reserve.

This study, with a relatively comprehensive assessment of the current ecological status of the Wanjiang River Basin, provides a scientific basis for ecological conservation and the protection of migratory bird habitats in this region.

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基于生态足迹的辉河保护区鹤类繁殖栖息地环境承载判别分析

马悦[1] 郭瑞萍[1] 宋曦濂[1] 吴志坚[2] 杜艳梅[2] 沃强[2] 吴庆明[1] 邹红菲[1]
1 东北林业大学，黑龙江 哈尔滨 150040
2 内蒙古辉河国家级自然保护区管理局，内蒙古 海拉尔 021100

繁殖期是野生动物种群得以延续的重要时期，内蒙古辉河国家级自然保护区（简称辉河保护区）是鹤类重要的繁殖地之一。辉河保护区内，分布有草原居民，当人鹤同域共存时，会在资源利用方面发生时空重叠，甚至产生资源利用方面的程度不等的冲突，不仅体现在保护区社区整体经济层面的水利、交通等利民工程，也会涉及部分居民日常生产生活层面的游牧活动，这些均会对保护区内草地、湿地等生态系统产生一定程度的扰动，进而间接导致保护区的生态系统质量与功能的动态变化，而这些恰恰是丹顶鹤、白枕鹤乃至灰鹤等大型濒危旗舰鸟种繁殖栖息所需要的重要因素，这些同域共存现象更会进一步扰动保护区对鹤类及其栖息地资源的科学管护。目前，辉河保护区鹤类栖息地需求方面的研究尚未被关注。为判别辉河保护区对繁殖鹤（丹顶鹤、白枕鹤、灰鹤）的环境承载，本文基于 2018-2022 年遥感影像、2021-2022 年繁殖期野外实地调查、统计年鉴等数据结合生态足迹法、景观格局指数、MaxEnt 模型等方法，以辉河保护区区内居民和繁殖鹤类作为研究对象，分析了保护区生态承载力的年度变化及景观格局动态、预测了繁殖鹤的适宜栖息地及其环境承载。

结果表明：研究期间，辉河保护区内，（1）土地利用类型变化呈平稳趋势，草地及芦苇沼泽一直是主要景观类型；6 种斑块形状特征较为简单；景观多样性和均匀度变化不大，整体的连通度没有增强；（2）年均生态足迹供给约为 33.52 ha/人，年均生态足迹需求约为 5.92 ha/人，生态足迹环境承载

力均呈盈余状态，年均盈余 27.60 ha/人；（3）2021 年及 2022 年繁殖鹤的适宜栖息地总面积分别为 7806.63 ha 和 14895.31 ha，主要分布在高林温多尔核心区和实验区内的巴彦塔拉达斡尔民族乡；（4）保护区为保护生物多样性预留的 12%的芦苇沼泽面积、芦苇沼泽的环境承载力盈余面积、繁殖鹤适宜栖息地预测需求均满足实际繁殖鹤的栖息地需求，至少能容纳丹顶鹤、白枕鹤、灰鹤均为 27～52 对。

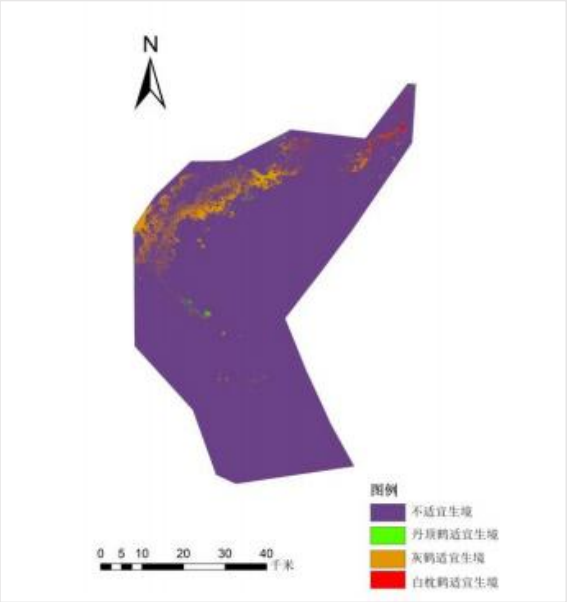

图 1. 2022 年三种繁殖鹤栖息地适宜性分布
Figure 1. Breeding habitat suitability distribution of three crane species at Huihe Nature Reserve in 2022

Discriminant Analysis of Environmental Carrying Capacity in Crane Breeding Habitat Based on Ecological Footprint in Huihe Nature Reserve

MA Yue[1] GUO Ruiping[1] SONG Xilian[1] WU Zhijian[2] DU Yanmei[2] WO Qiang[2] WU Qingming[1] ZOU Hongfei[1]
1 Northeast Forestry University, Harbin 150040
2 Administration Bureau of Huihe National Nature Reserve, Hailar 021100

The breeding period is an important period for the continuation of wild animal populations, and the Huihe National Nature Reserve in Inner Mongolia, China (abbreviated as Huihe Nature Reserve) is also one of the important breeding grounds for cranes. Grassland residents still live within the reserve, and when humans and cranes coexist in the same area, temporal and spatial overlaps in resource use inevitably occur, sometimes leading to varying degrees of conflict. Such conflicts are reflected not only in community-level infrastructure projects—such as water conservancy and transportation development that benefit local residents—but also in the daily pastoral activities of some households. These activities impose varying levels of disturbance on grassland and wetland ecosystems within the reserve, indirectly driving dynamic changes in ecosystem quality and function. These ecological attributes are essential for breeding habitat suitability for large, endangered flagship species such as the Red-crowned Crane, White-naped Crane, and even the Common Crane. The coexistence of humans and cranes further complicates the scientific management of crane populations and their habitat resources. At present, studies focusing on the habitat requirements of cranes in the Huihe Reserve remain scarce. To assess the reserve's environmental carrying capacity for breeding cranes, we used remote-sensing imagery from 2018–2022, field surveys conducted during the 2021–2022 breeding seasons, and statistical yearbook data, integrating the ecological footprint approach, landscape-pattern indices, and the MaxEnt model. Using both local residents and breeding cranes as focal subjects, we analyzed annual variation in ecological carrying capacity, examined landscape-pattern dynamics, and predicted suitable breeding habitat and its carrying capacity within Huihe Reserve.

The results show that during the study period within the Huihe Reserve: (1) Land-use types exhibited a stable trend, with grasslands and reed marshes consistently serving as the dominant landscape types. Patch-shape characteristics for the six major landscape categories remained relatively simple. Landscape diversity and evenness showed little variation, and overall landscape connectivity did not increase. (2) The average annual ecological footprint supply was approximately 33.52 ha per capita, while the ecological footprint demand averaged about 5.92 ha per capita. The ecological footprint carrying capacity remained in surplus, with an average annual surplus of 27.60 ha per capita. (3) The predicted suitable habitat areas for breeding cranes in 2021 and 2022 were 7,806.63 ha and 14,895.31 ha, respectively, mainly distributed in the core area of Gaolin Wenduer and in the Bayantala Daur Ethnic Township located in the experimental zone. (4) The 12% reed-marsh area reserved for biodiversity conservation in the Huihe Reserve, together with the surplus environmental carrying capacity of reed marshlands and the predicted habitat requirements for breeding cranes, all met the actual habitat needs of breeding crane populations. Calculations indicate that, under the condition that territories of the three crane species coexist and are spatially adjacent, the reed-marsh–based ecological carrying capacity can support at least 27 to 52 breeding pairs of Red-crowned Cranes, White-naped Cranes, and Common Cranes each.

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扎龙保护区灰鹤秋迁期农田生境利用及环境容纳量分析

孙雪莹[1] 张琦[1] 徐卓[2] 宋曦濂[1] 铁芬琴[1] 李浙[1] 沙力瓦·拍依祖拉木[1] 邓文攸[1] 陈露[1] 李祎斌[1]
吴庆明[1] 邹红菲[1]
1 东北林业大学，黑龙江 哈尔滨 150040
2 黑龙江扎龙国家级自然保护区管理局，黑龙江 齐齐哈尔 161000

灰鹤（*Grus grus*）为中国国家二级重点保护动物，其全球种群数量庞大，分布广泛，受关注度不高。黑龙江扎龙国家级自然保护区（简称扎龙保护区）是灰鹤的主要迁徙停歇区。每年春秋两季灰鹤均来此停歇，秋季数量远大于春季数量，2011~2019 年的情况一直如此。灰鹤主要利用扎龙保护区的农田，这些农田既是灰鹤停歇补充体能的主要区域，也是当地居民的主要经济来源区。每年春季，农民为了防虫而掺拌农药的玉米种子很容易成为灰鹤的安全隐患；灰鹤啄食玉米种子，导致玉米无法完成生长周期，造成减产，这也给农民造成了经济损失。每年秋季，灰鹤迁来时恰恰是农民未收割或收割当季，收割前灰鹤取食玉米穗上玉米，而收割后的农田因大型收割机难以完整收割的特点而存有大量散落的玉米粒，这也是该季节灰鹤补充体能的主要食物源。对于灰鹤啄食玉米穗上玉米的现象，农民通常会通过设立稻草人（短期有效）或哄赶等简单且文明的方式进行驱赶。灰鹤所在的区域恰恰是保护区的边缘地带，这种靠近保护边界的区域所形成的灰鹤迁徙期的停歇栖息环境并不令人放心，急需密切关注。基于此，本文于 2018 年~2019 年聚焦灰鹤迁徙期栖息生境利用偏好、秋迁期觅食生境特征、秋迁期觅食生境适宜性评价、秋迁期日食物量摄取及环境容纳量预测，开展了系列研究。

结果表明：（1）不同年度、不同迁徙季节扎龙保护区灰鹤昼间偏好利用的首选生境为农田，其次是芦苇沼泽，草甸和水域偏好度最低；（2）针对秋迁期偏好觅食的农田生境，灰鹤表现出选择利用的特征，分别为可觅食性因素、有效食物因素、警戒干扰因素、逃逸因素、水因素；（3）灰鹤秋迁期最适宜的农田觅食面积为 89.0872ha（占保护区总面积的 0.0424%），主要分布在哈钦岗子、崔家店、龙头街、肯可、长沟、小榆树、黄牛场等区域；（4）秋迁期灰鹤家族群（2 成 1 幼）中每只个体日均食量远高于亚成体群（为亚成体群的 7.26 倍），秋迁期灰鹤最适宜觅食的农田可容纳灰鹤亚成体群 2853~4279 只或可容纳家族群 131~196 个家族（2 成 1 幼）393~588 只。基于分析结果，建议：通过科普宣传、损害赔偿、合理规划等方式提升居民与灰鹤之间的和谐。

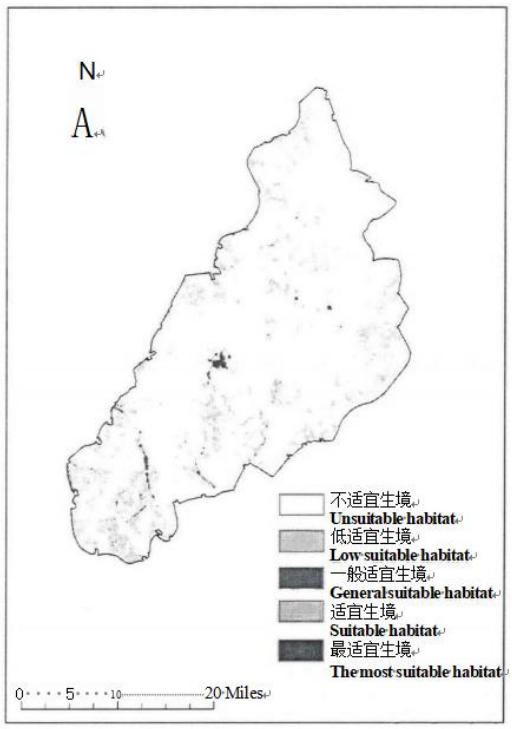

图 1. 灰鹤迁徙期适宜觅食区分布预测
Figure 1. Distribution prediction of Common Crane foraging habitat during migration in Zhalong Nature reserve

Farmland Habitat Utilization and Environmental Capacity of Common Crane During Autumn Migration Period in Zhalong Nature Reserve

SUN Xueying[1] ZHANG Qi[1] XU Zhuo[2] SONG Xilian[1] TIE Fenqin[1] LI Zhe[1] Shaliwa • PAIYIZULAMU[1]
DENG Wenyou[1] CHEN Lu[1] LI Yibin[1] WU Qingming[1] ZOU Hongfei[1]
1 Northeast Forestry University, Harbin 150040
2 Zhalong National Nature Reserve Management Bureau, Qiqihar 161000

The Common Crane is China's second-class key protected animal, and its global population is huge. Largely because its global population is large and its distribution is widespread, it does not receive as much attention. The Zhalong National Nature Reserve (referred to as Zhalong Reserve) in Heilongjiang Province, China, is a key migratory stopover for the Common Crane. Each year, the Common Cranes stop here during both the spring and autumn migrations, with autumn numbers significantly higher than those in spring. This pattern has been consistent from 2011 to 2019. The Common Cranes primarily utilize the farmland surrounding the Zhalong Reserve, which serves as both a crucial area for the birds to rest and replenish their energy and as the primary household income source for local residents. Every spring, farmers plant corn seeds mixed with pesticides to control pests, posing a poisoning risk to the Common Cranes. The cranes often forage on these seeds, which prevents the corn from completing its growth cycle and leads to reduced yields, resulting in economic losses for farmers. In autumn, when the Common Cranes migrate, the timing coincides with the harvest season, when the crops have either not been harvested or are in the process of being harvested. Before the harvest, the cranes feed on the ears of corn. To deter the cranes from pecking the corn, farmers often resort to simple methods such as setting up scarecrows (which are only temporarily effective) or chasing them away in a non-violent manner. After harvesting, large-sized harvesting machineries normally leave large amounts of scattered corn kernels on the ground. These leftover kernels serve as a major food source for the cranes during their migration. The areas where the Common Crane reside are located at the edge of the reserve, and the habitats formed in these regions during their migration period are concerning.

These stopover habitats near the reserve's boundary require urgent and close attention. Our study focuses on a series of investigations, including the Common Crane's habitat preference during the 2018–2019 migration, analysis of food source characteristics during the autumn migration period, suitability assessment of foraging habitats, daily food intake predictions during the autumn migration, and environmental carrying capacity forecasts.

Results of this study indicate that: (1) In different years and during different migratory seasons, the Common Cranes in the Zhalong Reserve preferentially utilize farmland during the day, followed by reed wetlands, while their preference for meadows and water bodies is the lowest. (2) Regarding the farmland habitat preferred for foraging during the autumn migration, the Common Cranes demonstrate specific selection characteristics, including factors such as food availability, effective food sources, disturbance risk, escape opportunities, and water factors. (3) The most suitable area for Common Cranes to forage in farmland during the autumn migration is 89.0872 ha (0.0424% of the total reserve area), primarily distributed in the regions of Hachingangzi, Cuijiadian, Longtoucun, Keke, Changgou, Xiaoyushu, Huangniuchang, and others. (4) During the autumn migration, the average daily food intake/bird in family groups (2 adults + 1 juvenile) is significantly higher than that of subadult groups (7.26 times greater than the subadult group). The most suitable farmland foraging area during the autumn migration at Zhalong is estimated to accommodate 2,853-4,279 subadult cranes or 393-588 family cranes (131-196 familys, with each family of 2 adults + 1 juvenile).

【鹤类监测】
[Crane Monitoring]

黑龙江友好保护区白头鹤种群现状

刘长峰
黑龙江友好国家级自然保护区管理局 黑龙江 伊春 153031

黑龙江友好国家级自然保护区（简称友好保护区）地处小兴安岭山脉中段，横跨小兴安岭山脉的南、北两坡，总面积60687 ha。保护区河漫滩平坦开阔，牛轭湖、热融湖众多，大小泡沼星罗棋布，土壤永冻层分布普遍，气候寒冷湿润，为各类沼泽的发育奠定了良好的环境基础，形成了森林沼泽、灌丛沼泽、草本沼泽、藓类沼泽等湿地类型，几乎囊括了小兴安岭林区所有湿地类型，其中由湖泊沼泽化形成的浮毯型毛果苔草－泥炭藓沼泽集中连片，与岛状分布的落叶松－杜香－泥炭藓沼泽等相间分布，构成大面积的沼泽湿地景观，具有北方山地沼泽湿地生态系统的典型特征。

友好保护区为白头鹤创造了优越的栖息环境。2021~2025年，友好保护区记录到白头鹤分别为21、22、56、62、58只。目前，保护区正计划开展白头鹤栖息资源的专项调查，以更加准确清晰地掌握白头鹤的栖息状况，为下一步开展白头鹤保护工作奠定基础。

图 1. 友好保护区的白头鹤
Figure 1. A family of Hooded Cranes in the Youhao Nature Reserve

图 2. 友好保护区生境
Figure 2. An aerial view of partial Youhao National Nature Reserve

Status of the Hooded Crane Population in Youhao National Nature Reserve, Heilongjiang Province

LIU Changfeng
Youhao National Nature Reserve, Yichun 153031

Youhao National Nature Reserve (referred to as "Youhao Reserve") is located in the midsection of the Lesser Khingan Mountains and spans both the southern and northern slopes of the mountain range. The reserve covers a total area of 60,687 hectares. Within the reserve, were are broad and open floodplains of rivers, numerous oxbow and thermokarst lakes and a network of ponds and small wetlands. With the cold and humid climate, permafrost is pervasive in the soils. All of the above has contributed the development of various marsh types. As a result, the reserve features extensive forest bogs, shrub bogs, herbaceous marshes and bryophyte-dominated mires, covering nearly all wetland types characteristic of the Lesser Khingan forest region. Particularly, there are large, contiguous areas of floating-mat *Sphagnum–Carex lasiocarpa* peat bogs formed by lacustrine swamping, which are interspersed with island-like patches of *Larix gmelinii-Ledum palustre-Sphagnum* peat bogs. Together, these wetland mosaics form an extensive peatland landscape that typifies montane northern peat-wetland ecosystems.

Touhao Reserve provides high-quality habitat for the Hooded Crane. Over the past five years, 21, 22, 56, 62 and 58 Hooded Cranes have been recorded in the reserve, respectively. The reserve is currently planning a targeted survey of Hooded Crane habitat resources in order to obtain a more accurate and detailed assessment of habitat use and population status; the results will provide a sound scientific basis for future Hooded Crane conservation efforts.

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白枕鹤西部种群闪电河流域停歇地调查的思考

内蒙古正蓝旗野生动物保护协会 内蒙古 锡林郭勒盟 026000

白枕鹤西部种群主要迁徙停歇地的调查监测是内蒙古正蓝旗野生动物保护协会的主要工作。

位于内蒙古锡林郭勒盟正蓝旗、多伦县和河北省沽源县的闪电河流域河谷是白枕鹤西部种群最主要的迁徙停歇地。每年春秋两季，白枕鹤西部种群在闪电河流域河谷停歇一个月左右（春季 3 月下旬至 4 月，秋季 9 月下旬至 11 月上旬），主要取食燕麦、莜麦、玉米等粮食作物。

正蓝旗和多伦县位于闪电河流域上游，湖泊较多。正蓝旗面积 1.02 万 km^2，多伦县 0.39 万 km^2；正蓝旗以牧业为主，多伦县以农业为主。两地常见的鹤类有：灰鹤、蓑羽鹤、白枕鹤，偶见丹顶鹤与白头鹤；其它迁徙鸟类以雁鸭类、鸻鹬类及鹭科为主，夏候鸟较多，冬候鸟可见少数猛禽。

白枕鹤春季停歇时间较短，每年 4 月中上旬是白枕鹤西部种群集中到达正蓝旗和多伦县的时期。正蓝旗和多伦县无霜期为 110 天，4 月份的平均高温为 9℃，低温-3℃，此时牧草尚未返青，农田还未开犁耕种，白枕鹤的主要食物是农田遗留的粮食或牧场的草籽。

图 1. 正蓝旗野生动物保护协会工作人员在监测鹤类
Figure 1. Staff of the Zhenglan Qi Wildlife Conservation Association monitoring crane species

Reflections from the Survey of Stopover Sites of the Western Population of the White-naped Crane in the Shandian River Basin

Zhenglan Qi Wildlife Conservation Association in Inner Mongolia, Xilin Gol League 026000

One of the primary tasks by the Inner Mongolia Zhenglan Qi Wildlife Conservation Association is to survey and monitor major stopover sites used by the western population of the White-naped Crane.

The Shandian River Valley, located across Zhenglan Qi and Duolun County of Xilingol League in Inner Mongolia, and Guyuan County in Hebei Province, is the most important migratory stopover site for the western population of the White-naped Crane. Each year during spring and autumn migration, these cranes stage in the valley for approximately one month (late March–April in spring, and late September–early November in autumn), feeding mainly on cultivated grains such as oats, naked oats, and corn.

Zhenglan Qi and Duolun County are situated in the upper reaches of the Shandian River basin, where wetlands and lakes are relatively abundant. The area of Zhenglan Qi is 10,200 km² and that of Duolun County is 3,900 km². Zhenglan Qi is predominantly pastoral, whereas Duolun County is mainly agricultural. The crane species commonly observed in both areas include the Common Crane, Demoiselle Crane, and White-naped Crane, with occasional sightings of the Red-crowned Crane and Hooded Crane. Other migratory birds recorded in the region are dominated by geese and ducks, shorebirds, and herons and egrets. Summer birds are relatively common, while a small number of raptors may be observed as winter visitors.

The spring stopover period of the White-naped Crane is relatively short. Early to mid-April marks the peak period when a large of the cranes from the western population congregates in Zhenglan Qi and Duolun County. The frost-free period in both areas is approximately 110 days. In April, average monthly high temperature is 9 °C, and monthly low temperature of -3 °C. At this time, pasture vegetation has not yet begun to regrow, and croplands remain untilled. Consequently, the primary food resources for the cranes consist of residual grains in farmlands or seeds remaining in grasslands.

内蒙古科尔沁保护区鹤类保护简况

杨淑慧
内蒙古科尔沁国家级自然保护区管理局，内蒙古 兴安盟 010020

内蒙古科尔沁国家级自然保护区（简称科尔沁保护区）地处内蒙古科尔沁右翼中旗，主要保护对象为科尔沁草原、榆杏疏林景观、鹤鹳类等珍禽及其栖息湿地。保护区依托“智慧监控系统+无人机巡护”构建了“水、陆、空”全天候监测网络。

1. 鸟类保护

2025年累计记录到鸟类13目23科68种140344只，其中白鹤22只、丹顶鹤17只、白枕鹤47只、东方白鹳197只、大鸨3只。观察到白尾海雕、白腹鹞、斑背潜鸭、东亚石鸻、极北柳莺、普通雨燕、凤头蜂鹰7种鸟类分布新记录。保护区鸟类名录达20目50科241种，其中国家一级保护鸟类17种、国家二级保护鸟类48种。

全年完成鸟类环志39种167只。2025年监测到东方白鹳20巢，成功繁殖幼雏58只。全年共救助鸟类及其他动物19种24只。全年上报疫源疫病监测数据212条，未发现高致病性禽流感疫情。

2. 栖息地修复

近年来，保护区实施河湖连通、河道疏浚等一系列生态修复工程，累计恢复与维持湿地面积17999.82 ha，湖泊数量从30个增至50余个，水域面积从五年前的554.8 ha扩大至3808.9 ha。

3. 宣传教育

2024年8月，科尔沁保护区建成自然教育中心并对外开放。保护区联合科右中旗各类学校、事业单位及周边社区居民，持续开展自然教育、科普宣传与环境教育培训等活动，累计接待参与者超过13000人次。

2025年春季候鸟迁徙季期间，科尔沁保护区与中央广播电视总台合作推出《神奇动物在这里》等2场主题直播，带领60余万观众“云端”探访候鸟迁飞通道；CCTV13《新闻直播间》栏目在秋季候鸟迁徙特别报道中对保护区进行专题报道。

此外，保护区抖音账号发布鹤类与水鸟相关短视频72条，开展东方白鹳繁育慢直播64场，累计吸引8629人关注，显著增强保护区社会影响力。

Overview of Crane Conservation at Keerqin National Nature Reserve, Inner Mongolia

YANG Shuhui
Inner Mongolia Keerqin National Nature Reserve Administration, Hinggan League 010020

The Inner Mongolia Keerqin National Nature Reserve (referred to as Horqin Reserve) is located in Horqin Right Wing Middle Banner, Inner Mongolia. The reserve's primary conservation targets include the Horqin grassland ecosystem, elm–apricot open woodlands, and rare birds such as cranes and storks, as well as their associated wetland habitats. By combining a “smart surveillance system + UAV patrols,” the reserve has established an all-weather, multi-dimensional monitoring network, covering water, land, and air of the reserve.

1. Bird Conservation

In 2025, the reserve recorded 140,344 individuals, belonging to 13 orders, 23 families, and 68 species, including 22 Siberian Cranes, 17 Red-crowned Cranes, 47 White-naped Cranes, 197 Oriental Storks, and 3 Great Bustards. Seven species were newly recorded in the reserve: White-tailed Eagle, Eastern Marsh Harrier, Falcated Duck, Stejneger's Stonechat, Arctic Warbler, Common Swift, and Crested Honey Buzzard. The reserve's updated bird checklist now includes 241 species belonging to 20 orders and 50 families, among

which 17 species are listed under China's Class I National Key Protected Wildlife and 48 species under Class II National Key Protected Wildlife.

Throughout the year, 167 individuals of 39 species were banded. In 2025, 20 Oriental Stork nests with 58 fledglings were recorded, which successfully produced . A total of 24 injured or distressed animals belonging to 19 species were rescued. Additionally, 212 sets of wildlife epidemic surveillance data were submitted, with no cases of highly pathogenic avian influenza detected.

2. Habitat Restoration

In recent years, the reserve has implemented a series of ecological restoration projects, including river–lake connectivity and river dredging. These efforts have restored or maintained 17,999.82 hectares of wetlands. The number of lakes has increased from 30 to more than 50, and the water surface area expanded from 554.8 hectares five years ago to 3,808.9 hectares.

3. Public Outreach and Education

In August 2024, the Horqin Reserve completed and opened its Nature Education Center. In collaboration with local schools, public institutions, and surrounding communities in Horqin Right Wing Middle Banner, the reserve has carried out nature education, science popularization, and environmental training activities, receiving over 13,000 visitations in total.

During the spring migration season of 2025, the Horqin Reserve collaborated with China Media Group to host two themed livestream programs, including "Amazing Animals Are Here", attracting more than 600,000 online viewers to virtually explore migratory bird flyways. In autumn, CCTV-13's "Live News" produced a special feature on the reserve as part of its coverage of migratory birds.

Additionally, the reserve's Douyin account has released 72 short videos related to cranes and waterbirds and has conducted 64 livestreams showcasing Oriental Stork breeding. These activities have attracted 8,629 followers, significantly enhancing the reserve's public visibility and conservation impact.

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辽河口保护区丹顶鹤种群监测

李玉祥 郭丽 高军 李凤丽 张兵 于常斌 王金爽 张勇
盘锦市林业和湿地保护服务中心，辽宁 盘锦 124010

1991年至今，辽宁辽河口国家级自然保护区（简称辽河口保护区）对丹顶鹤进了连续监测。

1. 丹顶鹤迁徙群体

1991~ 2025 年，辽河口保护区最早见到丹顶鹤的北迁时间是 1999 年 2 月 12 日，最晚离开的时间为 1999 年 12 月 21 日，但 2012 年有部分个体在盘锦越冬后，其最早迁来的时间和最晚迁离的时间则难以正确判断，只能通过集群情况进行判断。其迁徙高峰期为 3 月 10-20 日，3 月 25 日前基本全部迁离辽河口保护区（除繁殖种群外），停歇期不超过 20 天。

春季迁徙的最大种群数量为 2000 年的 808 只（3 月 21 日），2016 年最少，仅 125 只（3 月 12 日）；最大集群数量为 412 只，2000 年 3 月 13 日，在赵圈河管理站东侧苇田内记录。

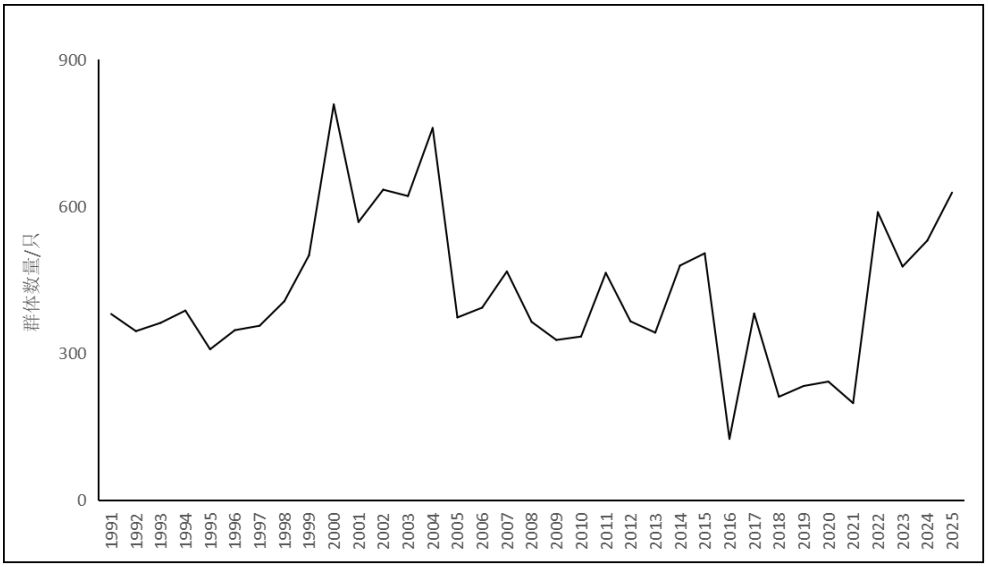

图 1. 辽河口保护区丹顶鹤迁徙群体动态

Figure 1. Numbers of Red-crowned Cranes during migration season in Liaohe Estuary Reserve

2. 丹顶鹤越冬群体

自 2010 年起，辽河口保护区成为野生丹顶鹤的越冬地，最初有 5 只丹顶鹤越冬，截止 2025 年初，越冬种群数量增加到 187 只，已成为丹顶鹤大陆群体的第三大越冬地，并且其越冬种群数量和规模仍在增加。越冬丹顶鹤种群主要栖息于辽河三角洲的农田区域与辽河口保护区丹顶鹤繁育基地附近，也靠近辽河入海口处，经常与白头鹤、白枕鹤、灰鹤等混群活动，取食收割后遗落的水稻。通常情况下，鹤群上午在稻田地觅食，下午到入海口处未封冻的海域休息或觅食，晚间多在鹤类繁育基地的苇田空旷处过夜。

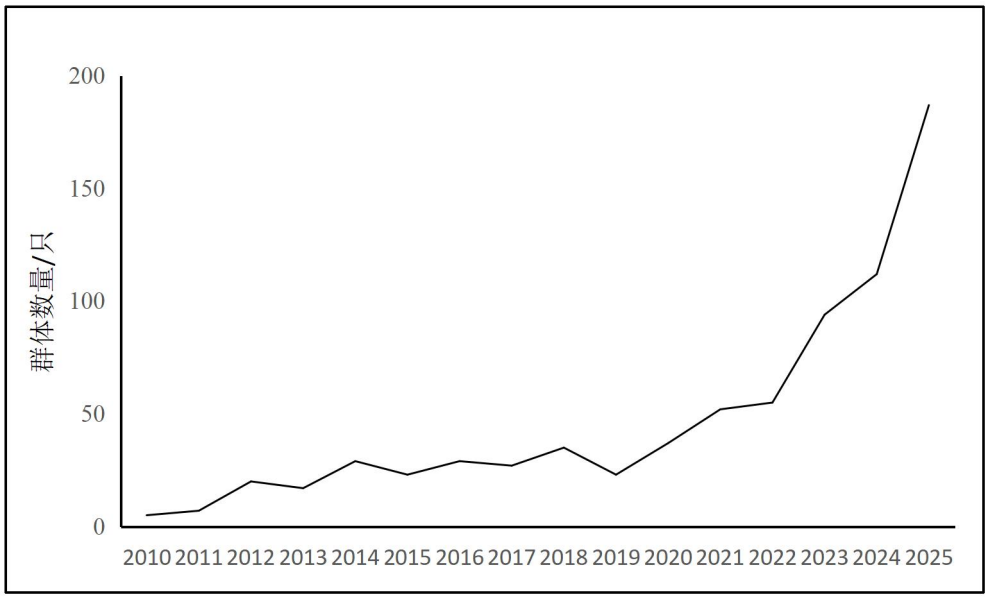

图 2. 辽河口保护区越冬动丹顶鹤群体数量

Figure 2. Wintering population of Red-crowned Cranes in Liaohe Estuary Reserve

3. 丹顶鹤越冬的环志个体

辽河口越冬的丹顶鹤主要来自于扎龙保护区和俄罗斯远东地区繁殖的种群，2025 年越冬季共记录到 12 只带有彩色环志的丹顶鹤（图 3），其中 3 只来自于俄罗斯、1 只来自大庆市、1 只来自于向海保护区、7 只来自扎龙保护区。

图 3. 2024-2025 年冬辽河口保护区有环志的丹顶鹤

Figure 3. Some Red-crowned Cranes with color bands and/or other tracking devices in the Liaohe Estuary Reserve during winter 2024-2025

Population Monitoring of Red-crowned Cranes at Liaohe Estuary National Nature Reserve

LI Yuxiang, GUO Li, GAO Jun, LI Fengli, ZHANG Bing, YU Changbin, WANG Jinshuang, ZHANG Yong
Panjin Forestry and Wetland Protection Service Center, Panjin City, Panjin 124010

Since 1991, the Liaohe Estuary National Nature Reserve (referred to as Liaohe Estuary Reserve) in Liaoning Province has conducted continuous monitoring of the Red-crowned Crane (*Grus japonensis*).

1. Migratory Population of Red-crowned Cranes

Over the 36-year period from 1991 to 2025, the earliest arrival of northward-migrating Red-crowned Cranes recorded in the reserve occurred on February 12, 1999, and the latest departure occurred on December 21, 1999. However, since several individuals began overwintering in Panjin in 2012, it has become quite difficult to determine the earliest and latest migration dates accurately, only to estimate these dates by observing congregation patterns. The peak migration period occurs between March 10 and 20, and by March 25, nearly all migrants (except the breeding population) have departed from the reserve. The stopover duration generally does not exceed 20 days. The largest spring migratory flock was recorded on March 21, 2000, totaling 808 individuals, whereas the lowest count occurred on March 12, 2016, with only 125 individuals. The largest single aggregation—412 cranes—was documented on March 13, 2000, in a reed field east of the Zhaoquan River Management Station.

2. Overwintering Population

Since 2010, the Liaohe Estuary Reserve has become a wintering site for wild Red-crowned Cranes. The initial overwintering group consisted of five individuals. By early 2025, the overwintering population had increased to 187 individuals, making the reserve the third-largest wintering site for the continental population of Red-crowned Cranes. The size of this wintering population continues to grow.

Overwintering cranes primarily inhabit agricultural landscapes in the Liaohe Delta and areas adjacent to the Red-crowned Crane Breeding Center within the reserve, close to the Liaohe River estuary. They frequently form mixed flocks with White-naped Cranes (*Grus vipio*), Hooded Cranes (*Grus monacha*), and Common Cranes (*Grus grus*), foraging mainly on post-harvest rice grains left in the fields. Typically, cranes forage in rice paddies during the morning, rest or feed in unfrozen coastal waters near the river mouth in the afternoon, and roost at night in open reed beds near the breeding center.

3. Color-banded Individuals Recorded During Winter

The Red-crowned Cranes overwintering at Liaohe Estuary mainly are from breeding populations in the Zhalong National Nature Reserve and the Russian Far East. During the 2025 wintering season, 12 color-banded individuals were recorded (Figure 3): three from Russia, one from Daqing City, one from the Xianghai National Nature Reserve, and seven from the Zhalong National Nature Reserve.

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黑龙江三环泡保护区鹤类现状

李宇[1] 查穆哈[2] 穆雪梅[2] 于佳贞[2] 王强[3] 于紫茵[1] 李云哲[1] 李万基[1]
1 黑龙江三环泡国家级自然保护区管理局，黑龙江 富锦 156100
2 东北林业大学，黑龙江 哈尔滨 150040
3 中国科学院东北地理与农业生态研究所，黑龙江 哈尔滨 150081

1. 保护区鹤类及栖息地基本情况

黑龙江三环泡国家级自然保护区（简称三环泡保护区）位于中国三江平原腹地，总面积 27687 ha，湿地类型以芦苇沼泽和苔草沼泽为主，是重要的候鸟停歇地和繁殖栖息地。

监测显示，三环泡保护区有 4 种鹤类，分别为丹顶鹤、白枕鹤、白头鹤和灰鹤；以白枕鹤和白头鹤群体数量为多，丹顶鹤数量较少，灰鹤偶见。从居留型来看，丹顶鹤、白枕鹤为夏候鸟，春秋迁徙季节数量较多，夏季数量减少；白头鹤和灰鹤为旅鸟，迁徙季节在保护区停歇。

多年来，保护区不断加强建设和管理，区内人为活动不断减少，为迁徙和繁殖鹤类栖息提供了有利条件。在黑龙江流域湿地保护网络支持下，保护区积极参与各项培训交流活动，巡护和管理能力得到显著提升，2024 年荣获黑龙江省候鸟巡护员职业技能大赛一等奖。

2. 三环泡保护区春季鹤类现状

三环泡保护区春季共有 4 种鹤类。其中，白头鹤群体数量一直占优势，数量在 47 只至 917 只之间。白枕鹤种群数量次之，群体数量在 29~925 只，2022 年后快速增长。丹顶鹤群体数量在 7~76 只；灰鹤偶见，仅 2014、2023、2024、2025 年有记录，数量在 1~3 只。

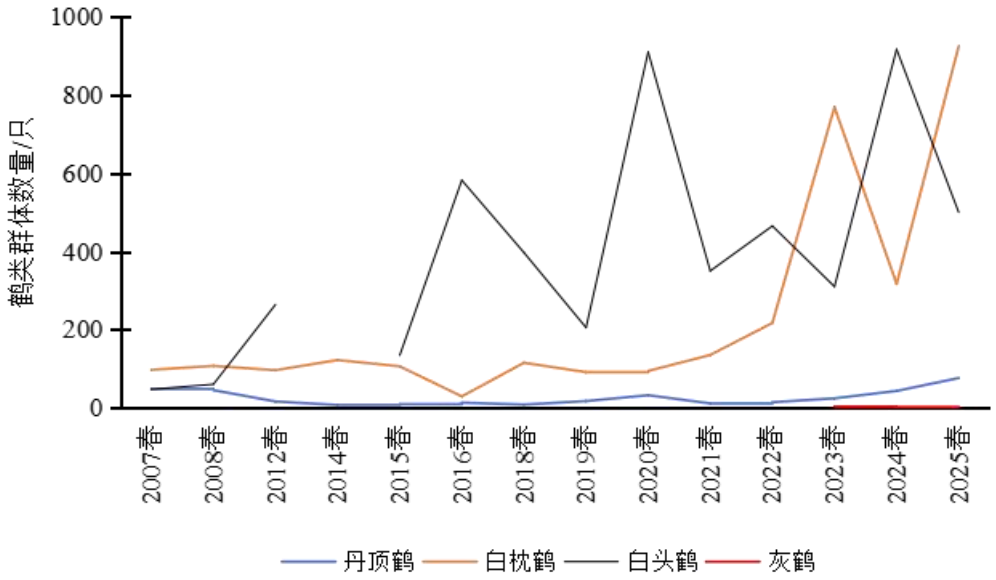

图 1. 三环泡保护区春季鹤类群体数量变化
Figure 1. Numbers of cranes during spring in Sanhuanpao Nature Reserve

3. 三环泡保护区繁殖鹤类现状

2025 年 5 月 13~14 日，三环泡保护区管理局、东北林业大学、中科院东北地理与农业生态研究所共同在三环泡保护区开展了鹤类繁殖调查，记录到丹顶鹤成鸟 73 只（27 巢/对、15 只雏鸟、4 枚卵），白枕鹤成鸟 49 只（20 巢/对、8 只雏鸟、3 枚卵）。与历史相比，三环泡保护区繁殖群体数量有新突破。

图 2. 三环泡保护区繁殖鹤类调查
Figure 2. Team members of investigating breeding cranes in Sanhuanpao Nature Reserve

Crane Status at Heilongjiang Sanhuanpao National Nature Reserve

LI Yu[1] ZHA Muha[2] MU Xuemei[2] YU Jiazhen[2] WANG Qiang[3] YU Ziyin[1] LI Yunzhe[1] LI Wanji[1]
1 Heilongjiang Sanhuanpao National Nature Reserve Administration, Fujin 156100
2 Northeast Forestry University, Harbin 150040
3 Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences, Harbin 150081

1. Basic information on cranes and habitats in the reserve

Heilongjiang Sanhuanpao National Nature Reserve, China (referred to as Sanhuanpao Nature Reserve) is located in the heartland of Sanjiang Plain, with a total area of 27,687 hm^2 and an important stopover and breeding site for migratory birds The wetland types are mainly reed marshes and sedge marshes.

Long-term monitoring data indicate the presence of 4 crane species in Sanhuanpao Nature Reserve: Red-crowned Crane, White-naped Crane, Hooded Crane, and Common Crane. Among them, White-naped Cranes and Hooded Cranes are the most numerous, while Red-crowned Cranes are less common, and Common Cranes are only occasionally observed. Both the Red-crowned Crane and White-naped Crane are summer residents. Their numbers are high during the spring and autumn migration seasons, but low in the summer. The Hooded Crane and Common Crane, however, are passage migrants that stopover in the reserve during migration.

Over the years, the reserve has continuously strengthened its infrastructure and management, leading to a steady reduction in human activities within its boundaries. It has created favorable conditions for cranes to rest during migration and breed locally. With the support of Wetland Protection Network of the Heilongjiang River Basin, the reserve has actively participated in various training and exchange programs. In 2024, it won the first prize in the Heilongjiang Provincial Migratory Bird Ranger Vocational Skills Competition.

2. Spring crane status at Sanhuanpao Nature Reserve

There are 4 crane species in Sanhuanpao Nature Reserve in spring. Among them, the Hooded Crane population has consistently been dominant, with numbers ranging between 47 and 917 individuals. The White-naped Crane population is the second most abundant, with counts varying between 29 and 925 individuals, showing rapid growth since 2022. The Red-crowned Crane population ranges from 7 to 76 individuals, while the Common Crane is only occasionally observed, with records solely in 2014, 2023, 2024, and 2025, and numbers between 1 and 3 individuals.

3. Breeding crane status at Sanhuanpao Nature Reserve

From May 13-14, 2025, a joint crane breeding survey was conducted in the Sanhuanpao Nature Reserve Administration, Northeast Forestry University, and Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences. The survey recorded 73 adult Red-crowned Cranes (including 27 breeding pairs and 19 none breeding adults. In addition, 15 fledglings and 4 eggs were recorded. 49 adult White-naped Cranes were recorded, including 20 breeding pairs and 9 none breeding adults. In addition, 8 fledglings and 3 eggs were recorded. Compared with historical data, the breeding population of cranes in Sanhuanpao Reserve has reached a new record high.

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黑龙江七星河保护区鹤类监测与保护

姜超
黑龙江宝清七星河国家级自然保护区管理局，黑龙江 双鸭山 155600

黑龙江七星河国家级自然保护区（简称七星河保护区）位于黑龙江省双鸭山市宝清县境内，是三江平原地区保存最原始、最典型的湿地生态系统之一。

目前，保护区记录到鸟类229种，其中国家一级保护鸟类9种，鹤类有3种，分别为丹顶鹤、白枕鹤、白头鹤。2020年至今，监测到的白枕鹤最大集群为60只，丹顶鹤最大集群为34只，白头鹤最大集群为6只。其中，繁殖丹顶鹤数量超过10对。

为有效保护湿地生态环境，保护区采取了一系列科学有效的保护措施：（1）加强生态监测网络建设，布设高清摄像头，对保护区重点区域全天候监测；（2）实施湿地生态修复工程，开展水系连通、植被恢复等工程，提升湿地生态系统健康；（3）加强巡护执法力度，严厉打击非法捕猎、破坏湿地资源等违法行为；（4）开展科普宣传教育，举办鹭鸣星河、湿地科普讲座等活动，提高公众对湿地保护的认识和参与度。

Steward Illustrated by the Crane Numbers: Crane Monitoring and Conservation at Qixinghe National Nature Reserve, Heilongjiang

JIANG Chao
Qixinghe National Nature Reserve Administration, Shuangyashan 155600

The Qixinghe National Nature Reserve (referred to as Qixinghe Reserve) is located in Baoqing County, Shuangyashan City, Heilongjiang Province. It represents one of the most pristine and typical wetland ecosystems remaining in the Sanjiang Plain region.

To date, 229 bird species have been recorded in the reserve, including nine species listed under China's National Class I Key Protected Wildlife. Three crane species are found in the area: Red-crowned Crane, White-naped Crane, and Hooded Crane. Since 2020, the largest flocks of the crane species monitored in the reserve have been recorded as 60 White-naped Cranes, 34 Red-crowned Cranes, and 6 Hooded Cranes. Among them, the number of breeding Red-crowned Crane pairs has exceeded ten.

To effectively protect the wetland ecosystem, the reserve has implemented a suite of science-based conservation measures: (1) Strengthening the ecological monitoring network by installing high-definition cameras in key areas in the reserve; (2) Carrying out wetland ecological restoration projects, including hydrological reconnection and vegetation restoration, to improve overall ecosystem health; (3) Enhancing patrol and law-enforcement efforts to crack down on illegal hunting and activities that damage wetland resources; (4) Conducting public education and outreach activities, such as the "Heron Calls over the Star River", an exhibit of literature and arts and wetland-themed science lectures, to raise public awareness and participation in wetland conservation.

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黑龙江洪河保护区 2025 年鹤类监测

朱和平[1]　吴庆明[1]　朱宝光[2]
1 东北林业大学，黑龙江 哈尔滨 150040
2 黑龙江洪河国家级自然保护区管理局，黑龙江 建三江 156300

黑龙江洪河国家级自然保护区（简称洪河保护区）位于黑龙江省同江市和抚远市境内，是三江平原典型内陆湿地生态系统自然保护区，海拔在 51.5~54.5 m，保护区总面积 233.24 km^2。洪河保护区主要繁殖鹤类有丹顶鹤和白枕鹤。

2025 年 3~10 月共开展鹤类调查 31 次，共监测到白枕鹤、丹顶鹤、白头鹤三种。其中，丹顶鹤数量最多的是 9 月 136 只；白枕鹤是 10 月 816 只；白头鹤仅 9 月可见，为 15 只。

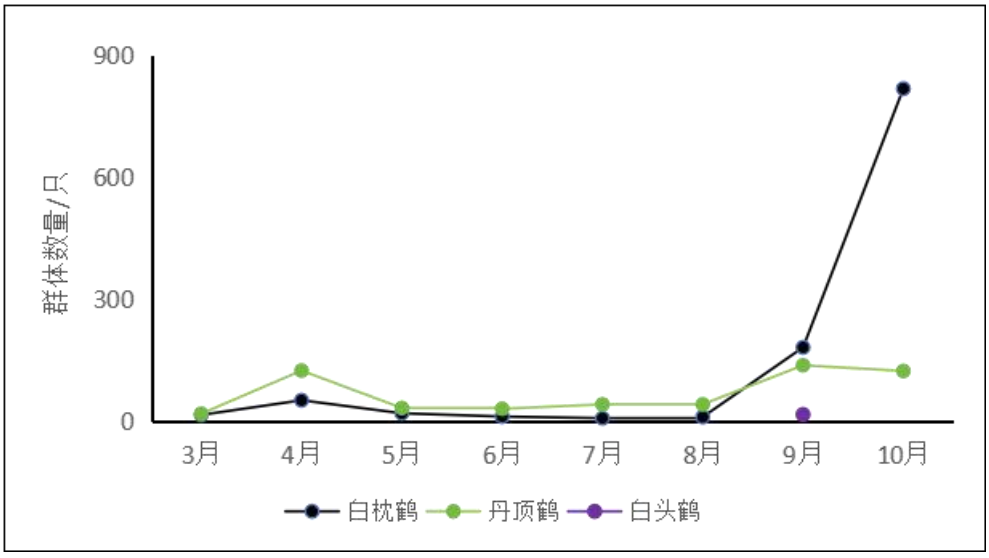

图 1. 洪河保护区 2025 年鹤类监测
Figure 1. Monitoring of crane species in Honghe Nature Reserve in 2025

2025 Crane Monitoring Survey at the Honghe National Nature Reserve, Heilongjiang

ZHU Heping[1] WU Qingming[1] ZHU Baoguang[2]
1 Northeast Forestry University, Harbin 150040
2 Heilongjiang Honghe National Nature Reserve Administration, Jiansanjiang 156300

The Honghe National Nature Reserve (referred to as Honghe Reserve), located in an area covered by both Tongjiang City and Fuyuan City in Heilongjiang Province, is a nature reserve representing the typical inland wetland ecosystem of the Sanjiang Plain. Its elevation ranges from 51.5 to 54.5 meters, and the total protected area covers 233.24 km². The main breeding crane species in the reserve are the Red-crowned Crane and the White-naped Crane.

From March to October 2025, a total of 31 crane surveys were conducted, during which three species were recorded: the White-naped Crane, the Red-crowned Crane, and the Hooded Crane. Among them, the maximum number of Red-crowned Cranes occurred in September, with 136 individuals; the maximum number of White-naped Cranes was in October, with 816 individuals; the Hooded Crane was observed only in September, with 15 individuals.

【黑颈鹤网络】
[Black-necked Crane Conservation Network]

四川若尔盖保护区 2025 年黑颈鹤数量监测简讯

索郎夺尔基 卓玛姐 纳么玖
四川若尔盖湿地国家级自然保护区管理局，四川 若尔盖 624599

四川若尔盖湿地国家级自然保护区（简称若尔盖保护区）作为黑颈鹤重要繁殖地之一，也是珍稀物种保护、生态系统修复、科研监测及保护理念实践的核心阵地。

为精准掌握若尔盖保护区黑颈鹤种群数量变化趋势，为保护黑颈鹤及栖息地提供基础支撑，保护区持续开展黑颈鹤种群数量监测。2025 年调查范围为 4 条样线 90 个样点，观察成鹤数量，同步纳入繁殖鹤类调查范畴。

调查显示，中线向东至嫩哇方向的 31 个点位监测到 67 只黑颈鹤；西北线红星至辖曼、唐克镇方向 22 个点位监测到 77 只；南线唐克至县城 19 个点位监测到 53 只；东西线若尔盖至花湖方向 18 个点位监测到 74 只。合计监测到 271 只黑颈鹤（不计幼鹤），包括领域鹤 213 只、群体鹤 58 只。另发现 10 只幼鹤及两处正孵化的巢穴。

此外，在保护区外侧观测到 25 只黑颈鹤，多为亚成体集群鹤。

图 1. 繁殖在若尔盖保护区的黑颈鹤（纳么玖 摄）
Figure 1. A Black-necked Crane breeding in Ruoergai Nature Reserve (Photo by Namojiu)

图 2. 河边沼泽区巢穴（纳么玖 摄）
Figure 2. A nest in the riverside marsh area (Photo by Namojiu)

图 3. 亚成体群鹤觅食（纳么玖 摄）
Figure 3. A flock of subadult cranes foraging in the grassland (Photo by Namojiu)

图 4. 调查工作图（纳么玖 摄）
Figure 4. Survey team working in the field (Photo by Namojiu)

Monitoring of Black-necked Cranes at Ruoergai Nature Reserve, Sichuan in 2025

SUOLANG Duoerji, Zhuomajie, Namojiu
Ruoergai Wetland National Nature Reserve Administration, Ruoergai 624599

Ruoergai Wetland National Nature Reserve, Sichuan (referred to as Ruoergai Nature Reserve), as one of the important breeding grounds for Black-necked Cranes, is also a crucial place for rare species protection, ecosystem restoration, scientific research and monitoring, and conservation practice.

In order to accurately determine the population trend of Black-necked Cranes and provide basic support for the protection of Black-necked Cranes and its habitat, Ruoergai Nature Reserve has been monitoring Black-necked Cranes. In 2025, the survey mainly recorded adult birds, covered 90 sample points on 4 transects, and recorded the cranes systematically.

There were 67 Black-necked Cranes recorded from the 31 points on Central Transect (from Xiangdong to Nenwa), 77 from the 22 points on Northwest Transect (from Hongxing to Xiaman and Tangke Town), 53 at from the 19 points on South Transect (from Tangke Town to Ruoergai Town), 74 from the 18 points on East-west Transect (from Ruoergai Town to Huahu). A total of 271 Black-necked Cranes (excluding chicks) were recorded, including 213 territorial cranes and 58 flock cranes. Furthermore, 10 chicks and 2 hatching nests were observed.

In addition, 25 Black-necked Cranes were observed outside the reserve, mostly subadult flock cranes.

甘肃盐池湾保护区 2025 年夏季黑颈鹤种群监测

色拥军
甘肃盐池湾国家级自然保护区管护中心，甘肃 盐池湾 736302

2025 年 7~9 月，甘肃盐池湾国家级自然保护区（简称盐池湾保护区）管护中心盐池湾保护站与北京林业大学生态与自然保护学院鹤类保护团队联合开展了黑颈鹤夏季种群监测任务。此次监测聚焦黑颈鹤的种群数量及其年龄组成。

本次监测共观察到黑颈鹤 275 只，其中成鸟 112 只、幼鸟 46 只、亚成体 117 只。该群体中，有 2 只幼鸟的家庭有 12 个，有 1 只幼鸟的家庭有 22 个。与 2024 年相比，黑颈鹤种群总量几乎持平，但今年调查时间比去年提前了约一个半月，后续亚成体数量仍有增加的可能。其中，黑颈鹤幼鸟数量约占总量的 16.73%，在高原湿地生态系统中反映出较强的繁殖适应与种群再生能力。

图 1. 盐池湾保护区的黑颈鹤（潘政伍 摄）
Figure 1. A family of Black-necked Cranes in Yanchiwan Nature Reserve (Photo by Pan Zhengwu)

Monitoring of Black-necked Cranes summering at Gansu Yanchiwan National Nature Reserve in 2025

SE Yongjun
Gansu Yanchiwan National Nature Reserve Administration, Yanchiwan 736302

From July to September 2025, the Gansu Yanchiwan National Nature Reserve (referred to as Yanchiwan Nature Reserve), in collaboration with a crane research group from the College of Ecology and Nature Conservation of Beijing Forestry University, conducted a summer population monitoring survey of Black-necked Cranes. This monitoring focused on their population size and age composition.

A total of 275 Black-necked Cranes were observed in this monitoring, including 112 adults, 46 fledglings and 117 sub-adults. Among the crane families, 12 had two fledglings each, while 22 had one

fledgling each. Compared to 2024, the total population of Black-necked Cranes remained almost unchanged; however, this year's survey was conducted approximately one and a half months earlier than last year, suggesting that the number of sub-adults may still increase in the future. The number of the fledglings accounted for approximately 16.73% of the total population, reflecting strong reproductive adaptation and population regeneration capacity of this species in the alpine wetland ecosystem.

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甘肃黄河首曲保护区黑颈鹤监测情况简报

张勇
甘肃黄河首曲国家级自然保护区管护中心，甘肃 甘南 747399

黑颈鹤是国家一级重点保护野生动物，也是黄河上游高寒湿地生态系统健康与否的重要指示物种，甘肃黄河首曲国家级自然保护区（简称黄河首曲保护区）便为其一个栖息地。为了精准掌握这一旗舰物种的生存状况，黄河首曲保护区于 2025 年 4~7 月对区内黑颈鹤种群及其栖息地进行了系统调查，并布设红外相机对 10 巢进行了繁殖监测，调查区域覆盖保护区内的齐哈玛、采日玛、曼日玛、河曲马场湿地等核心高寒沼泽湿地。监测发现：（1）3 月底至 4 月初，黑颈鹤飞至黄河首曲保护区，共记录到 319 只个体，集中分布于水源充沛、人为干扰少的区域；其中，齐哈玛湿地 46 只、河曲马场湿地 18 只、采日玛湿地 16 只。（2）10 巢中有 8 巢成功孵化出幼鹤，所有幼鹤均进入育雏阶段；两巢孵化失败，原因分别为卵被游荡的家犬取食、被野生藏狐取食，均发生在亲鸟离巢的短暂间隙。

建议对流浪犬或放牧活动的家犬进行管控。

图 1. 藏狐吃黑颈鹤卵
Figure 1. A Tibetan Fox eats Black-necked Crane's eggs

图 2. 家犬吃黑颈鹤卵
Figure 2. A domestic dog eats Black-necked Crane's eggs

Brief Report on Monitoring of Black-necked Crane in Gansu Yellow River Shouqu National Nature Reserve

ZHANG Yong
Gansu Yellow River Shouqu National Nature Reserve Administration, Gannan 747399

The Black-necked Crane is listed under China's National Class I Key Protected Wildlife, and an important indicator species for the health of the alpine wetland ecosystem in the upper reaches of the Yellow River. Gansu Yellow River Shouqu National Nature Reserve (referred to as Shouqu Nature Reserve) is one of its habitats. To accurately monitor the survival status of this flagship species, Shouqu Nature Reserve conducted a systematic survey of the Black-necked Crane population and their habitats from April to July 2025, and deployed infrared cameras to monitor their 10 nests. The survey area covered core alpine swamp wetlands within the reserve, including Qihama, Cairima, Manrima and Hequ Horse Farm Wetland.

The monitoring results showed that: (1) From late March to early April, Black-necked Cranes arrived at Shouqu Nature Reserve, with a total of 319 individuals recorded. These cranes moved mainly in areas with abundant water sources and minimal human disturbance. Among them, 46 individuals were observed in Qihama Wetland, 18 in Hequ Horse Farm Wetland, and 16 in Cairima Wetland. (2) Of the 10 monitored nests, eight successfully hatched and their chicks survived, while two nests failed due to egg predation, one by a free-roaming domestic dog and the other by a Tibetan Fox, with both incidents occurring when the parents were briefly away from the nests.

The predation of crane eggs suggests we strengthen the control of stray/domestic dogs in livestock grazing activities to ensure the breeding success of the Black-necked Cranes.

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甘肃盐池湾保护区环志的黑颈鹤配对成功

色拥军
甘肃盐池湾国家级自然保护区管护中心，甘肃 盐池湾 736302

2025 年 8 月 14 日，甘肃盐池湾国家级自然保护区（简称盐池湾保护区）管护中心工作人员色拥军，在党河国际重要湿地再次观测到佩戴红色 B07 腿环的黑颈鹤及其伴侣。这对黑颈鹤 7 月曾被观察到，它们在水域中对鸣、振翅、翩翩起舞。

B07 是 2020 年出生于盐池湾的黑颈鹤幼鸟，当年由管护中心与北京林业大学合作为其佩戴了腿环和跟踪器。时隔五年，2025 年首次记录到 B07 配对成功，并与伴侣一起活动，且拥有了较稳定的家域。2024 年监测时，B07 仍处于亚成体群中。

盐池湾保护区科研人员将持续对 B07 进行监测。

图 1-2 盐池湾保护区黑颈鹤（色拥军 摄）
Figures 1-2. Black-necked Cranes in Yanchiwan Nature Reserve (Photo by Se Yongjun)

A Black-necked Crane Ringed in Gansu Yanchiwan National Nature Reserve Successfully Paired

SE Yongjun
Gansu Yanchiwan National Nature Reserve Administration, Yanchiwan 736302

On August 14, 2025, Se Yongjun, a staff member of Gansu Yanchiwan National Nature Reserve Administration (referred to as Yanchiwan Nature Reserve), observed a Black-necked Crane with a red leg ring B07 and its mate in Danghe International Important Wetland at the reserve. This pair of Black-necked Cranes had been observed in July, they were calling to each other, flapping their wings and dancing in the water. Black-necked Crane B07 hatched in Yanchiwan in 2020, and was tagged with a color ring and a tracker by the reserve Administration and Beijing Forestry University the same year. B07 was recorded pairing

successfully up for the first time five years after. This pair has established a relatively stable home range during the observation.

B07 was first re-sighted after ringing in 2024 when it moved around among a flock of sub-adults.

Researchers at the Yanchiwan Nature Reserve will continue to monitor B07.

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云南会泽黑颈鹤保护区社区协同发展路径与发展模式

袁嵘 沈琴芬 崔桂美
云南会泽黑颈鹤国家级自然保护区管护局，云南 会泽 654200

云南会泽黑颈鹤国家级自然保护区（简称会泽保护区）地处乌蒙山腹地、长江上游牛栏江流域，是黑颈鹤的主要分布地，数量占全世界黑颈鹤总数的近 10%。然而，保护区内种植结构传统、单一，收入增长缓慢，保护与发展的矛盾曾十分尖锐。为了破解这一难题，保护区基于社区协同发展的角度在万亩基地、科普阵地、公益监测、三生空间等方面开展了创新尝试，构建了新发展理念下的“念湖样板”，现总结如下。

1. 发展绿色经济，建设万亩基地

保护区坚持生态产业化、产业生态化原则，遵循保护优先、绿色发展理念，依托资源优势，利用国家生态保护补偿资金，引导社区调整农业种植结构，建设马铃薯种薯、燕麦种子、高原无公害蔬菜、中药材四个万亩基地。通过引入专业农业企业，开展市场化运作，带动 2000 余户社区居民增收，2025 年产值预计可达 3.68 亿元。这一举措不仅为黑颈鹤提供了丰富的食物来源，还促进了乡村振兴，更实现了生态保护与经济发展的双赢。

图 1. 四个万亩基地
Figure 1. Four 10,000-mu bases

2. 开展自然教育，建立科普阵地

保护区依据国家林业和草原局关于开展自然教育的要求，先将科普知识引入社区和农家，以湿地保护为主题，将 21 户社区农家小院打造为科普阵地。然后引进专业自然教育机构，整合社区资源建设科普步道、观鸟台等自然教育设施，并建立利益联结机制，让社区居民参与自然教育服务。通过组织自然教学、体验和观察等活动，为社区居民增加收入 180 余万元，至 2025 年底预计可接待自然教育参与者 5000 余人次，这一举措提高了群众的保护意识，拓宽了生态产品价值转化路径。

图 2. 保护区“遇见湿地”自然教育启动仪式

Figure 2. Launching ceremony of “meeting wetlands” nature education in the reserve

3. 弥补公益科研，推动公益监测

为弥补科研监测力量不足，保护区开展了“公益科研、公益监测”的制度尝试，聘请国内有志于生态环保事业的人员作为公益科研监测员，2025 年度共聘请了 58 位来自云贵川冀皖黑的人员，经过专业培训、签订协议、持证上岗和严格考核等程序，使其参与到科研监测工作中。公益科研监测员利用熟悉当地环境的优势，首次发现了白头鹤、白肩雕、林麝等国家一级保护动物，记录了多种鸟类繁殖数据。这为保护区强化科研力量树立了典范。

图 3. 来自云贵川冀皖黑等 6 省的公益科研监测员

Figure 3. Public welfare scientific research monitors from 6 provinces

4. 创新管护机制，打造三生空间

按照生产、生活、生态“三生”空间布局，将保护区进行了新模式划分。（1）将村庄划为生活单元，投资建设污水截污及处理设施，对湿地流域进行综合治理，严格管控“两污”排放；（2）将农耕地划为生产单元，限制建设影响鸟类觅食的设施，规范化肥、农药使用，建立残膜回收机制；（3）将环黑颈鹤栖息湿地划为生态单元，禁止任何人进入。通过这种“单元管控、清单管理”的精细化管理方式，打造了念湖管护模式，既保障了社区居民正常生产生活，又实现了对黑颈鹤栖息地的精准保护。

经过多年实践，保护区保护成效十分明显。（1）五年来，鹤类数量从 860 只增加至 1647 只，鸟类种群数量从 181 种增加至 229 种，国家一级保护动物从 6 种增加至 9 种，二级保护动物从 17 种增加至 29 种，部分候鸟变为留鸟在念湖就地繁殖。（2）2024 年生态环境部开展的五年保护成效评估结果显示，生态环境质量等级为Ⅰ级，综合评定等级为“优”。（3）由“万亩基地、科普基地、公益监测、三生空间”构成的“念湖模式”实现了会泽保护区生态保护与经济发展的良性互动。

A Model of Community-based Conservation and Development ——A Case Study of Huize National Nature Reserve in Yunnan Province

YUAN Rong, SHEN Qinfen, CUI Guimei
Yunnan Huize Black-necked Crane National Nature Reserve Administration, Huize 654200

Yunnan Huize Black-necked Crane National Nature Reserve (referred to as Huize Nature Reserve) is located in the hinterland of Wumeng Mountain and Niulanjiang Basin in the upper reaches of the Yangtze River. It is the main distribution area of Black-necked Cranes, accounting for nearly 10% of the global population. However, traditional and monocultural farming practices in the reserve historically led to slow income growth, creating an intensive conflict between conservation and development. To address the challenge, based on the perspective of community collaborative development, the reserve has carried out innovative attempts in the 10,000-mu cropland base, science education platforms, public welfare monitoring, and the integration of ecological, living, and production spaces. These efforts have established the “Nianhu Model” under a new development concept, which is summarized as follows.

1. Develop a green economy and build a 10,000-mu base

The reserve adheres to the principle of combining ecological industrialization and industrial ecology, following the philosophy of protection-first and green development. Leveraging its resource advantages and utilizing national ecological conservation compensation funds, it has guided local communities to adjust their agricultural planting structures and establish four 10,000-mu bases for potato seeds, oat seeds, plateau pollution-free vegetables, and Chinese medicinal materials. By introducing specialized agricultural enterprises and adopting market-oriented operations, the initiative has increased incomes for over 2,000 local households, with projected annual output value expected to reach 368 million yuan by 2025. This measure not only provides abundant food sources for Black-necked Cranes but also revives rural economy, achieving a win-win outcome for both ecological conservation and economic development.

2. Carry out natural education and establish science education platforms

According to the requirements of National Forestry and Grassland Administration on promoting nature education, the reserve has introduced scientific knowledge into local communities. With a focus on wetland conservation, front yards from 21 families have been transformed into science education sites. Professional nature education institutions have been invited by the reserve to integrate community resources and build nature education facilities such as nature trails and bird-watching platforms. A profit-sharing mechanism was established to involve community residents in providing nature education services. Through organizing activities such as nature lessons, experiential learning, and observation, the initiative has generated over 1.8 million yuan in additional income for community residents. By the end of 2025, it is projected to provide more than 5,000 participants with nature education activities. This measure has enhanced public awareness of conservation and broadened the pathways for realizing the value of ecological products.

3. Make up for public welfare scientific research and promote public welfare monitoring

In order to make up for the lack of scientific research and monitoring capacity, the reserve has initiated a

"public welfare scientific research and monitoring" system, recruiting individuals from across the country who are passionate about ecological and environmental conservation. In 2025, a total of 58 individuals from Yunnan, Guizhou, Sichuan, Hebei, Anhui and Heilongjiang were appointed as public welfare scientific research monitors. Through professional training, agreement signing, credential-based employment, and rigorous assessment processes, they were integrated into the reserve's research and monitoring efforts. Leveraging their familiarity with the local environment, these volunteers made the first documented sightings of nationally Class I protected species such as the Hooded Crane, Eastern Imperial Eagle, and Forest Musk Deer, while also recording breeding data for various bird species. This initiative has set an exemplary model for enhancing scientific research capacity in the reserve.

4. Innovate the management protection mechanism and create the "production-living-ecological spaces"

Based on the "production-living-ecological" spatial layout, the reserve has been divided under a new model. (1) Residential areas are designated as living units, with investments in wastewater collection and treatment facilities to comprehensively manage the wetland watershed and strictly control pollution discharge. (2) Farmland is designated as production units, with restrictions on infrastructure construction that affect bird foraging, standardized use of fertilizers and pesticides, and the establishment of a residual plastic film recycling mechanism. (3) The wetlands surrounding the Black-necked Crane habitats are designated as ecological units, with access prohibited to all people. Through this refined management approach of "unit-based control and list-based management", the "Nianhu Model" has been established, ensuring both the normal livelihood activities of community residents and the precise protection of the Black-necked Crane habitats.

After years of practice, the conservation outcomes in the reserve have been remarkably significant. (1) Over the past five years, the number of cranes has increased from 860 to 1,647, the number of bird species from 181 to 229, National Class I Key Protected e Wildlife animals from 6 to 9 species, and National Class Ⅱ Key Protected Wildlife animals from 17 to 29 species. Some migratory birds have become resident birds and now breed locally at Nianhu. (2) The 2024 five-year conservation effectiveness assessment conducted by the Ministry of Ecology and Environment rated the reserve in ecological environment quality as Grade I, with an overall evaluation of "Excellent". (3) The "Nianhu Model" composed of the "10,000-mu bases, science education platforms, public welfare monitoring, and production-living-ecological spaces", has achieved a positive interaction between ecological conservation and economic development in the Huize Nature Reserve.

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四川乐安保护区湿地恢复效果明显

韦宝玉
UNDP-GEF 四川湿地保护项目，四川 成都 610074

四川乐安湿地自然保护区（简称乐安保护区）位于四川省凉山彝族自治州布拖县境内，地处大、小凉山分界地带，属长江上游金沙江流域。保护区 2003 年成立，总面积 1,9623.8 ha，属于森林与湿地并存的复合生态系统。海拔 2,700 m，拥有湖泊与沼泽湿地约 670 ha，还分布有厚度 3~8 m 的泥炭沼泽湿地。

保护区建立前，这片彝语称为"依莫伙尔"（意为水草丰美的地方）的湿地，曾面临严重的生态危机。周边社区挖沟排水、开垦农田、挖取泥炭、捡拾鸟蛋、过度放牧等行为，导致湿地水位下降近 2 m，面积骤减至不足 1,000 亩，生物多样性不容乐观。

为了扭转这一局面，当地政府与保护区管理部门自 2001 年起开始行动，实施了生态移民、填沟堵水、宣传教育、配备湿地管护员、污水处理、禁牧禁捕等一系列扎实的保护修复措施。2007 年，专门成立"布拖县乐安湿地自然保护区管理处"，为资源管护提供组织保障。

资源管护带来了显著的生态成效。保护区内湿地面积从不足 1,000 亩恢复至 12,000 余亩。2020 年

保护区综合科学考察记录到，区内现有大型真菌 93 种、高等植物 895 种、昆虫 374 种、脊椎动物 231 种；黑颈鹤数量从 2008 年的 2 只增长至每年稳定的 35 只左右，并在此越冬；黑鹳从 2001 年的 1 只增长至 18 只左右；2024 年新监测到 6 只东方白鹳。此外，还监测到灰鹤约 200 只、斑头雁约 300 只，白骨顶、赤麻鸭、苍鹭、白眼潜鸭等其它越冬水鸟超过 5,000 只。

此外，保护区的环境质量也在持续改善，水质稳定达到III类以上。生态恢复还带动了绿色经济，“湿地风光旅游”和“观鸟赏鸟”成为乐安新名片。由于该保护区与贵州威宁草海、云南大山包黑颈鹤自然保护区共同形成候鸟南北迁徙通道，每年冬季，黑颈鹤、黑鹳、斑头雁、灰鹤等珍稀候鸟成群而至，吸引大量摄影爱好者和游客，观鸟旅游逐步兴起。乐安湿地相继荣获“四川十大最具人气湿地”“凉山十佳河湖”“四川最美高原湿地”等称号，“人在农田劳作，鹤在农田陪伴”的和谐画卷正在缓缓展开！

乐安湿地的成功恢复，不仅为黑颈鹤等候鸟迁飞通道提供了关键节点，而且探索出低成本、可持续、社区参与的湿地保护路径，更填补了四川省黑颈鹤稳定越冬的空白，成为高原湿地生态修复的典范，具有重要的推广价值和深远的生态意义。

图 1. 保护区建立后的湿地（韦宝玉 摄）

Figure 1. Wetland restored after the establishment of the reserve (Photo by Wei Baoyu)

图 2. 越冬的黑颈鹤（乐安保护区供图）

Figure 2. Wintering Black-necked Cranes at Le’an (Photo provided by Le’an Nature Reserve)

图 3. 栖息的水鸟（乐安保护区供图）

Figure 3. Oriental White and Black Storks and other waterbirds at Le'an Wetland (Photo provided by Le'an Nature Reserve)

Wetland restoration in the Sichuan Le'an Nature Reserve

WEI Baoyu

UNDP-GEF Sichuan Wetlands Conservation Project, Chengdu 610074

Sichuan Le'an Wetland Nature Reserve (referred to as Le'an Nature Reserve) is located in Butuo County, Liangshan Yi Autonomous Prefecture, Sichuan Province. It is located at the boundary between Daliangshan and Xiaoliang Mountains and in the Jinsha River basin in the upper reaches of the Yangtze River. The nature reserve was established in 2003, with a total area of 19,623.8 ha, and represents a composite ecosystem integrating both forest and wetland habitats. At an elevation of 2,700 m, the reserve contains approximately 670 ha of lake and marsh wetlands, including peatland areas with peat layers 3-8 m thick.

The wetland in the reserve is called "Yimohuoer" locally in the Yi language (meaning a place with abundant water and plants) Before the reserve was established, the wetland called ". The wetland had faced a serious ecological crisis before being protected, from activities such as ditch-digging for drainage, farmland reclamation, peat extraction, bird egg collection, and overgrazing by surrounding communities, causing the wetland's water level to drop by nearly 2 meters and its area to shrink drastically to less than 1,000 mu (~66.67 ha). As a result, biodiversity was in a precarious state.

In order to reverse this situation, the local government and reserve administration have been taking action since 2001. They implemented a series of concrete conservation and restoration measures, including human environmental relocation, the filling of drainage ditches to impound water, public awareness campaigns, the deployment of wetland rangers, wastewater treatment, and grazing and fishing bans. In 2007, the "Management Office of Butuo County Le'an Wetland Nature Reserve" was established to provide an institutional foundation for resource management.

Resource management and conservation have brought significant ecological benefits. The wetland area within the reserve has been restored from less than 1,000 mu to over 12,000 mu. According to the comprehensive scientific survey of the reserve in 2020, the area currently hosts 93 species of macrofungi, 895 species of vascular plants, 374 species of insects and 231 species of vertebrates. The number of Black-necked Cranes wintering at the reserve has increased from just 2 individuals in 2008 to a stable annual count of

around 35. Black Storks have rebounded from a single individual in 2001 to approximately 18, while 6 Oriental White Storks were newly monitored and recorded in 2024. Furthermore, surveys have documented about 200 Common Cranes, around 300 Bar-headed Geese, and over 5,000 other overwintering waterbirds, including Eurasian Coots, Ruddy Shelducks, Grey Herons, and Ferruginous Ducks.

Furthermore, the environmental quality of the reserve has continued to improve, with its water quality consistently meeting or exceeding Class III standards. The ecological restoration has also improved the growth of a green economy, with "wetland scenic tourism" and "bird watching and appreciation" emerging as new industries for Le'an. As the reserve forms a critical migratory corridor alongside Caohai (Guizhou) and Dashanbao (Yunan) Nature Reserves, it now hosts flocks of rare migratory birds such as Black-necked Cranes, Black Storks, Bar-headed Geese, and Common Cranes each winter. This annual spectacle attracts a large number of photography enthusiasts and tourists, and birdwatching tourism is a growing local industry.

The Le'an Wetland has been honored with a series of prestigious titles, including "Sichuan's Top Ten Most Popular Wetlands", "Liangshan's Top Ten Rivers and Lakes", and "Sichuan's Most Beautiful Plateau Wetland". A harmonious scene is now unfolding, one where "people till the farmland with cranes accompanying them".

The successful restoration of Le'an Wetland not only provides a key habitat for migratory birds such as Black necked Cranes, but also explores a low-cost, sustainable, and community-participatory wetland protection approach, validating Sichuan as a wintering place for Black-necked Cranes besides a breeding stronghold and becoming a model for ecological restoration of high-altitude wetlands. It has important promotional value and profound ecological significance.

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云南会泽黑颈鹤保护区开展“小鹤学堂”教材开发暨教案优化研讨活动

沈琴芬 朵华 袁嵘
云南会泽黑颈鹤国家级自然保护区管护局, 云南 会泽 654200

为进一步加强生物多样性保护宣传教育，提升自然教育志愿者队伍的专业能力，2025 年 9 月 19 日，云南会泽黑颈鹤国家级自然保护区（简称会泽保护区）管护局在长海子管理所组织“小鹤学堂”教材开发暨第一版教案优化研讨活动。

本次研讨活动以推动生态保护理念融入社区、学校与公众生活为宗旨，围绕黑颈鹤保护、湿地生态系统和候鸟迁徙等主题，通过专业化、系统化的教材建设与课程优化，打造具有地方特色的“小鹤学堂”自然教育课程体系。活动主要包含两方面内容：一是对 2024 年度“小鹤学堂”已实施的教师教学教案进行复盘与优化，进一步完善教学设计与内容编排，为下一年度的自然教育室内教学课程实施奠定基础；二是聚焦“小鹤学堂”学生教材开发，组织与会人员共同研讨教材结构、内容选材与教学实践方案，推动该教材逐步走入课堂，帮助广大学生深入理解湿地与鸟类保护的重要性。

2024 年会泽鹤管局联合会泽县教体局培训了保护区所在地 2 个乡（镇）19 所小学的 63 名教师作为“小鹤学堂”教师志愿者，组建“保护区+学校”的“区校共建”教学模式，在保护区所在地的大桥乡和者海镇 19 所小学 31 个班级 1400 余名学生中全面推广“小鹤学堂”课程教学，编排鹤元素舞蹈《守护》，举办“小鹤杯”教职工运动会，构建了 1-6 年级“小鹤学堂”进阶课程体系。该活动将自然知识转化为生动有趣的教育形式，激发教师传递生态理念的内生动力。

黑颈鹤作为国家一级保护动物，是我国高原湿地生态系统的重要指示物种。会泽保护区致力于黑颈鹤栖息地保护与公众自然教育工作，“小鹤学堂”正是保护区内开展自然教育的重要平台之一。此

次研讨不仅是对已有教育成果的总结与提升，更是推动“教育一个孩子、带动一个家庭、影响整个社区”生态保护机制的重要举措。

通过本次研讨活动，能够凝聚更多专业力量和社区资源，构建更加科学、生动的自然教育内容体系，进一步扩大生态保护宣传的覆盖面和影响力，为实现人与自然和谐共生的长远目标提供教育支持。

图 1-5. “小鹤学堂”研讨及活动

Figure 1-5. Nature education activities under “Crane School” program

Development of “Crane School” teaching materials and plans by Yunnan Huize Nature Reserve

SHEN Qinfen, DUO Hua, YUAN Rong
Yunnan Huize Black-necked Crane Nature Reserve Administration, Huize 654200

In order to further strengthen the education of biodiversity conservation and build the capacity of a volunteer team for nature education, Yunnan Huize Black-necked Crane Nature Reserve Administration (referred to as Huize Nature Reserve) organized a seminar to develop teaching materials and revise the first edition of teaching plans for “Crane School” at Changhaizi Management Station of the reserve on September 19, 2025.

The seminar was aimed at integrating the concept of ecological protection into activities by local communities, schools and the general public. It focused on themes including the protection of Black-necked Cranes, wetland ecosystems and migration of migratory birds, to create a nature education system featuring mainly “Crane School” with local characteristics through specialized and systematic teaching material development. The seminar mainly covered two aspects: the first reviewed and revised the teaching plans of “Crane School” in 2024, further improved the instructional design and content arrangement, and planned for the implementation of indoor nature education courses for the next year. The second focused on the development of textbooks, organized participants to discuss the structure and content selection of textbooks and teaching practice plans. Through the seminar, we expected to gradually introduce the textbook into the classroom and help students deeply understand the importance of protecting wetlands and birds.

In 2024, the Huize Nature Reserve in collaboration with the Education and Sports Bureau of Huize County, trained 63 teachers from 19 primary schools in 2 townships within the reserve as “Crane School” volunteers. This cooperation between the reserve and schools in nature education promoted “Crane School” comprehensively among more than 1400 students in 31 classes of 19 primary schools from Daqiao and Zhehai Townships, where the reserve is located. They also choreographed a dance performance with crane elements named “Guardian”, held teachers’ sports game “the Little Crane Cup”, and constructed an advance curriculum system for grades 1-6. These activities transformed nature knowledge into vivid and interesting forms of education, and motivated teachers to promote ecological concepts.

As a National First-class Protected Animal, the Black-necked Crane is an important indicator species of plateau wetland ecosystem. Huize Nature Reserve is dedicated to protect habitat of the Black-necked Crane and to carry out public nature education. “Crane School” is one of the important platforms for nature education within nature reserves. The seminar is not only a summary and enhancement of existing educational achievement, but also an important measure to promote the ecological protection mechanism of “educating a child, driving a family, influencing the entire community”.

Through this seminar, we can gather more professional strength and community resources, build a sound nature education system, further expand the coverage and influence of ecological protection publicity, provide educational support for achieving the long-term goal of harmonious coexistence between humanity and nature.

【其他水鸟消息】
[News on Other Waterbirds]

吉林向海保护区 2025 年东方白鹳繁殖现状及保护建议

李连山 夏占平 刘蕾 于海龙 王昊岩
吉林向海国家级自然保护区管理局，吉林 通榆 137215

1. 2025 年东方白鹳繁殖情况

2025 年向海保护区共监测到东方白鹳巢 63 个（人工招引巢 13 个；自然巢 50 个，其中高压线铁塔 7 巢、农田喷灌铁架 1 巢、监控塔 1 巢、百鸟园边柱 1 巢、榆柳杨树 40 巢），较 2024 年多 15 巢，达保护区新高。其中，5 个自然巢繁殖失败（2 巢被大风吹落），58 巢共成功繁殖雏鸟 163 只（人工招引巢 13 个 40 只雏鸟、自然巢 45 个 123 只雏鸟）。

高压线铁塔自然巢繁殖成功，归功于向海保护局与电力部门的有效沟通与协调；人工招引巢采用铁制框架设计与科学巢材配置，显著提升了结构稳定性与抗干扰能力。

自然巢分布有 3 个集中区域，分别为东方白鹳核心区、向海水库岛屿、长龙坨附近，这 3 个分布区距离湖泊、沼泽采食地较近，其余巢相对较为分散。

2. 基于电力部门的东方白鹳管护建议

（1）春季开展巢专项监测与信息共享

每年 2 月下旬—4 月上旬保护区组建专项监测组，采用无人机巡查与地面定点观测相结合的方式，排查辖区内所有可能的巢基，记录东方白鹳巢的位置、亲鸟活动状态及卵雏数量，建立“巢信息台账”，将相关的巢信息台账同步至电力部门，双方共同确定“重点关注巢体”（如已产卵的活性巢），避免因信息不对称导致误拆。

（2）电力部门对东方白鹳巢开展安全评估

分为两类处理：①安全类巢（不影响变压器运行）。由保护区管理局在巢体周边 50m 内设置警示标牌（如“东方白鹳繁殖巢，禁止靠近”），电力部门推迟拆除至繁殖期结束（7 月下旬，幼鸟学会飞行），期间定期开展安全巡查，避免意外；②风险类巢（存在短路风险）。由保护区管理局与电力部门共同制定“巢体转移方案”，确保转移过程中卵雏安全。

（3）科学划定人工招引巢的适宜搭建区域

一方面应该以自然巢选址参数为基准，确保人工巢的空间布局与东方白鹳繁殖习性高度匹配；另一方面需结合保护区内东方白鹳现有繁殖种群密度、巢址资源缺口及生境承载力评估结果，避免因巢址过度集中导致的种内竞争加剧，或因分布零散降低招引成功率。最终通过精准化的营建人工招引巢，为东方白鹳繁殖群体提供数量充足、质量达标的可利用巢基，有效弥补自然巢址不足的瓶颈，助力东方白鹳群体繁殖成效稳步提升。

图 1-2. 向海保护区东方白鹳
Figures 1-2. Oriental White Storks in Xianghai Nature Reserve

图 3-4. 向海保护区东方白鹳
Figures 3-4. Oriental White Storks in Xianghai Nature Reserve

Status and Protection Recommendations of Oriental White Storks Breeding at Jilin Xianghai National Nature Reserve in 2025

LI Lianshan, XIA Zhanping, LIU Lei, YU Hailong, WANG Haoyan
Jilin Xianghai National Nature Reserve Administration, Tongyu 137215

1. Breeding status of Oriental White Stork in 2025

In 2025, a total of 63 Oriental White Stork nests were monitored at Xianghai Nature Reserve， including 13 artificial nests and 50 natural nests. Among the natural nests, 7 were built on high-voltage transmission towers, 1 on a farmland sprinkler irrigation iron frame, 1 on the top of a monitoring tower, 1 on one of side pillars supporting a huge net cover for a bird cage, and 40 on elm, willow, or poplar trees. This marks a 15-nest increase from 2024 and sets a new record high for the reserve. Five of the natural nests failed to reproduce (2 nests were destroyed by strong winds). The remaining 58 nests successfully bred 163 fledglings in total (40 from 13 artificial nests and 123 from 45 natural nests).

The successful breeding of nests on high-voltage transmission towers was attributed to the effective communication and coordination between Xianghai Nature Reserve and the power department. The artificial attraction nests adopted strong iron frames and scientifically selected nest materials, which have significantly enhanced the structural stability and anti-interference ability.

The natural nests were concentrated in 3 key areas: the Oriental White Stork Core Area, the island within Xianghai Reservoir, and vicinity of Changlongtuo. The 3 distribution areas are close to their foraging places in lakes and marshes, while the remaining natural nests were relatively scattered.

2. Suggestions on the management and protection of Oriental White Stork based on the power sector

(1) Special nest monitoring and information sharing in spring

Each year, from late February to early April, the reserve establishes a dedicated monitoring team. They employ a combination of drone patrols and fixed-point ground observations to survey all potential nesting sites within its jurisdiction. They record the location of each Oriental White Stork nest, the behavior of the parent birds, and the number of eggs and fledglings, and establish a detailed “Nest Information Ledger”. This ledger is shared with the power sector to facilitate joint identification of “Key Nests” that require special attention (e.g., active nests with eggs), to avoid accident removal caused by information asymmetry.

(2) Safety assessment of Oriental White Stork nests by the power sector

There are two types of safety assessment: a) power safe nests. The reserve administration installs warning signs within 50 meters around the nest (e.g., “Oriental White Stork Breeding Nest-Keep Away”). The power sector would not remove the nest until the end of the breeding season (late July, when the fledglings can fly). During this period, regular safety inspections are conducted to avoid accidents. b) power risk nest. The reserve administration and power sector jointly develop a “Nest Relocation Plan” to ensure the safety of eggs and fledglings during the transfer process.

(3) Scientific delimitation of suitable areas for artificial attraction nests

On the one hand, the placement of artificial nests should be guided by the site-selection parameters of natural nests to ensure their spatial distribution closely aligns with the breeding habits of Oriental White

Storks. On the other hand, this involves integrating data on the current breeding population density, the lack of suitable nesting sites, and habitat carrying capacity within the reserve. This integrated approach helps prevent intensified intraspecific competition due to excessively clustered nest placements that lead to reduced attraction success caused by overly dispersed distribution.

The ultimate goal is to construct well-designed artificial attractant nests that provide the Oriental White Stork breeding population with a sufficient number of high-quality, usable nesting bases. This effectively mitigates the bottleneck of natural nest site shortages and contributes to the steady improvement of the population's reproductive success.

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吉林向海保护区疣鼻天鹅迁徙与繁殖现状

李连山 夏占平 刘蕾 于海龙 王昊岩
吉林向海国家级自然保护区管理局，吉林 通榆 137215

疣鼻天鹅是国家二级重点保护野生动物，主要栖息于水草或芦苇较为丰富的湖泊、沼泽等生境。2009 年以来，吉林向海国家级自然保护区（简称向海保护区）相继监测到疣鼻天鹅的迁徙群体和繁殖群体。

最大迁徙群体为 2020 年 5 月 21 日在青年坝附近记录到的 34 只，其次是 2022 年 3 月 31 日在东闸门西南水面的 16 只。迁徙群体主要分布于创业水库、向海水库、青年坝等湖泊与沼泽湿地。

2017 年 7 月 9 日，观察到 2 只成鸟和 5 只雏鸟，在核心区芦苇湿地取食，雏鸟约 50 日龄，这是疣鼻天鹅在向海保护区成功繁殖的首次记录，也是吉林省的首次繁殖记录。这对疣鼻天鹅自 2017 年开始，连续在向海保护区内繁殖，截止到 2025 年已经繁殖 9 年；其中，2017 年繁殖 5 只幼雏，2018-2022 年每年繁殖 6 只幼雏，2023 年 5 月 13 日，在青年坝未监测到雏鸟，推测雏鸟隐藏于青年坝丰茂的沼泽草丛里；2024-2025 年繁殖活动恢复，每年均记录到 5 只雏鸟。2017-2025 年共记录到 45 只雏鸟。

图 1-4 向海保护区疣鼻天鹅
Figures 1-4. Mute Swans in Xianghai Nature Reserve

Migration and Breeding Status of Mute Swan at Xianghai National Nature Reserve, Jilin

LI Lianshan, XIA Zhanping, LIU Lei, YU Hailong, WANG Haoyan
Jilin Xianghai National Nature Reserve Administration, Tongyu 137215

The Mute Swan is listed under China's National Class II Key Protected Wildlife. It mainly inhabits lakes and swamps with abundant aquatic plants or reeds. Since 2009, migratory and breeding populations of Mute Swans have been successively monitored in Jilin Xianghai National Nature Reserve (referred to as Xianghai Nature Reserve).

The largest migratory group of 34 Mute Swans was recorded near Qingnian Dam on May 21, 2020; this was followed by a group of 16 individuals on the southwest water surface of Dongzhamen on March 31, 2022. These birds are mainly seen in Chuangye Reservoir, Xianghai Reservoir, and Qingnian Dam, etc. in the reserve.

On July 9, 2017, 2 adult Mute Swans and 5 their fledglings, approximately 50 days old, were observed foraging in the reed wetland of the reserve's core area. This is the first record of successful breeding nearly two months of Mute Swans in Xianghai Nature Reserve, and also the first confirmed record of such breeding success for Jilin Province. Before this year, Mute Swans had been seen nesting, but not as successfully as this year. Since 2017, this pair of swans has been breeding consecutively in Xianghai Nature Reserve for 9 years as of 2025. Five chicksin 2017, and 6 chicks s from 2018 to 2022were recorded every year., No chicks were observed at Qingnian Dam during our routine monitoring on May 13, 2023, as they were likely hidden in the lush marsh vegetation. Breeding resumed in 2024 and 2025, with 5 fledglings recorded in each year. In summary, a total of 45 chicks have been recorded in 2017-2025.

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黑龙江扎龙保护区 2025 年秋季水鸟监测

徐卓 杜微 刘骅峻 时圣旭 高歌
黑龙江扎龙国家级自然保护区管理局，黑龙江 齐齐哈尔 161000

2025 年秋季黑龙江扎龙国家级自然保护区科研宣教中心开展了秋季水鸟迁徙调查，监测地点为天鹅湖、八支干、九支干、龙头街、克钦湖、长沟、林齐岛、军马场、邵地房子、特勒、八宝、满代、翁海、马圈岗等 30 个点。

本次调查共统计到水鸟 15 目 25 科 61 种 88540 只，以雁鸭类、鹤类为主。国家一级保护鸟类 6 种 3739 只，分别为丹顶鹤、白枕鹤、白鹤、白头鹤、东方白鹳、大鸨；国家二级保护鸟类 14 种 11481 只，包括灰鹤、大天鹅、白额雁、鸿雁、花脸鸭、白琵鹭、普通鵟、鹊鹞、白腹鹞、白尾鹞、红隼、红脚隼、游隼、灰背隼。

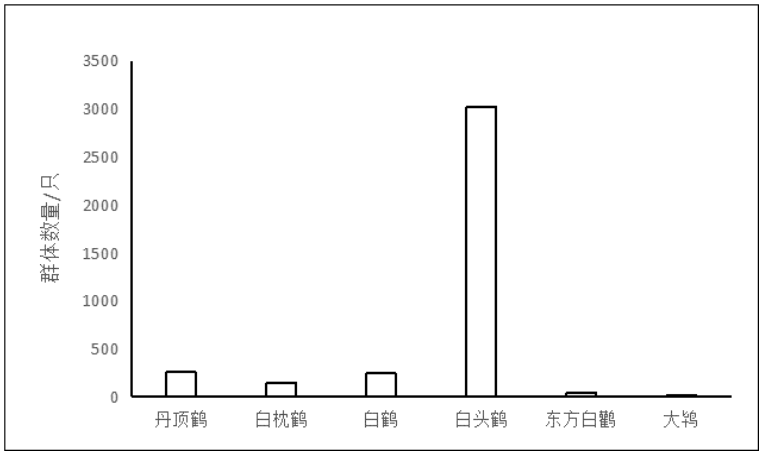

图 1. 扎龙保护区国家一级保护鸟类群体数量
Figure 1. Numbers of bird species of China's National Class I Key Protected Wildlife during autumn migration in 2025 at Zhalong NNR

Waterbirds recorded during 2025 autumn migration at Zhalong National Nature Reserve, Heilongjiang

XU Zhuo, DU Wei, LIU Huajun, SHI Shengxu, GAO Ge
Heilongjiang Zhalong National Nature Reserve, Qiqihar 161000

In the autumn of 2025, the Scientific Research and Publicity Center of Heilongjiang Zhalong National Nature Reserve (referred to as Zhalong Reserve) conducted a survey on the autumn waterbird migration. The monitoring covered 30 sites, including Swan Lake, Bazhigan, Jiuzhigan, Longtoujie, Keqin Lake, Changgou, Linqi Island, Junma Farm, Shaodifangzi, Tele, Babao, Mandai, Wenghai, and Maquangang.

A total of 88,540 waterbirds belonging to 61 species, 15 orders and 25 families, were counted in this survey, with geese and ducks and cranes as the dominant groups. There were 3,739 individuals of 6 species listed under China's National Class I Key Protected Wildlife, including the Red-crowned Crane, White-naped Crane, Siberian Crane, Hooded Crane, Oriental Stork, and Great Bustard. Additionally, the survey counted 11,481 individuals of 14 species listed under China's National Class II Protected Wildlife, including Common Crane, Whooper Swan, Greater White-fronted Goose, Swan Goose, Baikal Teal, Eurasian Spoonbill, Eastern Buzzard, Pied Harrier, Eastern Marsh Harrier, Hen Harrier, Common Kestrel, Amur Falcon, Peregrine Falcon, and Merlin.

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四川若尔盖保护区 2025 年春季迁徙季花湖区域水鸟调查

索郎夺尔基 卓玛姐 纳么玖
四川若尔盖湿地国家级自然保护区管理局，四川 若尔盖 624599

2025 年 3 月 17 日，四川若尔盖湿地国家级自然保护区（简称若尔盖保护区）在花湖区域设置 3 处点位，开展了春季迁徙水鸟调查。本次调查共记录到水鸟 24 种 5592 只。其中，国家一级保护鸟类 2 种，为黑鹳、白尾海雕；国家二级重点保护鸟类 2 种，为大天鹅、斑头秋沙鸭。

花湖是若尔盖保护区迁徙水鸟的重要栖息地及迁徙停歇地，保护区将持续加强监测和保护力度，致力于构建更加完善的保护体系，为候鸟迁徙和湿地生态系统的可持续发展提供坚实而有力的保障。

表 1. 2025 年 3 月若尔盖保护区花湖水鸟种类及数量
Table 1. Species and numbers of waterbirds recorded at Ruoergai Nature Reserve in March 2025

序号和种类	数量	序号和种类	数量
1. 黑鹳	1	2. 绿头鸭	1015
3. 大天鹅	2	4. 赤麻鸭	81
5. 斑头秋沙鸭	2	6. 琵嘴鸭	310
7. 大白鹭	75	8. 针尾鸭	1026
9. 中白鹭	23	10. 赤膀鸭	127
11. 苍鹭	4	12. 赤嘴潜鸭	472
13. 凤头麦鸡	64	14. 凤头潜鸭	148
15. 白骨顶	224	16. 白眼潜鸭	37
17. 灰雁	87	18. 红头潜鸭	917
19. 斑头雁	1	20. 赤颈鸭	53
21. 棕头鸥	101	22. 白眉鸭	1
23. 绿翅鸭	814	24. 白尾海雕	7
合计		5592	

图 1. 调查人员合影(雷睿涛 摄)
Figure 1. Group photo of investigators (Photo by Lei Ruitao)

图 2. 群鸟(纳么玖 摄)
Figure 2. A flock of birds (Photo by Namojiu)

图 3. 绿翅鸭、针尾鸭、白骨顶等(纳么玖 摄)
Figure 3. Green-winged Teals, Northern Pintails, Common Coots et al. (Photo by Namojiu)

Survey of Waterbirds in Huahu Area in 2025 at Ruoergai Nature Reserve, Sichuan

SUOLANG Duoerji, Zhuomajie, Namojiu
Ruoergai Wetland National Nature Reserve Administration, Ruoergai 624599

Ruoergai Wetland National Nature Reserve, Sichuan (referred to as Ruoergai Nature Reserve) conducted a survey on spring migratory waterbirds on March 17, 2025. We made observations at 3 sites in Huahu area and recorded a total of 5592 waterbirds of 24 species. Among them, 2 species are National First-class Protected birds: Black Stork and White-tailed Sea-eagle, and 2 species are National Second-class Protected birds: Whooper Swan and Smew.

Huahu is an important habitat and a stopover site for migratory waterbirds in Ruoergai Nature Reserve. Waterbirds are widely seen across migration seasons with stable populations. Our next steps are to continue enhancing monitoring and conservation efforts, committed to building a more comprehensive protection system, and provide a solid and strong guarantee for the migration of migratory birds and sustainable development of wetland ecosystems.

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四川若尔盖保护区国家重点保护野生动植物名录

索郎夺尔基 卓玛姐 纳么玖
四川若尔盖湿地国家级自然保护区管理局，四川 若尔盖 624599

四川若尔盖湿地国家级自然保护区始建于 1994 年，1998 年晋升为国家级自然保护区，2008 年被列入“国际重要湿地名录”。保护区总面积为 166570.6 ha，主要保护对象是高寒泥炭沼泽湿地生态系统和黑颈鹤等珍稀野生动植物。根据保护区 2016 年动植物多样性调查报告显示，区域内分布有脊椎动物 237 种，常见维管束植物 423 种，其中国家一级保护野生动物 9 种、二级保护动物 25 种。

结合保护区工作人员常年监测数据，对比《若尔盖湿地国家级自然保护区动物多样性（2016 年）》资料，参考《国家重点保护野生动物名录》（2021），保护区国家重点保护野生动物有所增加，其中国家一级保护动物从 9 种增加到 17 种、二级保护动物从 25 种增至 52 种。

一、国家重点保护野生动物（69 种）

（一）国家一级保护野生动物（17 种）

黑颈鹤、黑鹳、白鹳、金雕、玉带海雕、马麝、斑尾榛鸡、白尾海雕、胡兀鹫、秃鹫、草原雕、猎隼、荒漠猫、豺、东方白鹳、彩鹮、四川羚牛。

（二）国家二级保护野生动物（52 种）

1.鸟类 38 种：大天鹅、疣鼻天鹅、小天鹅、黑鸢、大鵟、普通鵟、毛脚鵟、高山兀鹫、白尾鹞、游隼、燕隼、灰背隼、红隼、灰鹤、领鸺鹠、斑头鸺鹠、纵纹腹小鸮、雕鸮、凤头蜂鹰、苍鹰、蓝马鸡、鹦嘴鹛、黑颈鸊鹈、朱鹮、云雀、蒙古百灵、大噪鹛、橙翅噪鹛、中华雀鹛、蓑羽鹤、角鸊鹈、白琵鹭、斑头秋沙鸭、花脸鸭、大杓鹬、白额雁、白腹鹞、白头鹞。

2.兽类 10 种：狼、水獭、豹猫、兔狲、猞猁、藏原羚、中华鬣羚、藏狐、赤狐、岩羊。

3.鱼类 4 种：骨唇黄河鱼、极边扁咽齿鱼、厚唇裸重唇鱼、拟鲇高原鳅。

二、国家重点保护野生植物（2 种）

国家二级保护野生植物（2 种）：报春花科羽叶点地梅、罂粟科红花绿绒蒿。

List of National Key Protected Wildlife at Ruoergai Nature Reserve, Sichuan

SUOLANG Duoerji, Zhuomajie, Namojiu
Ruoergai Wetland National Nature Reserve Administration, Ruoergai 624599

Ruoergai Wetland National Nature Reserve, Sichuan, was established in 1994 and was promoted to a national nature reserve in 1998. In 2008, it was listed in “The List of Wetlands of International Importance”. The total area of nature reserve is 166570.6 ha, and the key protected objects are the alpine peat wetland ecosystem and rare wildlife such as the Black-necked Crane. According to the survey report of biodiversity in the reserve in 2016, 237 species of vertebrates, including 9 species of national first-class protected animals and 25 species of national second-class protected animals, and 423 species of common vascular plants, were recorded in the area.

In recent years, through long-term monitoring by the reserve staff and comparing with the wildlife information from “Animal Diversity of Ruoergai Wetland National Nature Reserve (2016)”, more than 35 species of national key protected animal species have been recorded in the reserve in 2025, including Demoiselle Crane, Oriental White Stork, Glossy Ibis, Eurasian Spoonbill, Horned Grebe, Baikal Teal, Smew, Far Eastern Curlew, Greater White-fronted Goose, Western Marsh Harrier, Eastern Marsh Harrier, etc. The number of national first-class protected animals in the reserve has increased from 9 to 17 species and for second-class protected animals has increased from 25 to 52 species. In accordance with “List of National Key Protected Wild Animals” released in 2021, the reserve has verified the national key protected wildlife within its area with the results as follows.

National key protected animals (69 species)

(1) National first-class protected animals (17 species)

Black-necked Crane, White-tailed Eagle, Pallas's Fish Eagle, Golden Eagle, Steppe Eagle, Bearded Vulture, Cinereous Vulture, Saker Falcon, Black Stork, Oriental White Stork, Glossy Ibis, Chinese Grouse, Sichuan Takin, Alpine Musk Deer, Chinese Mountain Cat and Dhole.

(2) National second-class protected animals (52 species)

a. Aves (38 species): Whooper Swan, Mute Swan, Tundra Swan, Black Kite, Upland Buzzard, Eastern Buzzard, Rough-legged Buzzard, Himalayan Vulture, Hen Harrier, Peregrine Falcon, Eurasian Hobby, Merlin, Common Kestrel, Common Crane, Collared Owlet, Asian Barred Owlet, Little Owl, Eurasian Eagle-Owl, Oriental Honey-buzzard, Northern Goshawk, Blue Eared Pheasant, Ibisbill, Black-necked Grebe, Crested Bunting, Eurasian Skylark, Mongolian Lark, Giant Laughingthrush, Elliot's Laughingthrush, Chinese Fulvetta, Demoiselle Crane, Horned Grebe, Eurasian Spoonbill, Smew, Baikal Teal, Far Eastern Curlew, Greater White-fronted Goose, Western Marsh Harrier and Eastern Marsh Harrier.

b. Mammals (10 species): Gray Wolf, Eurasian Otter, Eurasian Lynx, Pallas's Cat, Leopard Cat, Tibetan Fox, Red Fox, Tibetan Gazelle, Chinese Serow and Blue Sheep.

c. Fish (4 species): Huanghe Naked Carp, Schizothorax extremus, Thick-lipped Naked Carp and Catfish-like Loach.

National key protected plants (2 species)

National second-class protected animals (2 species): Pomatosace Filicula, Meconopsis punicea.

【国际资讯】
[News from Overseas]

首例濒危美洲鹤因高致病性禽流感死亡病例确认

国际鹤类基金会，美国

2025年9月29日——一只被亲切地称为"Ducky"（小可爱的意思）的濒危物种美洲鹤，于9月因感染高致病性禽流感不幸离世。这是首例因确诊该病毒致死的野生美洲鹤案例。

Ducky曾是国际鹤类基金会繁殖与重引入项目的美洲鹤种群成员之一，在该基金会威斯康星州巴拉布市总部接受身着鹤服的工作人员的饲养培育。按照原定计划，它本应与今年同批的七只美洲鹤一起，于今秋在霍里康国家野生动物保护区放归自然。

尽管专业兽医和动物护理团队全力施救，Ducky仍于9月18日星期四永远离开了我们。

经研判，病毒很可能通过野生鸟类或周边环境传播。目前饲养在霍里康保护区准备今秋一同放归的另外七只美洲鹤可能也接触了禽流感病毒，但未出现感染症状，仍持续接受严密监护。

禽流感病毒在自然环境中存活力极强。野生鸟类（尤其是鸭、雁、天鹅等水禽）作为天然宿主，往往无症状携带病毒，通过粪便污染水源导致疫情扩散。

目前北美野生美洲鹤总数仅存约700只，其中东部迁徙种群不足70只。每损失一个个体，都意味着该种群1%以上的消亡（译者注：美洲鹤Dusky预计释放到东部种群中）。

痛失Ducky后，基金会已将生物安全防护提升至最高等级，全力守护鹤群与工作人员的安全。我们正对每只饲养鹤实施动态监测，并将根据实际情况与政府伙伴协同优化防护方案。

高致病性禽流感作为甲型流感病毒的强毒株，已在全球范围引发野鸟种群危机：今春在印第安纳州的沙丘鹤东部种群有几千只个体死亡，2023年冬季匈牙利估计有上万只灰鹤惨遭灭顶之灾。这些悲剧警示着病毒对野生鸟类的毁灭性威胁。

疫情当前，折射出瞬息万变时代中物种保护的艰巨性。尽管经过努力将美洲鹤从灭绝边缘挽回，它们仍面临着疾病、盗猎、栖息地丧失与气候变化的多重夹击，这让我们的守护使命愈发紧迫。

每一个鹤类个体的丧失都是告示我们所有人要更加付诸行动，国际鹤类基金会饲养部主任鲍德曼女士沉痛表示，我们必须携手确保美洲鹤不仅存活下来，更要世世代代繁盛。

失去年幼的Ducky令人心碎，但这份痛楚将转化为守护鹤群与家园的坚定力量。

诚邀您共同延续 Ducky 的生命印记——关注我们的守护事业，支持持续进行的保护行动。让我们携手守护这些天空精灵，让它们永远成为希望与生命力的永恒象征。

图1-2. 美洲鹤幼鸟飞行训练现场（汤姆·林恩 摄）
Figures 1-2. Whooping Crane juveniles in flight by Tom Lynn

First Confirmed Death of Endangered Whooping Crane due to Highly Pathogenic Avian Influenza

International Crane Foundation, USA

September 29, 2025 – An Endangered Whooping Crane, lovingly named "Ducky," died earlier this month due to Highly Pathogenic Avian Influenza (HPAI). The loss marks the first confirmed death of a Whooping Crane due to HPAI.

Ducky was part of the International Crane Foundation's breeding and reintroduction program and was costume-reared by the aviculture staff at the Foundation's headquarters in Baraboo, Wisc. Ducky was slated for direct release into the wild this fall at Horicon National Wildlife Refuge, along with seven other Whooping Cranes in this year's cohort.

Despite the swift emergency care provided by our specialized veterinary and animal care teams, Ducky passed away on Thursday, September 18.

It is most likely that the virus was transmitted to Ducky by a wild bird or through the environment. While the other seven Whooping Cranes in the cohort being held at Horicon NWR for their fall release may also have been exposed to the virus, none show symptoms at this time and remain under careful observation.

Avian Influenza can persist in the environment for extended periods. Wild birds, especially waterfowl such as ducks, geese, and swans, are carriers of the virus. They often carry the virus asymptomatically, shedding it through feces, which can contaminate water and spread the infection.

There are only about 700 Whooping Cranes left in the wild throughout their native range of North America. With fewer than 70 individuals in the Eastern Migratory Population, the death of just one bird reflects more than 1% of the reintroduced population.

Since Ducky's death, the Foundation raised its biosecurity protocol to the highest level to protect our flock and our staff. We continue to monitor every crane in our care and will adjust protocols as needed in consultation with state and federal partners.

HPAI is a strain of the avian influenza A virus associated with high rates of mortality in poultry and wildlife, which has severely impacted wild bird populations worldwide. Earlier this year, several thousand Sandhill Cranes in the Eastern Population succumbed to the virus in Indiana. It is estimated that over 10,000 Eurasian Cranes were killed by the virus in Hungary in the winter of 2023. Each of these are tragic examples of the potential for this virus to sicken wild birds.

The threat from HPAI underscores the challenges of conservation in a rapidly changing world. Though conservation efforts have helped Whooping Crane numbers climb from the brink of extinction, they remain highly vulnerable to disease, poaching, habitat loss, climate change, and other threats, which make our work more urgent than ever.

"Each crane lost is a call to action for all of us," said Boardman. "Together, we must ensure that Whooping Cranes not only survive but thrive for generations to come."

"It is always difficult to lose a bird, especially a young chick, but these experiences strengthen our resolve to safeguard these cranes and the landscapes they depend upon."

We invite the community to honor Ducky's legacy by learning more about our work and supporting our continued conservation efforts. Together, we can ensure these extraordinary birds remain a living symbol of hope and resilience.

六只赤颈鹤安家越南鸟栈国家公园

陈哲
国际鹤类基金会，美国

越南，2025 年 4 月 18 日——六只赤颈鹤亚成体即将在越南湄公河三角洲的鸟栈国家公园安家。国际鹤类基金会支持越南制订的赤颈鹤保护行动计划以及随后越南与泰国签署的赤颈鹤保护十年合作协议，以推动湄公河地区赤颈鹤种群的恢复工作。

图1. 赤颈鹤（Tran Triet 博士，国际鹤类基金会）
Figure 1. Sarus Cranes（Dr. Tran Triet, International Crane Foundation）

这三雄三雌赤颈鹤由泰国呵叻动物园繁育。4月10日，它们被运送至越南西贡动物园，在接受10天的隔离检疫后，将在鸟栈国家公园野化放归。

图2. 泰国呵叻动物园的工作人员正在为一只赤颈鹤幼鸟进行转运前的准备工作。
Figure 2. The Nakhon Ratchasima Zoo staff preps one of the juvenile Sarus Cranes for its transport to Vietnam

图3. 这些赤颈鹤搭乘定制的运输箱完成了本次“迁徙”
Figure 3. The Sarus Cranes “migrated” in style in personalized travel crates

鸟栈曾是一千多只赤颈鹤的栖息地，但近年来其种群数量急剧下降，某些年份甚至没有赤颈鹤的分布记录。赤颈鹤是同塔省的旗舰物种，必须采取有效地保护措施来确保其种群安全，本项目旨在湄公河三角洲建立一个留居种群。

国际鹤类基金会主席兼首席执行官Rich Beilfuss博士表示：“我们很自豪自1987年以来就与越南政府及鸟栈国家公园并肩合作，共同建立和管理这个美妙的、作为东南亚湄公河三角洲现存最大湿地的国家公园。今天，我们一起庆祝重引入的赤颈鹤在鸟栈安家，赞扬越南对赤颈鹤以及其他水鸟和人类赖以生存的健康湿地和稻田的长期保护承诺。”

国际鹤类基金会、同塔省政府、泰国动物园协会、越南动物园协会以及西贡动植物园之间的合作将集中在越南的四个部分：从泰国重引入赤颈鹤、恢复国家公园核心区的湿地和鹤类栖息地、在缓冲区发展可持续的野生动物友好型水稻种植区、开展教育项目。

这六只鹤将于本周末抵达鸟栈，越南的合作伙伴们将举行一个小型仪式庆祝它们的到来。国际鹤类基金会受邀为六只鹤中的一只命名。

国际鹤类基金会东南亚项目主任 Tran Triet 博士说：“我们很荣幸有此机会，选择了名字'TC'以纪念我们尊敬的朋友 Ngo Quoc Thang 先生。TC 是六只鹤中体型最小的，有时会受到其他鹤的欺负。我们给它取这个名字，因为我们知道它虽小但很强大，就像 Thang 先生一样。”

已故的 Ngo Quoc Thang 先生是 Tram Chim 国家公园的前副主任，在 Tram Chim 国家公园成立初期，他曾为湿地和鹤类的保护做出了卓越的贡献。"TC"也代表着"Tram Chim"，即该国家公园的名字。

图4. 2024年，国际鹤类基金会的饲养部主任Kim Boardman与保护医学主任Diana Boon博士前往越南和泰国，与Tran Triet博士团队会合。此行旨在将我们在美洲鹤重引入项目中积累的数十年经验，分享给当地新启动的重引入计划。考察期间，团队共同调研了鸟栈国家公园的一处潜在重引入场地。（图片来源：Diana Boon，国际鹤类基金会）

Figure 4. In 2024, the International Crane Foundation’s Curator of Birds, Kim Boardman, and Director of Conservation Medicine, Dr. Diana Boon, traveled to Vietnam and Thailand to join Dr. Tran Triet. Their goal was to share our decades of experience from the Whooping Crane reintroduction efforts in the United States with the new reintroduction program. Here, the field team explored a potential reintroduction site at Tram Chim National Park. Diana Boon/International Crane Foundation.

Six Sarus Cranes Sent to Tram Chim National Park Through Extraordinary Conservation Partnership

TRAN TRIET
International Crane Foundation, USA

Vietnam – April 18, 2025 – Six juvenile Sarus Cranes will soon have a new home at Tram Chim National Park in Vietnam's Mekong Delta. The International Crane Foundation helped facilitate the conservation effort to restore the species in the region, supporting Vietnam's Sarus Crane Conservation Program and the subsequent 10-year cooperation agreement between Vietnam and Thailand. This will mark the first transfer of young cranes between the two countries.

The three males and three females were reared at the Nakhon Ratchasima Zoo in Thailand. On April 10, they were successfully transferred to the Saigon Zoo in Vietnam by road and by air. The birds have been quarantined for 10 days and will soon be transferred to their new home in the wild at Tram Chim National Park.

Once home to more than 1,000 Sarus Cranes, Tram Chim has seen their population plummet in recent years, and in some cases no Sarus Cranes returned to the area at all. Sarus Cranes are rare and endangered and are considered a symbolic species for the Dong Thap region. Conservation efforts are required to ensure a thriving population and this program is designed to establish a resident population in the Mekong Delta.

Dr. Rich Beilfuss, president and CEO of the International Crane Foundation, stated: "We've been proud to work side-by-side with the Vietnamese government Tram Chim since 1987, joining together to establish and manage this wonderful national park as the biggest remaining wetland of the Mekong River Delta in Southeast Asia. Today, we celebrate the transfer of Sarus Cranes for reintroduction at Tram Chim, and we applaud Vietnam for their long-term commitment to Sarus Cranes and the healthy wetlands and rice fields that cranes, other waterbirds, and people need to thrive."

The collaboration between the International Crane Foundation, the Dong Thap Authorities, the Zoological Park of Thailand, the Vietnam Zoos Association, and the Saigon Zoo and Botanical Gardens will focus on four components in Vietnam: reintroduction of Sarus Cranes from Thailand, restoring wetlands and crane habitats in the core zone, developing sustainable wildlife-friendly rice cultivation areas in the buffer zone, and conducting an educational program."

The six cranes will be transferred to Tram Chim this weekend and a small ceremony will be held to celebrate their arrival. The International Crane Foundation was asked by Dong Thap Province to name one of the six cranes.

"We are honored to have this opportunity, and we chose the name 'TC'—for our esteemed friend Ngo Quoc Thang," said Dr. Tran Triet, International Crane Foundation's Southeast Asia Program Director. "TC is the smallest among the six cranes and is sometimes harassed by the other cranes. We gave him the name as we know he is small, but mighty, just like Thang."

The late Mr. Ngo Quoc Thang was the former vice director of Tram Chim National Park, who worked tirelessly for the conservation of wetlands and cranes during the early years of Tram Chim. "TC" also stands for "Tram Chim," the national park's name.

越南鸟栈国家公园赤颈鹤种群增长模型及景观特征分析

NGO THI KIEU TRANG 侯佳音 宋曦濂 吴庆明 邹红菲
东北林业大学，黑龙江 哈尔滨 150040

越南鸟栈国家公园（简称鸟栈公园）是赤颈鹤东方亚种（*Grus antigone sharpii*）在越南区域的主要分布地，也是越南赤颈鹤种群重引入前的野化地。但该区域的赤颈鹤种群自 1986 年被发现后整体呈下降趋势，很不乐观。为了探究鸟栈公园赤颈鹤种群下降原因，本研究从种群内在增长和外在景观环境两方面着手，利用逻辑斯蒂方程、马尔萨斯方程、周限增长率分别拟合了世代重叠种群有限环境中、世代重叠种群无限环境中、世代不重叠种群无限环境中赤颈鹤种群增长模型，并通过利用 1988-2022 年 Landsat 遥感影像，进而分析了土地利用类型和景观特征对赤颈鹤种群增长的环境阻力。

结果表明：（1）鸟栈公园赤颈鹤种群 1988-2022 年间呈衰退状态，直至数量为零。（2）用三种方法拟合了赤颈鹤种群增长模型。世代重叠前提下，在有限环境中，赤颈鹤种群拟合曲线总体较平缓，与观察种群曲线不重叠；2000 年，两曲线发生交叉。世代重叠前提下，在无限环境中，赤颈鹤种群拟合曲线与观察种群曲线在 1988-2000 年具有一定的同步性，但其波动不如观察种群明显；2000 年后，拟合种群曲线稳定，拟合种群大小显著高于观察种群大小。世代不重叠前提下，在无限环境中，赤颈鹤种群周限增长率平均值为 0.89，拟合种群曲线中，1992 年和 1996 年观察种群数量明显偏离拟合种群数量，其余年份间观察种群数量均围绕拟合种群曲线波动，总体呈现出一定的同步性。（3）鸟栈公园植物群落包括白千层、莲花、铺地黍－野生稻、荸荠属草、混合植物、水道（特指人工水渠）和水域（属于季节性地表积水）；其中，铺地黍－野生稻和白千层是优势植物群落，白千层植物群落面积与赤颈鹤种群数量呈显著负相关；而荸荠属草植物群落面积波动较大，与赤颈鹤种群数量呈显著正相关。（4）斑块类型水平和景观水平均影响赤颈鹤种群。其中，斑块类型水平上，赤颈鹤种群数量与荸荠属草面积、莲花的周长面积分维数以及混合植物的最大斑块指数呈显著或极显著正相关；与白千层面积及铺地黍－野生稻的散布与并列指数呈显著或极显著负相关。景观水平上，赤颈鹤种群数量只与周长面积分维数呈显著正相关。

进一步分析表明，1988-2000 年间，赤颈鹤观察种群在鸟栈公园受到环境资源有限性的阻力，并且环境阻力存在时滞效应；环境中的荸荠属草植物群落显著下降、白千层植物群落面积显著增加对赤颈鹤种群下降有影响。基于此，建议越南鸟栈国家公园根据需要对荸荠属草植物群落和白千层植物群落进行适当管理。

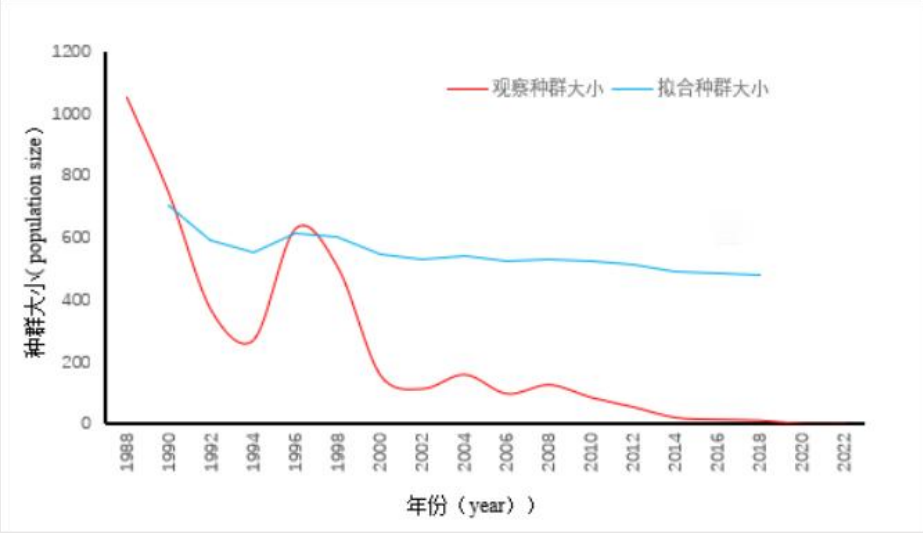

图 1. 鸟栈公园赤颈鹤种群世代重叠种群无限环境种群增长模型
Figure 1. Logistic model of population size of Sarus Crane in Tram Chim National Park

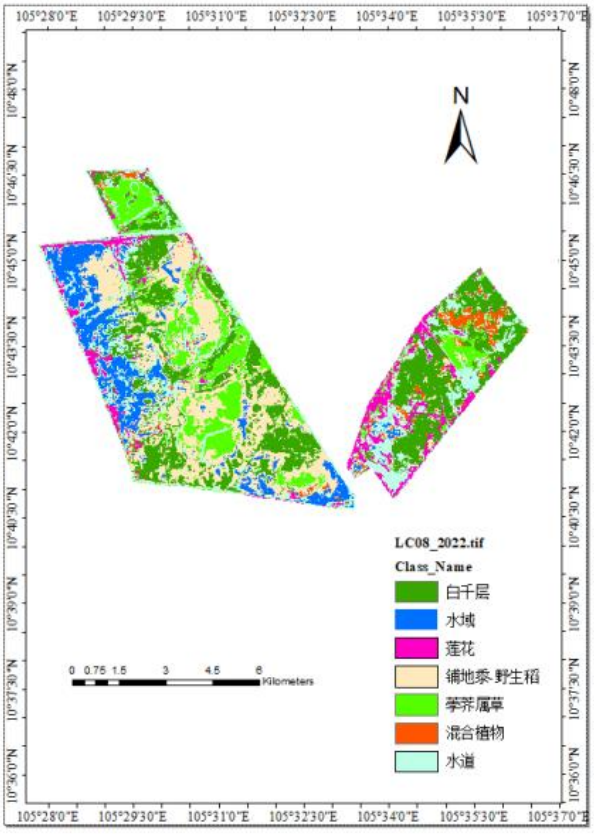

图 2. 鸟栈公园土地利用图（2022 年）
Figure 2. Tram Chim National Park Land Use Map (2022)

Population Growth Model and Landscape Characteristics Analysis of the Sarus Crane (*Grus antigone sharpii*) in Tram Chim National Park,Vietnam

NGO THI KIEU TRANG, HOU Jiayin, SONG Xilian, WU Qingming, ZOU Hongfei
Northeast Forestry University, Harbin 150040

Vietnam Tram Chim National Park is the main distribution site of Sarus Crane in Vietnam, and also a training site for captive Vietnam's Sarus Cranes before their reintroduction. However, it is not encouraging that the population of Sarus Cranes in this area has been declining since it was discovered in 1986. To determine causes for population decline of Sarus Cranes in Tram Chim National Park, this study examined issues from both intrinsic population growth and external landscape environment perspectives. Using logistic equations, the Malthusian model, and the logistic growth rates, the study fitted population growth models for Sarus Cranes in overlapping generations within a finite environment, in overlapping generations in an infinite environment, and in non-overlapping generations in an infinite environment. Furthermore, using Landsat remote-sensing imagery from 1988 to 2022, we analyzed how land-use types and landscape characteristics contribute to environmental resistance affecting population growth.

The results showed that: (1) The Sarus Crane population in Tram Chim National Park exhibited a continuous decline from 1988 to 2022, ultimately reaching zero. (2) Three population growth models were successfully fitted. Under the assumption of overlapping generations in a finite environment, the fitted population curve was relatively flat and did not overlap with the observed population curve; the two curves intersected in the year 2000. Under the assumption of overlapping generations in an infinite environment, the fitted curve showed a certain degree of synchrony with the observed curve from 1988 to 2000, although its fluctuations were less pronounced. After 2000, the fitted population stabilized and was significantly higher

than the observed population size. Under the assumption of non-overlapping generations in an infinite environment, the mean finite rate of increase was 0.89. In the fitted curve, the observed population sizes in 1992 and 1996 deviated markedly from the fitted values, whereas in other years the observed population fluctuated around the fitted curve, exhibiting an overall synchrony. (3) The plant communities and land covers in Tram Chim National Park include Melaleuca, Nelumbo, Panicum repens–Oryza, Eleocharis, mixed vegetation, water channels (artificial canals), and seasonal surface water. Among these, Panicum repens–Oryza and Melaleuca were the dominant plant communities. The area of the Melaleuca community was significantly negatively correlated with the Sarus Crane population size, whereas the area of the Eleocharis community exhibited large fluctuations and was significantly positively correlated with the crane population. (4) Both patch-type level and landscape-level metrics affected the Sarus Crane population. At the patch-type level, the crane population size was significantly or highly significantly positively correlated with the area of the Eleocharis community, the perimeter–area fractal dimension of Nelumbo, and the largest patch index of mixed vegetation. It was significantly or highly significantly negatively correlated with the area of the Melaleuca community and with the dispersion and adjacency indices of the Panicum repens–Oryza community. At the landscape level, the Sarus Crane population was significantly positively correlated only with the perimeter–area fractal dimension.

Further analysis indicates that between 1988 and 2000, the observed Sarus Crane population in Tram Chim National Park was subject to environmental resistance due to limited environmental resources, and this environmental resistance exhibited a time-lag effect. The significant decline in the Eleocharis plant community and the marked increase in the area of the Melaleuca plant community in the environment were found to contribute to the population decline of the Sarus Crane. Based on these findings, it is recommended that the Vietnam Tram Chim National Park implement appropriate management measures for the Eleocharis plant community and the Melaleuca plant community as needed to support the recovery of the crane population.

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萨哈（雅库特）共和国启动“白鹤迁徙”项目

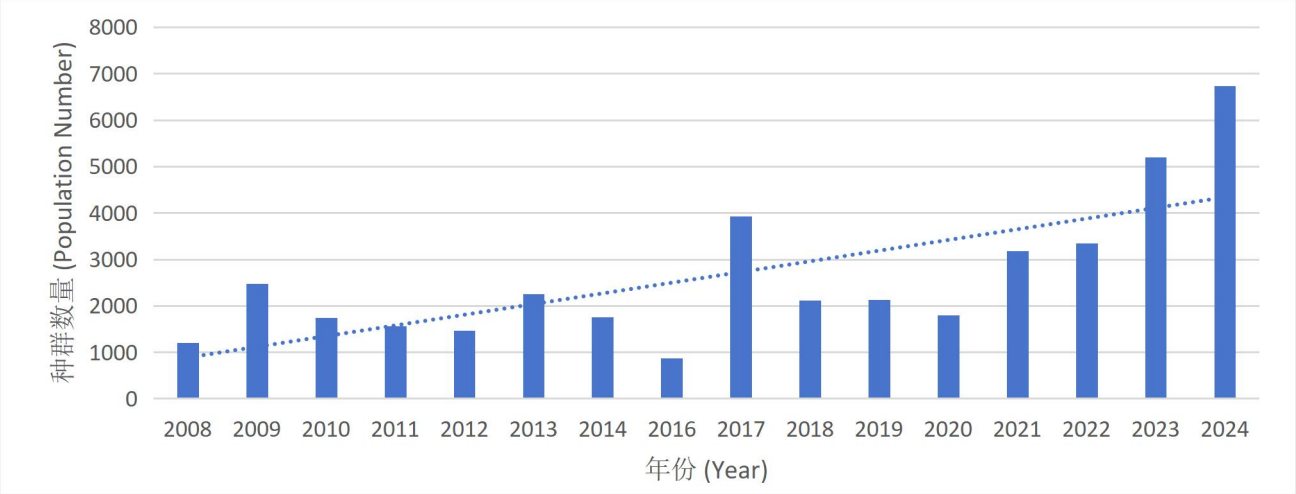
于倩
国际鹤类基金会，北京 100088

白鹤东部种群繁殖于俄罗斯萨哈（雅库特）共和国境内的克塔雷克国家公园，在长江中下游湿地越冬，集中于鄱阳湖流域。在东部种群的迁徙途中，阿尔丹河中游的奥霍茨克佩列沃兹（Okhotsky Perevoz）恰好处在迁徙通道收窄之地，超过 90%的白鹤东部种群经此在繁殖地和越冬地之间迁徙往返，该地是开展白鹤迁徙监测的理想地点。2024 年秋季，俄罗斯科学院西伯利亚分院冻土生物学问题研究所的科学家在奥霍茨克佩列沃兹监测到 6728 只迁徙白鹤（图 1）。

2024 年，为加强白鹤东部种群的研究与保护，萨哈（雅库特）共和国政府启动“白鹤迁徙”项目，在阿尔丹河右岸的奥霍茨克佩列沃兹村庄建立了访客中心，在阿尔丹河左岸的库奥卢马-查潘达地区资源保护区建立了观景平台、“白鹤之路”生态步道以及巡护员野外工作站（图 1-2）。

图 1. 白鹤东部种群秋季迁徙监测数据表

Figure 1. Numbers of Siberian Cranes recorded at Okhotsky Perevoz from the eastern population from 2008 – 2024 during fall migration.



数据来源：俄罗斯科学院西伯利亚分院冻土生物学问题研究所 Vladimirtseva Maria 博士

Data source: Dr. Maria Vladimirtseva, Institute of Permafrost Biology, Siberian Branch of the Russian Academy of Sciences.

2025 年 9 月 24-25 日，白鹤秋季迁徙开始之际，在奥霍茨克佩列沃兹举行了“阿尔丹河中游科学研究的现实意义与前景”专题研讨会、鸟类观测站与访客中心开幕式，鹤节等系列活动，萨哈（雅库特）共和国政府副主席奥尔加·巴拉布基娜、共和国生态自然管理与林业部副部长阿纳托利·阿列克谢耶夫、国际鹤类基金会东亚项目主任于倩、雅库特生物资源与特别自然保护区管理局副局长萨尔格拉拉娜·米哈伊洛娃、托姆蓬斯基区市政区代理负责人斯捷潘·克里沃沙普金，以及来自俄罗斯多家研究机构的科研人员、白鹤保护志愿者、当地社区居民参加了活动（图 3）。

9 月 24 日，“阿尔丹河中游科学研究的现实意义与前景”专题研讨会在访客中心新馆召开（图 4）。会议聚集了鸟类学、遗传学、病毒学、鱼类学、气候变化等多领域专家。研讨会期间各方达成共识，将组建东北亚鸟类研究国际工作组，并提出包含关键联合研究与保护倡议的决议文件。国际鹤类基金会东亚项目主任于倩介绍了基金会与中俄合作伙伴在白鹤东部种群保护取得的成果，呼吁共同推进候鸟迁徙路线的应用研究与保护实践。

9 月 25 日，开幕式在萨哈（雅库特）传统的阿尔吉斯仪式中拉开帷幕，访客中心前方竖起象征雅库特文化的拴马桩。典礼结束后，鹤节活动在访客中心举行，专家们为村中唯一一所学校的十名学生带来科普知识和互动游戏（图 5）。

萨哈（雅库特）共和国期望将访客中心和鸟类观测站打造成候鸟（特别是白鹤）迁徙路线上的长期监测与研究基地，持续在此开展鸟类环志和监测工作，并助力当地生态旅游产业发展。

图2. 白鹤之路生态步道（国际鹤类基金会摄）

Figure 2. Sighs along the "Siberian Crane Trail" . (Photo: International Crane Foundation)

图3. 阿尔丹河（国际鹤类基金会摄）

Figure 3. Workshop participants standing in front of Aldan River. (Photo: International Crane Foundation)

图4. 访客中心开幕式上雅库特传统宗教仪式Algy（国际鹤类基金会摄）

Figure 4. locals perform *Algy,* a traditional Yakut religious ritual at the visitor center opening ceremony. (Photo: International Crane Foundation)

图5. “阿尔丹河中游科学研究的现实意义与前景”专题研讨会（国际鹤类基金会摄）

Figure 5. The workshop “Relevance and Prospects of Scientific Research on the Middle Reaches of the Aldan River.” (Photo: International Crane Foundation)

图 6. 鹤节（国际鹤类基金会摄）

Figure 6. Crane Festival. (Photo: International Crane Foundation)

Launch of the "Siberian Crane Migration" Project in the Sakha (Yakutia) Republic

YU Qian
International Crane Foundation, Beijing 100088

The Eastern population of the Siberian Crane breeds in Kytalyk National Park in the Sakha (Yakutia) Republic of Russia and winters in the wetlands of the middle and lower Yangtze River Basin in China, with the majority concentrated in the Poyang Lake region. Along the migration route of this population, Okhotsky Perevoz village, located in the middle reaches of the Aldan River, lies precisely at a natural bottleneck of the flyway. More than 90% of the Eastern population passes through this site during both spring and autumn migrations between the breeding and wintering grounds, making it an ideal location for long-term monitoring of Siberian Crane migration. In autumn 2024, scientists from the Institute of Permafrost Biology , Siberian Branch of the Russian Academy of Sciences, recorded 6,728 migrating Siberian Cranes at Okhotsky Perevoz (Figure 1).

In 2024, to strengthen research and conservation efforts of the Eastern Siberian Crane population, the Government of the Sakha (Yakutia) Republic launched the "Siberian Crane Migration" Project. As part of this initiative, a visitor center was established on the right bank of the Aldan River in the village of Okhotsky Perevoz, and on the left river bank—an observation platform, a trail called "Siberian Crane Trail", and a ranger field station were constructed in the Kuoluma-Chapanda Regional Resource Reserve (Figures 1–2).

On 24–25 September 2025, as the autumn migration of Siberian Cranes got underway, a series of events was held in Okhotsky Perevoz, including the thematic workshop " Relevance and Prospects of Scientific Research on the Middle Reaches of the Aldan River," the opening ceremonies of the bird observatory and visitor center, and a Crane Festival. Participants included Olga Balabkina (Deputy Chair of the Government of the Sakha Republic), Anatolii Alekseev (Deputy Minister of Ecology, Natural Resource Management, and Forestry of the Republic), Yu Qian (East Asia Program Director, International Crane Foundation), Sargylana Mikhailova (Deputy Director, Yakutia Directorate of Biological Resources and Specially Protected Natural Areas), Stepan Krivoshapkin (Acting Head of the Tomponsky Municipal District), researchers from multiple Russian scientific institutions, crane conservation volunteers, and local community members (Figure 3).

On 24 September, the workshop "Relevance and Prospects of Scientific Research on the Middle Reaches of the Aldan River" was held in the newly opened visitor center (Figure 4). The event brought together experts in ornithology, genetics, virology, ichthyology, and climate change and other fields. During the workshop, all the Participants reached a consensus to establish an international working group for avian research in Northeast Asia and drafted a resolution outlining key collaborative research and conservation initiatives. Yu Qian shared the achievements made by International Crane Foundation and its Chinese and Russian partners in conserving the Siberian Crane Eastern population, and called on all parties to jointly advance applied research and conservation practices along migratory flyways.

On 25 September, the opening ceremony of the crane festival kicked off with the traditional Yakut Algys ritual, and a serge (a traditional Yakut tethering post) symbolizing local culture was erected in front of the visitor center. Following the ceremony, the Crane Festival took place at the visitor center, during which experts provided popular science knowledge and interactive educational games for ten students from the only school in the village (Figure 5).

The Government of the Sakha (Yakutia) Republic aims to develop the visitor center and bird observatory into a long-term monitoring and research hub along the migratory flyway—particularly for the Siberian Crane. It will support sustained bird banding and monitoring efforts here while boosting the development of local ecotourism.

黑颈鹤在中亚的首次记录

陈承彦
日本鸟类研究协会/日本野鸟协会，日本东京

2023 年 6 月 4 日，Andrew Spencer 在脸书上发布了一张黑颈鹤（*Grus nigricollis*）照片（图 1、2）。该照片拍摄于塔吉克斯坦帕米尔高原的阿利丘尔附近，这是该物种在中亚地区的首次记录，也是其在正常繁殖和越冬区之外的第二次记录。第一次这样的“区域外记录”是在 2020 年 6 月 13 日：一只未成年的黑颈鹤出现于蒙古国中北部布尔干省的呼塔格-温都尔（图 2、3）。当时这只黑颈鹤与两只未成年的灰鹤一起出现在色楞格河谷的草甸上（来源：www.essflyway.net）。

黑颈鹤主要在青藏高原繁殖，在中国西藏、云南、贵州三省，以及印度北部和不丹山地地区越冬。尽管该物种面临着全球变暖导致的栖息地丧失等威胁，但近年来的调查结果显示，其种群数量稳定并缓慢增长（全球黑颈鹤种群数量估计约为 1 万只，实际数量可能更高）。黑颈鹤长期被列为世界自然保护联盟（IUCN）濒危物种红色名录易危物种，2020 年被降级为近危物种。

The first record of the Black-necked Crane (*Grus nigricollis*) in Central Asia

SIMBA CHAN
Japan Bird Research Association / Wild Bird Society of Japan, Tokyo, Japan

On June 4, 2023, Andrew Spencer posted a photo of a Black-necked Crane taken near Alichur in the Pamir Mountains in Tajikistan on Facebook (Figures 1, 2). That was the first known record of this species found in Central Asia and the second outside breeding and wintering ranges. The first one was on June 13, 2020: one immature Black-necked Crane was seen in Khutag-Undur, Bulgan Province of Northcentral Mongolia (Figures 2, 3). The bird was together with two young Eurasian Cranes in the grassy meadow of the Selenga River Valley (www.essflyway.net).

The Black-necked Crane is a species breeding in the Tibetan Plateau and wintering in the mountains of Tibet, Yunnan, Guizhou (China), Northern India and Bhutan. Although it faces the threats from habitat loss due to global warming, census in recent years showed its population is stable or even slowly growing (the global population was estimated to be around 10,000 birds but could be higher). It has long been listed as a globally Vulnerable species but in 2020 it was downlisted as Near Threatened.

Figure 1. The Black-necked Crane in the Pamir Mountain in Tajikistan, June 4, 2023 (Photo by Andrew Spencer)
图 1. 2023 年 6 月 4 日，塔吉克斯坦帕米尔高原上的黑颈鹤（Andrew Spencer 摄）

Figure 3. The Black-necked Crane in Bulgan Province in Mongolia, June 13, 2020 (Photo by Iderbat Enkhtaivan)
图 3. 2020 年 6 月 13 日，蒙古国布尔干省的黑颈鹤（Iderbat Enkhtaivan 摄）

Figure 2. Sightings of the Black-necked Crane outside its range: ① -in Alichur, Tajikistan, ② -in Bulgan Province, Mongolia
图 2. 黑颈鹤在其正常分布范围之外的记录：① 塔吉克斯坦的阿利丘尔；② 蒙古国布尔干省

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森林砍伐导致全球鸟类数量下降

编译：杨文佳 审校：曾岩 英文作者：IUCN

本次IUCN红色名录更新包括对1,360种鸟类的重新评估，并完成了国际鸟盟（BirdLife International）对全球所有鸟类物种的第八次全面评估。这项历时九年、涉及数千名专家的工作显示，在评估的11,185个物种中，有1,256个受到全球性威胁。总体而言，61%的鸟类物种种群数量正在下降，这一估计值较2016年的44%有所上升。

鸟类种群下降最普遍的原因是由农业扩张和集约化以及伐木驱动导致的栖息地丧失和退化，这是鸟类濒危的首要威胁。

本次更新强调了马达加斯加、西非和中美洲等地的热带森林丧失对鸟类构成的日益增长的威胁。在马达加斯加，14种特有森林鸟类被升级至近危（NT），3种升级至易危（VU），其中包括雄鸟拥有鲜艳蓝绿色脸部肉垂的施氏裸眉鹟（Schlegel's Asity, *Philepitta schlegeli*）。在西非，五种物种被列为近危（NT），包括同时被猎杀和贸易的黑盔噪犀鸟（Black-casqued Hornbill, *Ceratogymna atrata*）。在中美洲，森林丧失已将北方那种上下摆尾的夜莺鹪鹩（Nightingale-wren, *Microcerculus philomela*）推至近危（NT）级别。

图 1. 施氏裸眉鹟(Bradley Hacker 摄)
Figure 1. Schlegel's Asity (*Philepitta schlegeli*) (Photo by Bradley Hacker)

国际鸟盟的全球科学协调员及鸟类红色名录权威评估协调员 Ian Burfield 博士表示：“世界上五分之三的鸟类物种种群数量在下降，这表明生物多样性危机在加重，各国政府履行其在多项公约和协议中制定的承诺并采取行动变得更加紧迫。罗德里格斯岛上原生森林栖息地的恢复，促使特有的罗岛苇莺（Rodrigues Warbler, *Acrocephalus rodericanus*）从 1996 年的极危（CR）成功恢复到今天的无危（LC），基于合作和毅力的付出已取得的成效。”

作为传粉者、种子传播者、害虫控制者、食腐动物和生态系统工程师，鸟类在生态系统和人类生存中扮演着重要角色，例如，某些犀鸟（hornbills）每天每平方公里可传播多达 12,700 颗大型种子，这极大支持了热带森林生态系统功能和碳储存。然而，农业、伐木、入侵物种、狩猎和诱捕以及气候变化仍持续对全球鸟类构成重大威胁。

Deforestation driving global bird declines

Compiled by: YANG Wenjia Reviewed by: ZENG Yan English Author: IUCN

This IUCN Red List update includes reassessments of 1,360 bird species and completes the eighth comprehensive assessment of all bird species worldwide by BirdLife International. Involving thousands of experts over nine years, 1,256 (11.5%) of the 11,185 species assessed are globally threatened. Overall, 61% of bird species have declining populations – an estimate that has increased from 44% in 2016.

The most prevalent cause of bird population declines is habitat loss and degradation, driven especially by agricultural expansion and intensification and logging – the foremost threats to birds at risk of extinction.

This update highlights Madagascar, West Africa, and Central America as regions where tropical forest loss poses a growing threat to birds. In Madagascar, 14 endemic forest bird species have been uplisted to Near Threatened and three to Vulnerable, including the Schlegel’s Asity (Philepitta schlegeli), whose males have vibrant blue and green face wattles. In West Africa, five species are now Near Threatened, including the Black-casqued Hornbill (Ceratogymna atrata), which is also hunted and traded. In Central America, forest loss has pushed the tail-bobbing northern Nightingale-wren (Microcerculus philomela) to Near Threatened.

“That three in five of the world’s bird species have declining populations shows how deep the biodiversity crisis has become and how urgent it is that governments take the actions they have committed to under multiple conventions and agreements,” said Dr Ian Burfield, BirdLife’s Global Science Coordinator (Species) and Bird Red List Authority Coordinator. “The restoration of native forest habitat on Rodrigues Island, facilitating the successful recovery of the endemic Rodrigues Warbler (Acrocephalus rodericanus) from Critically Endangered in 1996 to Least Concern today, shows what is possible through partnership and perseverance.”

Birds play vital roles in ecosystems and for people, serving as pollinators, seed dispersers, pest controllers, scavengers and ecosystem engineers. For example, hornbills can disperse up to 12,700 large seeds per km² each day, supporting ecosystem function and carbon storage in tropical forests. However, agriculture, logging, invasive species, hunting and trapping, and climate change continue to pose significant threats to birds globally.

【会议消息】
[News on Conference]

第十八届中国鸟类学大会在广西南宁成功举办

2025 年 10 月 23~27 日，第十八届中国鸟类学大会在广西大学成功举办。本届大会由中国动物学会鸟类学分会和 Avian Research 联合主办，广西大学林学院和动物科学技术学院承办，来自全国 34 个省、直辖市、自治区、香港和澳门特别行政区、台湾地区，以及美国、英国、俄罗斯、奥地利、瑞士、荷兰、澳大利亚、芬兰、日本、印度等国家近 1100 名代表齐聚广西南宁，共襄鸟类学研究的学术盛会。

本届大会以“喜迎中国鸟类学研究新百年”为主题，围绕科学研究、保护实践、技术创新等多个方向展开了广泛交流。大会安排了 6 场特邀大会报告、3 场特邀大会青年报告，设置了 28 场专题报告会（168 个报告）、7 场快速报告会（95 个报告）、7 场圆桌讨论，并展示了 112 份壁报。同时，邀请国家林草局 GEF 项目举办了一场“候鸟迁飞通道保护”的边会。大会共收录论文摘要 430 篇，来自 150 多家单位的代表在会上展示了最新研究成果。

本届大会的学术交流覆盖了鸟类学的众多研究领域与方向，既包括了鸟类演化、濒危物种保护、繁殖与生活史策略、群落生态与多样性格局等长期受到关注的优势方向，也涌现出多个近年来的前沿热点议题，如鸟类对气候变化的响应机制、鸟类肠道微生物、城市鸟类多样性、人工智能在鸟类监测中的应用、公民科学与自然教育等。在研究的鸟类类群方面，除雉类、鹤类、鸻鹬类、雀形目等传统热点类群继续涌现大量研究成果外，猛禽与海鸟研究也受到了日益广泛的关注。本届大会设立了中国海鸟专题报告会，这在中国鸟类学大会尚属首次。尤为可喜的是，中国鸟类学者的研究成果正持续加强与国家及区域发展战略和决策需求的对接，积极服务于国家生态文明建设及地方生态保护实践。此外，专题报告会还讨论了人鸟冲突评估与缓解策略、鸟类流行病与“同一健康”等新兴议题，展现了鸟类学者在这些领域的积极探索与思考。

本届大会在参会人数、参与单位及报告数量上均创下历史新高。大会学术报告涵盖领域广泛、整体水平高，既有鸟类学研究的新发现、受胁鸟类保护的新成果，也涌现出研究方法的创新，以及对传统理论和观点的重新审视与发展。在会议期间，与会代表积极投入，热烈交流，共享学术成果，碰撞思想火花，推动形成了更广泛、更深入的合作联系。这些成果充分呼应了“喜迎中国鸟类学研究新百年”的大会主题，也表明了一个百花齐放、蓬勃向前的鸟类学研究新局面的到来。10 月 26 日下午，大会在总结过去、展望未来的氛围中落下帷幕。大会宣布第十九届中国鸟类学大会将于 2027 年在云南昆明举办，诚邀全球学者共赴下一届鸟类学盛会。

The 18th China Ornithological Congress Successfully Held in Nanning, Guangxi

The 18th China Ornithological Congress was successfully held at Guangxi University from October 23 to 27, 2025. Jointly organized by the China Ornithological Society and Avian Research, and hosted by the College of Forestry and the College of Animal Science and Technology of Guangxi University, nearly 1,100 delegates from 34 provinces, autonomous regions, municipalities, Hong Kong and Macao Special Administrative Regions, Taiwan Region, as well as countries including the United States, United Kingdom, Russia, Austria, Switzerland, Netherlands, Australia, Finland, Japan, and India gathered in Nanning, known as the green city, to participate in this academic celebration of ornithological research.

This conference, featuring "Celebrating the New Century of Chinese Ornithological Research," facilitated extensive exchanges across multiple themes, including scientific research, conservation practices, and technological innovation. The program featured six invited plenary lectures, three invited young scientist presentations, 28 specialized sessions (168 presentations), seven rapid-fire sessions (95 presentations), seven roundtable discussions, and showcased 112 poster presentations. Additionally, a side event on "Migratory Bird Flyway Conservation" was organized by the GEF Project of the National Forestry and Grassland Administration. The conference collected 430 abstracts, with representatives from over 150 institutions presenting their latest research findings.

The academic exchanges at this conference covered numerous research fields and directions in ornithology, including not only long-standing and prominent areas that have received consistent attention, such as avian evolution, endangered species conservation, breeding and life-history strategies, and community ecology and diversity patterns, but also emerging cutting-edge topics in recent years—such as the response mechanisms of birds to climate change, avian gut microbiota, urban bird diversity, the application of artificial intelligence in bird monitoring, and citizen science and environmental education. In terms of the avian taxa under study, in addition to traditional hot groups like pheasants, cranes, plovers and sandpipers, and Passeriformes that continue to yield abundant research findings, studies on birds of prey and seabirds have gained growing attention. For the first time in the history of the China Ornithological Congress, a thematic symposium on Chinese seabirds was organized at this conference. Notably, the research achievements by Chinese ornithologists have been increasingly aligned with national and regional development strategies and decision-making needs, actively contributing to national ecological civilization construction and local ecological protection practices. Furthermore, the thematic symposia addressed emerging issues such as human-bird conflict assessment and mitigation strategies, avian epidemics and "One Health," demonstrating the proactive exploration and reflections of ornithologists in these fields.

This year's conference achieved record-high attendance, participating institutions, and presentations. The academic reports spanned a broad range of fields and maintained a high overall standard, featuring new discoveries in ornithological research, fresh achievements in threatened bird conservation, innovative research methodologies, and re-examination and development of traditional theories and perspectives. Throughout the conference, participants engaged enthusiastically, sharing academic achievements and sparking intellectual exchanges that fostered broader and deeper collaborative connections. These outcomes fully resonated with the conference theme of " Celebrating the New Century of Chinese Ornithological Research," signaling a new era of flourishing and dynamic ornithological studies. On the afternoon of October 26, the conference concluded in an atmosphere of reflecting on the past and looking toward the future. It was announced that the 19th Chinese Ornithological Congress will be held in Kunming, Yunnan in 2027, extending a warm invitation to scholars worldwide to join the next grand gathering of ornithology.

征稿启事

《中国鹤类通讯》是中国动物学会鸟类学分会和中国野生动物保护协会鹤类联合保护专业委员会联合主办的鹤类与水鸟信息交流的内部刊物，主要报道中国鹤类与水鸟的研究、保护、饲养、管理、宣传和教育等工作的动态和阶段成果，也报道国外鹤类研究动态及其他水鸟有关信息，欢迎同行及各界人士踊跃投稿。

来稿要求：（1）仅接收电子稿件，接收电子邮箱：cranenews@163.com，投稿时-需注明联系电话、电子邮箱和“中国鹤类通讯稿件”字样。无电子版稿件恕不接收；（2）字数以 500－1,000 字为宜，希勿超过 2000 字；（3）内容简明扼要，报道的鹤类和水鸟新地点请给出经纬度；（4）来稿文责自负。本刊对决定刊用的文稿可作文字修改、删节；凡涉及对作者原意的修改，则提请作者考虑；（5）文内写明作者姓名、工作单位；（6）来稿可只用中文，由本刊负责译成英文。

截稿日期为每年 4 月 20 日和 10 月 20 日。

《中国鹤类通讯》为彩色封面，欢迎提供鹤类及水鸟的高质量彩色照片，同时欢迎各自然保护地等单位提供介绍性稿件和照片（封 2－3）。

本刊为半年刊，每年 6 月和 12 月出版，出版后上传至中国动物学会鸟类学分会网页（http://www.chinabird.org），供免费下载。

Instructions for Contributors

China Crane News is published by China Ornithological Society and United Crane Conservation Committee of China Wildlife Conservation Association. The newsletter specializes in the exchange of information on cranes and other large waterbirds, focusing on research, conservation, breeding, management, and education activities related to these species in China, and also reports relevant information abroad.

Submission guidelines:

(1) The article should be submitted electronically to: cranenews@163.com.
(2) The article should be no more than 1,000 words.
(3) The article should be concise and include geographic coordinate information for new sighting sites of cranes and other waterbirds.
(4) The author’s name, organization, and address should be included at the end of the article.
(5) The article can be submitted in Chinese or English, although both English and Chinese are preferred.
(6) Deadlines for manuscripts are April 20 and October 20 each year.
(7) The author takes full responsibility for the content of the article.

This newsletter is a semi-annual publication, published in June and December each year. The newsletter can be downloaded free at China Ornithological Society website: http://www.chinabird.org.