中国鹤类通讯

CHINA CRANE NEWS

2025 年 第 25 卷 第 1 期（总第 41 期）
Vol. 25, No. 1, 2025

中国动物学会鸟类学分会
China Ornithological Society

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

目 录

Contents

【鹤类科研与监测】
[Crane Research and Monitoring]

辽河口国家级自然保护区丹顶鹤人工种群遗传资源库和遗传谱系构建

李楠[1] 李玉祥[2] 于长斌[2] 赵仕伟[2] 李东来[1]
1 辽宁大学生命科学学院，沈阳 110036
2 盘锦市林业和湿地保护服务中心，辽宁盘锦 124010

丹顶鹤是我国国家一级重点保护野生动物，被世界自然保护联盟（IUCN）红色名录列为易危（VU）物种。我国野生丹顶鹤种群数量一直不高。把人工饲养种群进行野化放归，可提高野生种群的数量，是维系和挽救中国丹顶鹤种群的重要举措之一。当前，我国已建立多个丹顶鹤繁育基地，人工种群数量不断增加。但人工繁育种群的遗传多样性水平和遗传谱系不清，不利于丹顶鹤人工繁育工作的科学管理。

本研究于 2024 年对辽河口国家级自然保护区鹤类繁殖基地的种鹤和 1~2 岁龄幼鹤采集血样，构建遗传资源库，评估种鹤之间的亲缘关系和遗传多样性。本研究共计采集 162 份丹顶鹤血样，其中种鹤 60 只。所有样品均保存在辽宁大学生命科学学院鸟类学研究室，并对每只个体建立了完整的生物学信息档案。

遗传分析运用微卫星和线粒体 Cyt b 基因分型。结果表明，该保护区丹顶鹤人工种群的遗传多样性处于中等水平，但单倍型多样性稍低。另外，构建了 162 只丹顶鹤个体的完整亲缘谱系图（图 1），每对种鹤的后代数量为 1-11 只，平均 4 只。对 30 对种鹤遗传谱系分析发现，多数种鹤繁殖对之间不存在近亲繁殖关系，但约一半的种鹤来自人工繁育的后代。

该研究为丹顶鹤的遗传资源保护和人工种群的遗传管理提供了科学数据，对即将开展的野化放归工作，包括种源选择、遗传多样性评估和野化放归种群监测具有重要参考价值，也对其他鹤类繁育基地的遗传资源库建设和谱系建设有一定借鉴意义。

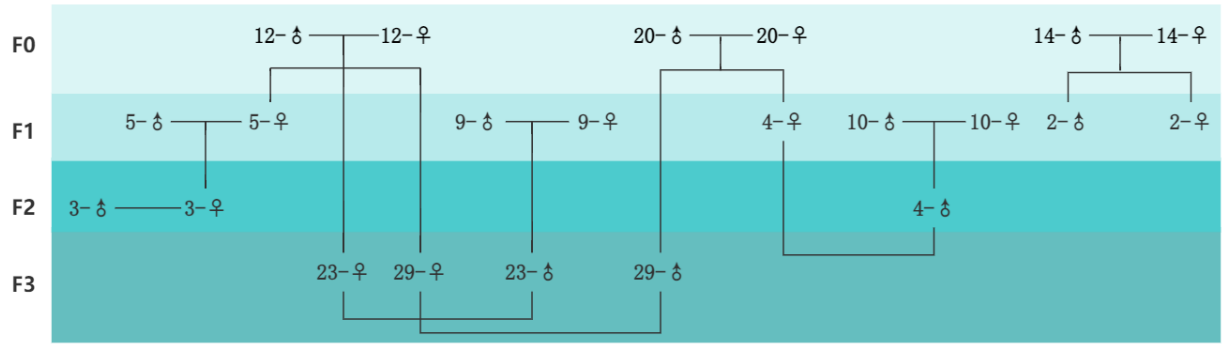


图 1. 辽河口鹤类繁育基地部分丹顶鹤种鹤的遗传谱系图（数字代表笼舍编号）
Figure 1. Relationship of some breeders and their offsprings of Red-crowned Cranes captive at Liaohekou National Nature Reserve (note: crane numbers are indicated by their cage numbers)

Establishing Genetic Bank and Studbook of Red-crowned Cranes Captive at Liaohekou National Nature Reserve, Liaoning

Li Nan[1], Li Yuxiang[2], Yu Changbin[2], Zhao Shiwei[2], Li Donglai[1]
1 School of Life Sciences, Liaoning University, Shenyang 110036
2 Panjin Forestry and Wetland Conservation Center, Panjin, Liaoning 124010

Red-crowned crane is a Class I protected wildlife in China and is listed as vulnerable (VU) in the IUCN Red List. The wild population of the Red-crowned Cranes has been low over the past several decades in China. Releasing

captive birds into wild can increase the wild population and is one of the important measures to maintain the long-term survival of the population of Red-crowned Cranes in China. At present, there are several Red-crowned Crane breeding facilities established, and the number of the captive birds is increasing. However, their studbook is not well maintained, and genetic diversity is unclear, making it hard for effective management of captive breeding of the Red-crowned Cranes.

In 2024, we collected blood samples from the captive crane breeders and 1-2 year-old young birds at Liaohekou National Nature Reserve, to construct a genetic bank and evaluate their genetic relationship and diversity among the captive cranes. A total of 162 blood samples of Red-crowned Cranes were collected in this study, including from 60 breeders. All samples were stored in the Ornithology Laboratory of the School of Life Sciences at Liaoning University, and a complete biological information archive was established for each individual bird.

Microsatellite and mitochondrial Cyt b genotyping were used in the genetic analysis. The results from the analysis indicate the genetic diversity of the captive Red-crowned Cranes at the reserve was at a medium level, but the haplotype diversity was slightly lower. In addition, a studbook for these 162 cranes was established (Figure 1). The number of offsprings of each pair of crane breeders was 1-11, with an average of 4. In addition, the genetic pedigree analysis from 30 pairs of crane breeders found that there was no inbreeding among them, but about half of the crane breeders came from artificially bred offsprings.

This study provides valuable information for the protection of Red-crowned Crane genetic resources and the genetic management of the captive population. It has important value for the future reintroduction into the wild, including breeder selection, genetic diversity assessment and monitoring of reintroduced populations, also significant for similar reintroduction programs in other crane breeding facilities.

****

Results of the International Red-crowned Crane Censuses in Winter 2023/2024*

Yulia.S. Momose, Kisup Lee, Kunikazu Momose, Fawen Qian
International Red-crowned Crane Network

Since the establishment of the International Red-crowned Crane Network (IRCN) in 2009, a range of countries have conducted annual winter censuses to monitor both continental and island populations of this species. To estimate the global population of the Red-crowned Crane, all regional networks (IRCN-China, IRCN-Korea, and IRCN-Japan) have conducted censuses independently. To estimate the continental population, IRCN-China conducted the 2023/2024 winter censuses at wintering sites in Yancheng, Yellow River Delta, and Liaohe Kou National Nature Reserves in China and IRCN-Korea in Cheorwon, Yeoncheon, Ganghwa, and Paju, located near the demilitarized zone (DMZ) in the Republic of Korea. IRCN-Japan estimated the island population of this species in Hokkaido, Japan.

The results from the 2023/2024 winter censuses show that the global population remains virtually unchanged at 4,884 individuals, compared to 4,914 individuals during the winter of 2022/2023 (Momose et al., 2024). Both island and continental populations are stable as well. In Japan, 1,800 individuals were counted in the winter of 2023/2024, down from 1,850 individuals in the winter of 2022/2023. In China and South Korea, 818 and 2,266 individuals (3,084 total for the continental population) were counted during the winter of 2023/2024, respectively, compared to 841 and 2,223 individuals (3,064 total) in the winter of 2022/2023 (Momose et al., 2024). Results of international winter counts since 2011/2012 have been published in previous issues of the Flint Crane Working Group of Eurasia (CWGE) Newsletter (Momose et al., 2013, 2018, 2022, 2023, 2024).

Literature cited:

Momose Y.S., Qian F., Momose K., Lee K. 2013. The Inter-national Winter Census of the Red-crowned Crane in 2011/2012 and 2012/2013. Newsletter of Flint Crane Working Group of Eurasia 12:63-64.

Momose Yu., Lee K., Momose K., Qian F. 2018.The International Winter Census of the Red-crowned Crane from 2013 to 2017. Newsletter of Flint Crane Working Group of Eurasia 14:66-67.

Momose Y.S., Lee K., Momose K., Qian F.2022. The International winter censuses of the Red-crowned Crane from 2018/2019 to 2020/2021. Newsletter of Flint Crane Working Group of Eurasia 16:77-78.

Momose Y.S., Lee K., Momose K., Qian F. 2023. The International censuses of the Red-crowned Crane in

*Original article was published in Newsletter of Flint Crane Working Group of Eurasia. 2025. #19.

winter 2021/2022. Newsletter of Flint Crane Working Group of Eurasia 17:99.
Momose Y.S., Lee K., Momose K., Qian F. 2024. The International censuses of the Red-crowned Crane in winter 2022/2023 (94–95). Newsletter of Flint Crane Working Group of Eurasia 18:94-95.

2023/2024 年冬季全球丹顶鹤调查结果*

Yulia.S. Momose　Kisup Lee　百瀬邦和 钱法文
国际丹顶鹤保护网络

自 2009 年国际丹顶鹤网络（IRCN）成立以来，许多丹顶鹤分布国开展了冬季丹顶鹤普查，以监测丹顶鹤的大陆和岛屿种群。为了估计丹顶鹤的全球种群数量，该网络的每个区域网络，即 IRCN-中国、IRCN-韩国和 IRCN-日本，分别做了丹顶鹤种群调查。为了评估 2023/2024 年冬季丹顶鹤大陆种群，IRCN-中国在盐城、黄河三角洲和辽河口国家级自然保护区的越冬地进行了冬季调查，IRCN-韩国在南北朝鲜非军事区附近的铁原、涟川、江华和坡州进行了普查。IRCN-日本调查了该物种在北海道的岛屿种群数量。

2023/2024 年冬季丹顶鹤调查结果为 4,884 只，与 2022/2023 年冬季数量 4,914 人相比（Momose et al，2024），全球丹顶鹤数量几乎保持不变。丹顶鹤岛屿和大陆种群都很稳定。在日本，2023/2024 年冬季数量为 1,800 只，略低于 2022/2023 年冬季的 1,850 只。在中国和韩国，2023/2024 年冬季分别有 818 只和 2,266 只（大陆种群总数为 3,084 只），而 2022/2023 年冬季有 841 只和 2,223 只（总数为 3,064 只）（Momose et al，2024）。自 2011/2012 年以来，国际丹顶鹤冬季种群的调查结果都已在 CWGE 通讯中发表（Momose et al，2013，2018，2022，2023，2024）。

参考文献【见原文】

****

若尔盖繁殖期黑颈鹤食性和肠道微生物研究进展

马瑞丰 朱英
西南民族大学，四川成都 610225

黑颈鹤（*Grus nigricollis*）是高原特有珍稀候鸟，其生存状况及种群动态备受关注。繁殖期是黑颈鹤种群延续的关键阶段。基于 16S rRNA 测序技术、食物宏条形码技术以及宏基因组技术，我们近两年开展了繁殖期黑颈鹤对环境的适应性研究，以下是主要的研究结果。

1. 不同季节黑颈鹤的无脊椎动物食物组成特征

我们使用无脊椎动物特异性引物 ANML（LCO1490 和 CO1-CFMRa）对 4 月和 9 月黑颈鹤食物组成进行鉴定，共鉴定出 38 个节肢动物属，其中大蚊属（*Tipula*）为优势类群。迟眼蕈蚊属（*Bradysia*）、异环足摇蚊属（*Acricotopus*）等 20 个属以及按蚊属（*Anopheles*）、雏蝗属（*Chorthippus*）等 16 个属分别仅在 4 月和 9 月检出。黑颈鹤在 4 月的摄食多样性和生态位宽度高于 9 月（Ma et al., 2024）。

2. 不同季节黑颈鹤肠道微生物与动植物食物的关系

基于食物宏条形码（COI/RbcL 基因）和肠道微生物组（16S rRNA/宏基因组）分析发现，黑颈鹤肠道微生物多样性、结构与植物源食物多样性、结构成显著正相关关系，植物-微生物互作网络复杂度高于动物-微生物网络，植物源食物对肠道微生物的影响高于动物源食物。在代谢功能适应性策略方面，4 月黑颈鹤肠道微生物会富集氨基酸、叶酸及脂质代谢途径，可能与繁殖期前营养需求有关；9 月则会转向富集碳水化合物代谢，可能为长距离飞行提供能量准备（Ma et al., 2025）。

* 原文标题和来源: Results of the International Red-crowned Crane Censuses in Winter 2023/2024. Newsletter of Flint Crane Working Group of Eurasia. 2025. 19:89-90.

图 1. 繁殖期黑颈鹤正在采食（安多 摄）
Figure 1. A Black-necked Crane eating an animal during breeding season (Photo by An Duo)

3. 黑颈鹤年周期肠道微生物的季节性动态

基于若尔盖黑颈鹤四个季节的粪便样品，并结合线上数据库越冬期肠道微生物数据，系统解析了黑颈鹤肠道微生物季节动态变化特征。研究发现，除夏季之外，乳酸菌科（Lactobacillaceae）在黑颈鹤肠道菌群中占据优势地位。季节显著影响黑颈鹤肠道微生物多样性，夏季黑颈鹤肠道微生物相较于繁殖期其他季节有着更高的 α 多样性和 β 多样性。中性模型与零模型分析显示，扩散限制作用是影响肠道微生物构建的主要驱动因素（Zhang et al., 2025）。

以上研究表明，黑颈鹤通过动态调整食物结构以适应季节性环境变化，这一适应性行为与其肠道微生物群落的调节功能密切相关，二者共同协助宿主应对环境变化。未来可建立黑颈鹤全周期监测体系，结合迁徙途经点的肠道微生物组和食性数据，阐明饮食-微生物互作的时空变化规律，以深入理解黑颈鹤的高原迁徙适应机制，为科学保护提供理论支撑。

参考文献：

Ma, Ruifeng, Shujuan Ma, Hongyi Liu, Lei Hu, Yudong Li, Ke He, Ying Zhu. 2024. Seasonal changes in invertebrate diet of breeding black-necked cranes (*Grus nigricollis*). Ecology and Evolution. 14: e70234.

Ma, Ruifeng, Shujuan Ma, Yujia Zhang, Lei Hu, Keyi Tang, Hongyi Liu, Ke He, Yudong Li, Suolangduoerji, Ying Zhu. 2025. Flexible host–microbe interaction aid adaptation of black-necked crane to seasonal shifts. Global Ecology and Conservation. e03458.

Zhang Y, Ma R, Suolangduoerji, Ma S, Nuertai A, He K, Liu H, and Zhu Y. 2025. Annual cycle variations in the gut microbiota of migratory black-necked cranes. *Front. Microbiol*. 16:1533282. doi: 10.3389/fmicb.2025.1533282.

Research update on the diet and gut microbiota of Black-necked Cranes breeding at Ruoergai, Sichuan

Ma Ruifeng & Zhu Ying
Southwest Nationalities University, Chengdu 610225

The Black-necked Crane (*Grus nigricollis*) is a rare and endemic migratory bird species of the high plateau, and its survival and population have received significant attention. The breeding season is a critical period of the life cycle of this species. Based on 16S rRNA sequencing, dietary DNA metabarcoding, and metagenomic techniques, we studied environmental adaptability of Black-necked Cranes breeding at Ruoergai of Sichuan Province in the past two years. Below are the key research findings.

1. Seasonal variation in invertebrate prey composition of Black-necked Cranes

We used invertebrate-specific primers ANML (LCO1490 and CO1-CFMRa) to analyze the dietary composition of Black-necked Cranes in April and September. A total of 38 arthropod genera were identified,

with *Tipula* being the dominant taxon. Twenty genera, including *Bradysia* and *Acricotopus*, were exclusively detected in April, while sixteen other genera, such as *Anopheles* and *Chorthippus*, were found only in September. The dietary diversity and niche breadth of Black-necked Cranes were significantly higher in April than in September (Ma et al., 2024).

2. Relationship between gut microbiota and plant-animal dietary in Black-necked Cranes across seasons

Food DNA metabarcoding (COI and RbcL genes) and gut microbiome analysis (16S rRNA sequencing/metagenomics) revealed that the diversity and composition of the Black-necked Crane's gut microbiota were significantly positively correlated with the diversity and composition of plant-derived food sources. The plant-microbe interaction network exhibited higher complexity than the animal-microbe network, indicating that plant-based diets exert a stronger influence on gut microbiota than animal-based diets. Regarding metabolic functional adaptations, the gut microbiota in April was enriched with pathways related to amino acid, folate, and lipid metabolism, potentially supporting pre-breeding nutritional demands. In contrast, September showed a shift toward carbohydrate metabolism, likely preparing energy reserves for long-distance migration (Ma et al., 2025).

3. Seasonal dynamics of gut microbiota in Black-necked Cranes across annual cycle

Based on fecal samples from the Black-necked Cranes in the Ruoergai region across four seasons, combined with online database of gut microbial data from the wintering period, we systematically analyzed the seasonal dynamics of the gut microbiota in Black-necked Cranes. We found that, except in summer, Lactobacillaceae dominated the gut microbial community of Black-necked Cranes. Season significantly influenced the diversity of the gut microbiota, with higher α-diversity and β-diversity observed in summer compared to other seasons during the breeding period. Neutral model and null model analyses revealed that dispersal limitation was the primary driver shaping the gut microbial assembly (Zhang et al., 2025).

The above research indicates that Black-necked Cranes dynamically adjust their dietary structure to adapt to seasonal environmental changes. This adaptive behavior is closely related to the regulatory function of their gut microbiota, with both working synergistically to help the host cope with environmental fluctuations. In the future, a comprehensive monitoring system for Black-necked Cranes could be established, integrating gut microbiome and dietary data from migratory stopover sites. This would help clarify the spatiotemporal patterns of diet-microbiome interactions, further elucidating the high-altitude migration adaptation mechanisms of Black-necked Cranes and providing a theoretical foundation for their scientific conservation.

References (see original Chinese article)

****

宜昌多地发现国家二级保护动物——灰鹤

舒仁庆
宜昌市林业和园林局，湖北宜昌 443000

2025 年 2 月底到 3 月初，宜昌远安沮河湿地公园监测到近千只灰鹤过境。宜昌观鸟爱好者服务中心也反映，在三峡坝区截流纪念园附近的草坪上，经常见到三三两两的灰鹤停歇。2 月 28 日，市林业和园林局组织专家与三峡坝区园林管护中心工作人员前往现场调查，目击 3 只灰鹤在草坪上觅食。据该园林管护工作人员介绍，近段时间经常可以看到这种大鸟在草坪上停歇觅食，几天后飞走了，之后又飞来几只，从大小和颜色看不是同一群。

图 1. 在远安沮河湿地公园拍摄的成群飞行的灰鹤（舒仁庆 摄）
Figure 1. Eurasian Cranes flying over Yuan'anju River Wetland Park, Yichang of Hubei Province (Photo by Shu Renqing)

图 2、3. 在三峡坝区截留纪念园附近拍摄的国家二级保护动物--灰鹤（舒仁庆 摄）
Figures 2&3. Eurasian Cranes foraging on the lawn at the Three Gorges Dam Memorial Park, Yichang of Hubei Province (Photos by Shu Renqing)

据华中农业大学李翔教授介绍，宜昌地处鄂西水鸟迁徙通道，北迁的灰鹤种群会从宜昌上空经过，一般不会停歇。只有因为天气或者是幼鹤体力不支等原因，才会有中途停歇的现象，停歇地一般属于生态环境好，适宜栖息的区域。灰鹤在鄱阳湖和洞庭湖等南方区域越冬，在我国的内蒙、新疆、东北和俄罗斯西伯利亚等地繁殖。

《湖北省鸟类图志》记载，灰鹤在湖北宜昌属于冬候鸟，主要栖息在河流、湖泊、水库和海岸附近，常到农田里觅食，以植物为主，包括根、茎、叶、果实和种子。灰鹤的大量出现，展现了宜昌生态环境的持续改善。宜昌市林业和园林局加强对鸟类迁徙通道区域的监测，对一些重要鸟类停歇地采取精准保护措施，让更多像灰鹤这样的珍稀动物在宜昌留下美丽身影，为城市的生态画卷增添绚丽色彩。

Eurasian Cranes sighted in Yichang, Hubei

Shu Renqing
Yichang Forestry and Park Bureau, Hubei 443000

It was learned from the Yichang Forestry and Park Bureau that from the end of February to the beginning of March 2025, nearly a thousand Eurasian Cranes were sighted passing through the Yuan'anju River Wetland Park, Yichang, Hubei Province. Local bird watchers also reported that Eurasian Cranes were often seen resting in groups of two or three on the lawn at Memorial Park near the Three Gorges Dam. On February 28, three Eurasian Cranes were seen foraging on the lawn by experts organized by the forestry and park bureau and staff members from the Three Gorges Dam Landscaping Center. According to the landscaping center staff, these large birds were often seen resting and foraging on the lawn recently. They flew away and a few more came in. Judging from the size and color of these birds, these birds were most likely not from the same group.

According to Professor Li Xiang of Central China Agricultural University, Yichang is in a migratory flyway of waterbirds in western Hubei Province. Eurasian Cranes migrating northward normally pass over

Yichang and do not stop. These birds would only stop midway due to bad weather or when the young cranes are physically exhausted. The stopover areas are generally with a good ecological environment and suitable habitats. Eurasian Cranes winter in southern areas such as Poyang Lake and Dongting Lake, and breed in Inner Mongolia, Xinjiang, Northeast of China, and Siberia of Russia.

According to the Hubei Birds Book, Eurasian Crane is a wintering bird species in Yichang of Hubei. They mainly move near rivers, lakes, reservoirs and shores. They often go to farmlands to forage for food, mainly plant roots, stems, leaves, fruits and seeds. The large-scale sightings of Eurasian Cranes this winter show the continuous improvement of Yichang's ecological environment. The Yichang Forestry and Park Bureau has strengthened the monitoring of migratory birds and taken better protection measures for some important bird stopovers, so that more wildlife like Eurasian Crane can stay in Yichang.

****

向海国家级自然保护区 2020-2024 年鹤类种群动态分析

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

吉林向海国家级自然保护区（以下简称向海保护区）位于吉林省通榆县西北部，其地理位置在东经 122°05′-122°35′，北纬 44°50′-45°19′之间，北部与洮南市相邻，西部与内蒙古自治区科右中旗接壤，总面积 105,467 公顷。向海保护区地处东亚-澳大利西亚鸟类迁徙通道上，此通道是全球 9 条迁徙通道最重要的一条。向海保护区凭借它的地理优势，迁徙水鸟及候鸟种类繁多，其中鹤类有六种，包括国家一级保护动物丹顶鹤、白鹤、白枕鹤、白头鹤，国家二级保护动物灰鹤、蓑羽鹤，其中丹顶鹤、白枕鹤、蓑羽鹤在向海保护区有繁殖种群。

2020-2024 年，向海保护区 5 种鹤类种群数量均有不同程度的上升和下降，其中白鹤种群数量常年维持在 500 只以上，春季监测到的白鹤种群数量明显少于秋季。近三年来，白鹤在向海保护区种群数量明显增加，在 2024 年达到顶峰，种群数量达到了 3,472 只，约占世界种群的一半（图 1）。

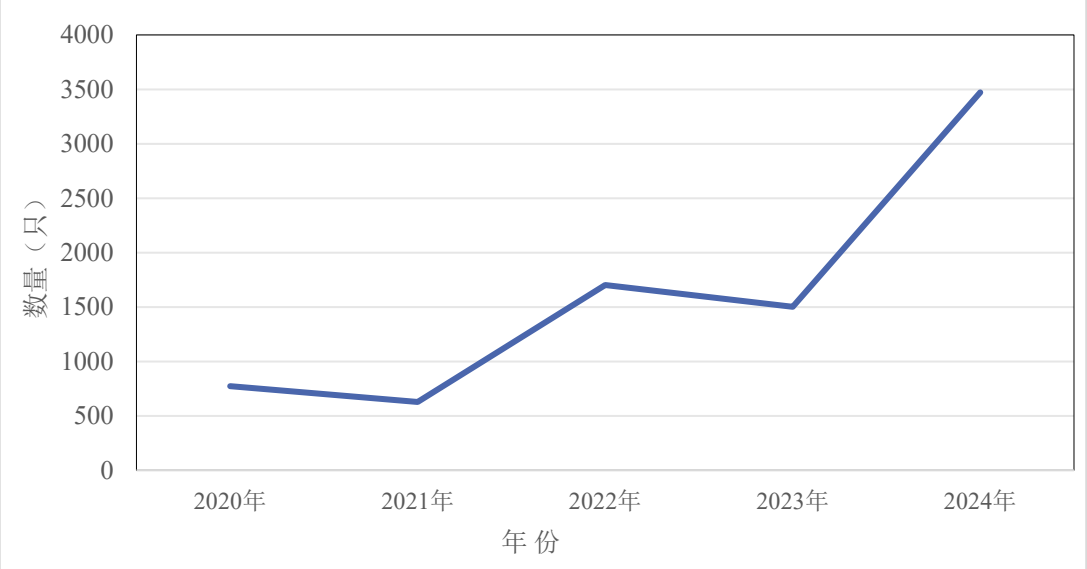


图 1. 2020-2024 年白鹤种群数量变化趋势
Figure 1. Number of Siberian Cranes recorded at Xianghai from 2020-2024

向海保护区的白枕鹤种群数量较少，主要栖息在付老文泡、同发滚水坝、大肚泡等地。白枕鹤种群数量在 2021 年达到峰值，共有 68 只，但在 2022 年又骤减到 13 只。2023 年、2024 年情况好转，分别监测到 50 只、47 只，并在 2023-2024 年连续两年在向海保护区境内监测到白枕鹤繁殖（图 2）。

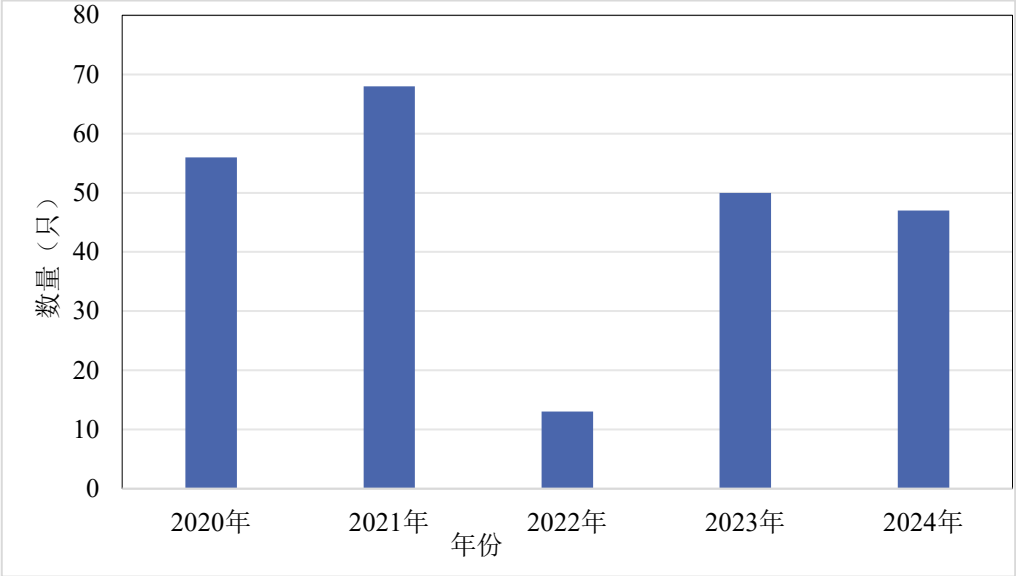


图 2. 2020-2024 年白枕鹤种群数量变化趋势
Figure 2. Number of White-naped Cranes recorded at Xianghai from 2020-2024

白头鹤在向海保护区一直有一定数量分布，主要分布在鹤类核心区东部的海力营子、超生屯、福泰泡周围的草甸和农田中，秋季数量相对较多。向海保护区白头鹤种群数量最高记录为 3,764 只，记录年份为 2020 年。2021 年，白头鹤种群数量骤减到 1,225 只，2022 年有所增加达到 2,078 只，但之后三年的监测发现白头鹤种群数量连续下降，并在 2024 年减少到 847 只（图 3）。

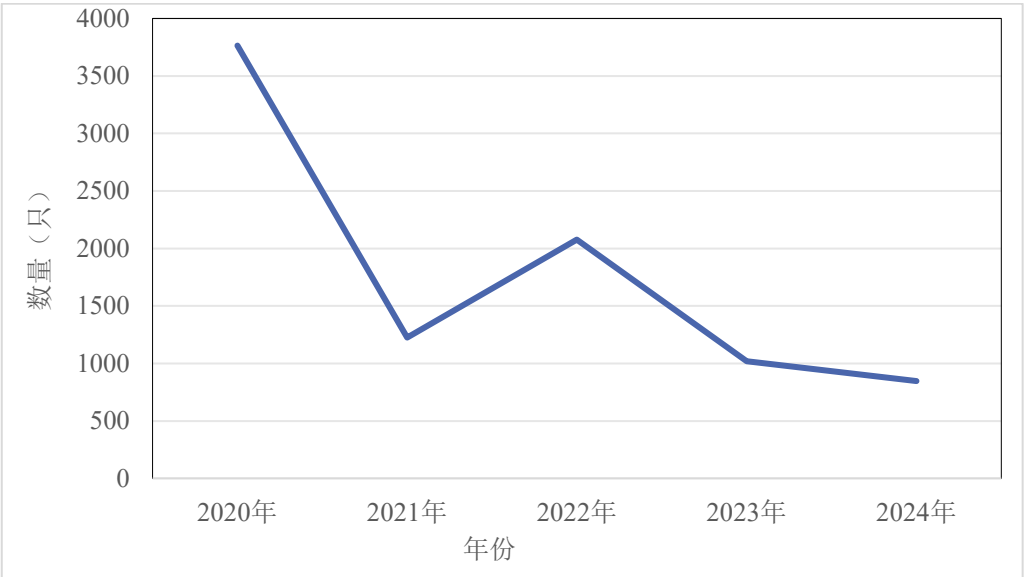


图 3. 2020-2024 年白头鹤种群数量变化趋势
Figure 3. Number of Hooded Cranes recorded at Xianghai from 2020-2024

灰鹤是向海保护区鹤类种群数量最多的一种，监测到灰鹤种群数量最高记录为 12,640 只，记录时间为 2022 年。灰鹤种群数量比较多变，2021 年对比 2020 年下降，种群数量分别为 4,974 只、8,028 只；2022 年对比 2021 年上升，种群数量分别为 12,640 只、4,974 只；2023 年对比 2022 年下降，种群数量分别为 3,989 只、12,640 只；2024 年对比 2023 年上升，种群数量分别为 10,851 只、3,989 只（图 4）。

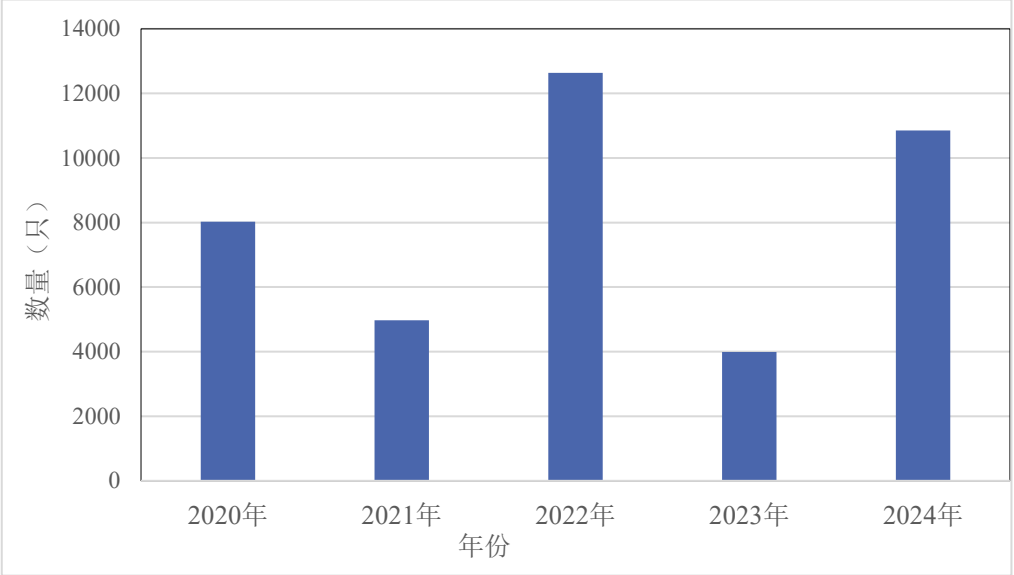


图 4. 2020-2024 年灰鹤种群数量变化趋势
Figure 4. Number of Eurasian Cranes recorded at Xianghai from 2020-2024

丹顶鹤是向海保护区最宝贵的一种鹤类，向海也因为丹顶鹤被誉为“鹤乡”。近些年，丹顶鹤主要栖息地在青年坝、付老文泡、碱地泡附近，其次是韩家烧、海力营子附近草甸子。监测到丹顶鹤种群数量最多的一年是 2021 年，为 69 只，其余年份种群数量维持在 20～42 只之间（图 5）。

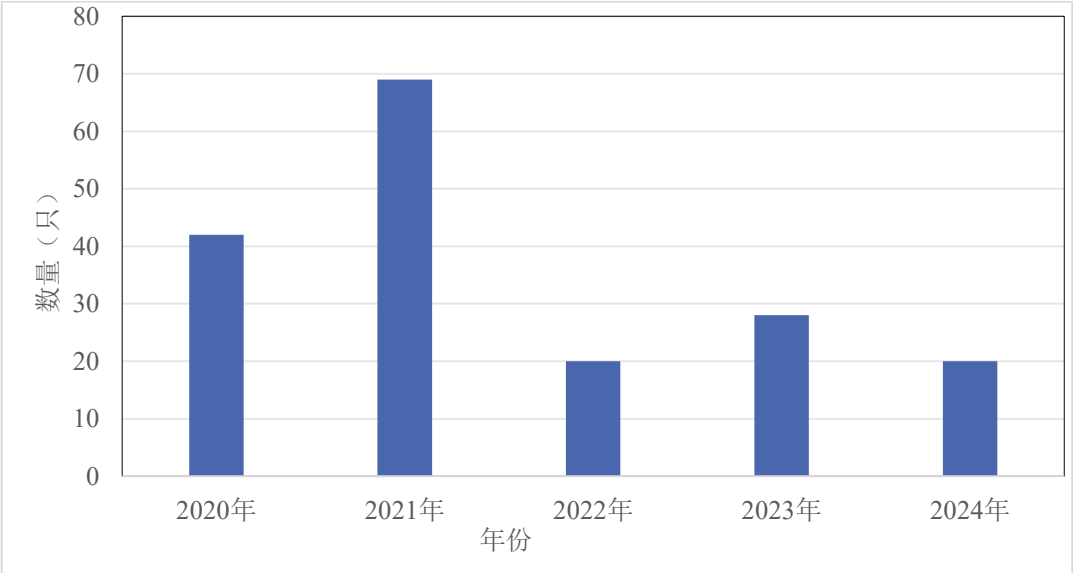


图 5. 2020-2024 年丹顶鹤种群数量变化趋势
Figure 5. Number of Red-crowned Cranes recorded at Xianghai from 2020-2024

Numbers of cranes at Xianghai Nature Reserve from 2020 to 2024

Yu Hailong, Lin Baoqing, Li Lianshan, Xia Zhanping, Liu Lei, Wang Haoyan
Jilin Xianghai National Nature Reserve, Jilin 137215

Jilin Xianghai National Nature Reserve (hereinafter referred to as Xianghai Nature Reserve) is in the northwestern Tongyu County, Jilin Province, with a geographical location of 122°05′-122°35′ E and 44°50′-45°19′ N. The reserve has a total area of 105,467 ha. Xianghai Nature Reserve is along the East Asia-Australasian Flyway, and has a large number of migratory birds, including six crane species of Red-crowned, Sibierian, White-naped, and Hooded Cranes, which are national first-class protected wildlife; Eurasian and

Demoiselle Cranes, which are national second-class protected Wildlife. Among them, the Red-crowned, White-naped, and Demoiselle Cranes breed at the reserve.

From 2020 to 2024, the populations of the five crane species at Xianghai Nature Reserve have been documented. The population of Siberian Cranes has remained above 500 each year; their numbers during spring migration are significantly less than that in autumn. In the past three years, the population of Siberian Cranes in the reserve has increased significantly, reaching a peak of 3,472 in 2024, accounting for about half of its global population (Figure 1).

There are not many White-naped Cranes at Xianghai Nature Reserve. These birds mainly forage at Fulaowenpao, Tongfagunshuiba, Dadupao and other places. The number of White-naped Cranes reached a peak of 68 in 2021, but dropped sharply to 13 in 2022. The situation at Xianghai has improved in 2023 and 2024, with 50 and 47 White-naped Cranes, respectively (Figure 2). White-naped cranes were monitored breeding in Xianghai Nature Reserve for two consecutive years in 2023 and 2024.

There are some Hooded Cranes at Xianghai Nature Reserve, mainly in the meadows and farmlands around Hailiyingzi, Chaoshengtun and Futaipao in the eastern part of the crane core area. Its number is relatively high in autumn. The highest record of Hooded Cranes at Xianghai was 3,764 in 2020. In 2021, the number dropped sharply to 1,225 in 2021, and then increased to 2,078 in 2022, but in the next three years the Hooded Cranes have decreased to 847 in 2024 (Figure 3).

The Eurasian Cranes have the largest number at Xianghai Nature Reserve. The highest number of Eurasian Cranes was recorded in 2022, with 12,640 cranes. Its population has been quite variable, with 8,028 in 2020, 4,974 in 2021, 12,640 in 2022, 3989 in 2023, 10,851 in 2024 (Figure 4).

The Red-crowned Crane is the most famous crane species at Xianghai Nature Reserve, and it is how Xianghai is known as the "Crane Hometown". In recent years, Red-crowned Cranes have mainly foraged near Qingnianba, Fulaowenpao, and Jiandipao, as well as Hanjiashao and Hailiyingzi. The largest number of Red-crowned Cranes was 69 in 2021, while the numbers were between 20 and 42 in other years (Figure 5).

****

黄河三角洲国家级自然保护区一千二管理站鹤类保护研究与实践

刘云鹏[1] 单 凯[2] 杨九洲[2] 李 磊[1] 王宏国[1] 牛汝强[2] 高晓冬[3] 尚 帅[1]
1 山东航空学院生物与医药工程学院，山东滨州 256600
2 山东黄河三角洲国家级自然保护区，山东东营 257590
3 曲阜师范大学生命科学学院，山东曲阜 273165

山东黄河三角洲国家级自然保护区地处黄河入海口，北临渤海湾，是东亚-澳大利西亚和环太平洋两条候鸟迁徙路线的关键地点，也是鹤类重要的迁徙停歇地和越冬地。保护区主要包括大汶流、黄河口、一千二三个部分，其中一千二是保护区重要组成部分，拥有入海河流、芦苇沼泽、泥质滩涂、稻麦农田等多种湿地类型，为鹤类提供了广阔的栖息地和觅食空间，是鹤类的主要活动地。本文是一千二管理站的鹤类监测结果。

1. 鹤类种群情况概述

2024 年 9 月至 2025 年 4 月，通过每月一次的调查发现：灰鹤、白鹤、白枕鹤、丹顶鹤、白头鹤 5 种鹤均在当地迁徙停歇及越冬。其中，秋季南迁期为 10 月中旬至 11 月下旬，灰鹤 2,300 只、白鹤 880 只，白枕鹤 55 只，丹顶鹤 126 只，白头鹤 21 只；越冬期为 12 月至 2 月中旬，灰鹤 1,440 只、白鹤 220 只，白枕鹤 20 只，丹顶鹤 35 只，白头鹤 15 只；春季北迁期为 2 月下旬至 3 月中旬，灰鹤 1,200 只、白鹤 350 只，白枕鹤 21 只，丹顶鹤 330 只，白头鹤 15 只。

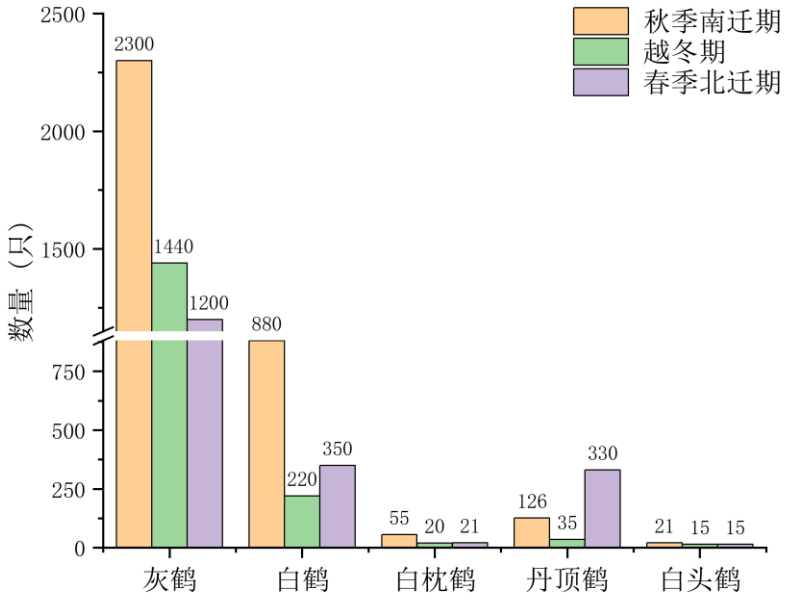


图 1. 山东黄河三角洲自然保护区一千二管理站在 2024/25 冬季（包括秋季迁徙、越冬和春季迁徙期）鹤的种群数量

Figure 1. Numbers of crane species (Eurasian, Siberian, White-naped, Red-crowned and Hooded Cranes) in Yiqianer at Yellow River National Nature Reserve in 2024/25 winter (including fall migration, winter and spring migration)

从迁徙、越冬动态及数量分析，鹤类迁徙停歇规律如下：灰鹤南迁后在此越冬；白鹤南迁后部分种群在此越冬，春季北迁时部分种群在此停歇；白枕鹤南迁后在此越冬；丹顶鹤南迁后部分种群在此越冬，春季北迁时部分种群在此停歇；白头鹤南迁后在此越冬。

从生境选择分析，灰鹤、白鹤、白枕鹤及白头鹤以轮作农田生境为主，食物类型主要为玉米遗粒、水稻遗穗、冬小麦胚轴等植物性食物，因生境选择相同，四种鹤常混群。丹顶鹤主要为芦苇沼泽、近海滩涂生境为主，食物类型主要为底栖生物、鱼类等动物性食物。

从活动规律观察，秋季南迁期种群集中、持续时间长，从 10 月中旬小种群迁至，11 月上旬达数量高峰期，中旬后部分种群南迁数量减少。越冬期种群稳定。春季北迁期自 2 月下旬分批次迁至，种群间日波动大，停歇时间短，至 3 月 15-20 日大部分迁离。鹤类在日活动中，有觅食地和夜宿地选择机制，夜宿地主要为人为干扰极少的近海滩涂和芦苇沼泽。3 月 20 日 9 时至 10 时，观察到集群盘旋的丹顶鹤种群 330 只，集结成群后跨海迁离。

2. 生境保护措施

（1）实施湿地恢复工程。2010 年后，一千二管理站实施淡水补给工程，恢复湿地 3 万余亩，形成了景观结构完整、生境类型多样的湿地生态系统，为鹤类栖息觅食提供了良好生境；

（2）预留鸟类觅食地。对自然保护区内的作物类型进行限制，禁止种植经济作物，而是以降低承包费的方式鼓励种植冬小麦、水稻等粮食作物。对自然保护区有经营管理权的土地，仅限种冬小麦作为鸟类补食区，为越冬鹤类提供了食源保障；

（3）当地农业结构调整。近几年，沿黄两岸大面积种植冬小麦、水稻等粮食作物。水稻收割后遗漏的稻穗、冬季麦苗是鹤类重要的食物来源；

（4）生境结构良好。鹤类每天于夜宿地与觅食地间迁飞，黄河故道、近海滩涂、芦苇沼泽等可提供极少人为干扰的优质生境，减少能量消耗，确保种群稳定。同时，自然保护区实施的湿地恢复工程避免了栖息地碎片化，为鸟类提供完整的生态廊道。

3. 科研监测体系建设

山东航空学院生物多样性调查保护团队致力于黄河三角洲地区的监测保护工作，并与自然保护区建立了长期合作，搭建起了一套完备的科研监测体系。通过多年连续监测，精准掌握了越冬鹤类的集群位置、取食特性等重要资料，监测分析了鹤类种群数量、分布范围及迁徙路线等核心信息，为鹤类

保护筑牢坚实的科学根基。同时积极开展科普教育活动，形成科研、监测、科普协同发力的生态保护新格局，让黄河三角洲地区成为鹤类自由栖息的理想家园。

Crane research and conservation practice at Yiqianer of Yellow River Delta Nature Reserve

Liu Yunpeng[1], Shan Kai[2], Yang Jiuzhou[2], Li Lei[1], Wang Hongguo[1], Niu Ruqiang[2], Gao Xiaodong[3], Shang Shuai[1]
1 College of Biological and Medical Engineering, Shandong Aviation University, Shandong 256600
2 Shandong Yellow River Delta National Nature Reserve, Shandong 257590
3 College of Life Sciences, Qufu Normal University, Shandong 273165

The Yellow River Delta National Nature Reserve is located at the mouth of the Yellow River to the sea, bordering the Bohai Bay to the north in Shandong Province. The reserve, along the East Asia-Australasian and Central Pacific migratory bird flyways, is an important migration stopover and wintering site for cranes. It consists of three main parts, Dawenliu, Huanghekou and Yiqianer. Among them, Yiqianer, with a variety of wetland types such as rivers, reed marshes, mudflats, rice and wheat farmlands, etc., provides a vast foraging habitat for cranes. This article reports on monitoring results of cranes at Yiqianer.

1. Overview of Cranes at the reserve

From September 2024 to April 2025, monthly surveys were conducted at Yiqianer, recording that five crane species of Eurasian, Siberian, White-naped, Red-crowned, and Hooded Cranes all migrated and stopped here for winter. 2,300 Eurasian, 880 Siberian, 55 White-naped, 126 Red-crowned, and 21 Hooded Cranes were recorded during the fall migration from mid-October to late November; 1,440 Eurasian, 220 Siberian, 20 White-naped, 35 Red-crowned, and 15 Hooded Cranes were recorded during winter from December to mid-February; and 1,200 Eurasian, 350 Siberian, 21 White-naped, 330 Red-crowned, and 15 Hooded Cranes were recorded during the spring migration from late February to mid-March.

Many Eurasian Cranes migrated to the reserve in fall and stayed here for winter. For Siberian Cranes, some migrated to the reserve in the fall and stayed there for winter, while some Siberian Cranes stopped over here from south during the spring migration. Some of Red-crowned, White-naped and Hooded Cranes chose to stay here for wintering during the fall migration.

Eurasian, Siberian, White-naped and Hooded Cranes foraged mainly in farmland, eating plant foods such as corn, rice, and winter wheat seedlings. Since they used the same habitats, these four crane species are often seen moving around together in groups. Red-crowned Cranes used mainly reed marshes and mudflats, and their main foods were benthic organisms, fish and other animals.

The fall migration from mid-late October to early November had the highest number of cranes, and then the number declined after mid-November. During the winter months, the number of cranes was relatively stable. The spring migration started in late February, and almost all cranes left the reserve in mid-March (March 15-20). During the migration and winter periods, the cranes roosted in the mudflats and reed marshes along the coast. At 09:10 on March 20, a large flock of 330 Red-crowned Cranes were seen soaring in the sky and flew away.

2. Habitat protection

(1) Wetland habitat restoration. After 2010, a freshwater supplement project has been undertaken at Yiqianer to restore more than 30,000 mu of wetlands, forming a complete and diverse wetland habitat for the cranes.

(2) Reserving bird foraging areas. Many measures have been taken, such as regulating the types of crops in the nature reserve, prohibiting the planting of cash crops, and encouraging the planting of winter wheat, rice and other food crops. In areas where the land is under control by the reserve, only winter wheat is allowed to be planted.

(3) Adjusting the local agricultural structure. In recent years, winter wheat, rice and other food crops have been planted on a large scale along both sides of the Yellow River. The rice left after fall harvesting and winter wheat seedlings are important food sources for cranes.

(4) Maintaining good habitats, especially roosting habitat. Cranes move between night roosts and daytime

foraging areas every day. The old Yellow River channel, mudflats, reed marshes, etc., can provide high-quality roosting habitats with little human interference, which reduces energy consumption and ensures population stability for the cranes. At the same time, the wetland restoration project implemented in the nature reserve has avoided habitat fragmentation and provided a good ecological corridor for birds.

3. Establishment of research and monitoring program

Shandong Aviation University is committed to the monitoring and protection at the reserve, has established long-term cooperation with the reserve, and developed a scientific research monitoring program. Through years of continuous monitoring, important information such as flock locations and foraging characteristics of wintering cranes, crane population size, movement and migration routes have been obtained and analyzed, laying a good scientific foundation for crane protection. At the same time, the reserve has actively carried out education activities, so that all efforts of scientific research, monitoring and education can be coordinated and undertaken by the reserve, making the Yellow River Delta region an ideal home for cranes to live freely.

****

三江国家级自然保护区 2020-2025 年鹤类调查

赵琬婧 徐金生
黑龙江三江国家级自然保护区管理局，黑龙江抚远 156500

黑龙江三江国家级自然保护区（简称三江保护区）位于黑龙江省抚远市，地处乌苏里江和黑龙江交汇处。保护区总面积 198,089hm^2，区内包括森林、灌丛、草甸、沼泽等多种植被类型。这里是东北亚鸟类迁徙通道上的停歇地和繁衍栖息地。多年来，三江保护区通过持续生态修复与科学管理，为鹤类提供了重要栖息环境。

2020-2025 年，三江保护区每年对区内栖息的鹤类进行了监测，获得了保护区鹤类栖息和繁殖的基本信息，为保护区鹤类资源保护和栖息生境恢复提供了科学依据。6 年的监测结果显示，每年在保护区栖息繁殖的鹤类有 3 种，即丹顶鹤（*Grus japonensis*）、白枕鹤（*Antigone vipio*）和白头鹤（*Grus monacha*），其中丹顶鹤和白枕鹤为夏候鸟，白头鹤为旅鸟，且主要是春季迁徙路过这里。三种鹤类中，统计数量最多的为白枕鹤，多年平均值分别为：春季 8.67 只、夏季 4.75 只、秋季 22.25 只；丹顶鹤多年平均值为：春季 9 只、夏季 7.17 只、秋季 11 只；白头鹤多年平均值为：春季 19.5 只、秋季 2 只。

表 1. 2020-2025 年三江自然保护区鹤类数量
Table 1. Cranes recorded from 2020-2025 at Sanjiang National Nature Reserve, Heilongjiang Province

年份	丹顶鹤			白枕鹤			白头鹤	
	春季	夏季	秋季	春季	夏季	秋季	春季	秋季
2020	4	6	11	2	-	4	14	2
2021	7	11	9	6	2	35	-	-
2022	8	4	10	12	-	-	27	-
2023	21	6	14	48	4	32	13	-
2024	3	2	11	67	7	18	24	-
2025	11	14	-	37	6	-	12	-
平均	9.00	7.17	11.00	28.67	4.75	22.25	19.50	2.00

丹顶鹤：三江保护区丹顶鹤迁徙和繁殖数量均较少，每年数量统计变化不大。2020-2025 年保护区多年累计 152 只。近年最早记录丹顶鹤时间为 2023 年 3 月 28 日，记录到 6 只丹顶鹤。最晚离开时间为 2024 年 11 月 12 日，记录到 1 只丹顶鹤。记录数量最多为 2023 年春夏秋累计为 41 只，最少为 2020 年的 21 只。6 年丹顶鹤春季累计共 54 只，记录最多是 2023 年春季的 21 只，最少记录为 2024 年春季仅记录 3 只。夏季多年累计丹顶鹤 43 只，记录最多为 2025 年夏季的 14 只，最少记录为 2024 年夏季的 2 只。秋季多年累计丹顶鹤 55 只，最多记录为 2023 年秋季的 14 只，最少为 2021 年秋季的 9 只。各年份及季节丹顶鹤数量统计如表 1（表 1）。

白枕鹤：白枕鹤为三江保护区记录数量最多的鹤类。但每年的数量变化较大。2020-2025 年多年累计白枕鹤 280 只。记录数量最多为 2024 年，春夏秋累计为 92 只，最少为 2020 年的 6 只，不足 2024 年统计数量的 10%。6 年白枕鹤春季累计共 172 只，记录最多是 2024 年春季的 67 只（记录最大迁徙群数量为 62 只），最少记录为 2020 年春季仅记录 2 只。白枕鹤在保护区繁殖数量较少，夏季多年累计为 19 只，记录最多为 2024 年夏季的 7 只，最少记录为 2020 年和 2022 年夏季未记录到白枕鹤繁殖个体。多年秋季累计白枕鹤 89 只，最多记录为 2021 年秋季的 35 只，最少为 2022 年秋季未记录到白枕鹤迁徙。

白头鹤：白头鹤在三江保护区为旅鸟，每年春季均有记录，但数量较少；且秋季记录数量极少。2020-2025 年多年累计白头鹤 92 只。记录数量最多为 2022 年，春秋两季累计 27 只，最少为 2021 年未记录到白头鹤。6 年白头鹤春季累计为 90 只，记录最多是 2022 年春季的 27 只，最少为 2021 年春季未记录。秋季仅在 2020 年记录迁徙白头鹤 2 只。

Cranes recorded from 2020-2025 at Sanjiang National Nature Reserve, Heilongjiang

Zhao Wanjing　Xu Jinsheng
Sanjiang National Nature Reserve, Fuyuan, Heilongjiang 156500

Sanjiang National Nature Reserve is in Fuyuan City, Heilongjiang Province, at the confluence of Wusuli River and Heilongjiang River. The total area of the reserve is 198,089 ha, with a variety of vegetation types such as forests, shrubs, meadows, and swamps. This is an important stopover and breeding habitat for migratory birds in Northeast Asia. Over the years, Sanjiang Nature Reserve has provided an important habitat for cranes through habitat restoration and management.

From 2020 to 2025, Sanjiang Nature Reserve monitored cranes breeding and stopping over in the reserve, providing a scientific basis for the protection of crane resources and the habitat restoration.

There are three species of cranes recorded in the reserve, including Red-crowned, White-naped and Hooded Cranes. Among them, Red-crowned and White-naped Cranes spend summer in the reserve, while Hooded Cranes stop over here, mainly passing through in spring. Among the three species of cranes, the White-naped Crane has the largest number, with an average of 8.67 in spring, 4.75 in summer, and 22.25 in fall; for Red-crowned Cranes, 9 in spring, 7.17 in summer, and 11 in fall; Hooded Crane, averages 19.5 in spring and 2 in autumn (Table 1).

Red-crowned Crane: The number of this species in Sanjiang Nature Reserve is relatively small. From 2020 to 2025, the reserve counted a total of 152 bird-times for Red-crowned Cranes. The earliest arriving record of Red-crowned Cranes in recent years was on March 28, 2023, when 6 birds were recorded. The latest departure time was November 12, 2024, when 1 bird was seen. The largest number of Red-crowned Cranes was 41 in 2023, a combined total of birds counted in the spring, summer and fall, and the smallest was 21 in 2020. There was a total of 54 bird-times for Red-crowned Cranes in spring counts, with the largest number recorded being 21 in the spring of 2023 and the smallest being only 3 in the spring of 2024. In the summer, there were a total of 43 bird-times for Red-crowned Cranes for the six years, with the largest number recorded being 14 in the summer of 2025 and the smallest being 2 in the summer of 2024. In the fall there were a total of 55 bird-times for Red-crowned Cranes for the six years, with the largest number recorded being 14 in the fall of 2023 and the smallest being 9 in the fall of 2021.

White-naped Crane: White-naped Crane is the crane with the largest number of records among the crane species in Sanjiang Nature Reserve. However, their number of cranes varies greatly from year to year. From 2020 to 2025, a total of 280 bird-times for this species were counted in the reserve. The highest number was in 2024, with a total of 92 bird-times combined counts in spring, summer and autumn, and the lowest was 6 in 2020, which is less than 10% of the number counted in 2024. A total of 172 bird-times for White-naped Cranes were recorded in spring in 6 years, with the highest number of 67 recorded in the spring of 2024 (the largest migratory flock recorded was 62 birds), and the lowest was only 2 recorded in the spring of 2020. The number of White-naped Cranes breeding in the reserve is small, with a total of 19 bird-times in summer for the six years, the highest number of records being 7 in the summer of 2024, and the lowest being zero in summers of 2020 and 2022. A total of 89 bird-times for White-naped Cranes were recorded in fall for the six years, with the highest number recorded being 35 in the fall of 2021, and the lowest number being zero in the fall of 2022.

Hooded Crane: Hooded Cranes only stop over during migration in Sanjiang Nature Reserve. It has been recorded every spring, but in small numbers, and very few were recorded in fall. A total of 92 bird-times for

this species were counted from 2020-2025. The highest number of Hooded Cranes was recorded in 2022, with a total of 27 bird-times combined count in spring and autumn, while no Hooded Cranes were recorded in 2021. The total number of 90 bird-times for Hooded Cranes in spring in the 6 years, with the highest number of 27 recorded in the spring of 2022, while no recorded in the spring of 2021. In fall, only 2 migrating Hooded Cranes were recorded in 2020.

****

2024 年洪河国家级自然保护区鹤类繁殖和迁徙调查报告

朱宝光
黑龙江洪河国家级自然保护区，黑龙江建三江 156300

黑龙江洪河国家级自然保护区位于黑龙江省三江平原同江市与抚远市交界处（图 1），总面积约为 23324 公顷（国家林草局整合优化后公布的面积）。三江平原主要繁殖的鹤类有丹顶鹤和白枕鹤，白头鹤在春秋季迁徙过境时做短暂停留进行食物补给。

流经洪河保护区的浓江河发源于前进农场、浓江农场和青龙山农场之间的河间台地，即浓江河与青龙河的分水岭地带。浓江河流经洪河国家级自然保护区、前峰——鸭绿河农场、前哨农场汇入抚远大力加湖水库，最终流入黑龙江。浓江河全长 199 公里，流经保护区全长 27 公里。浓江河属三江平原典型河漫滩湿地，分布着短尾河、牛轭湖和独立明水泡沼。沃绿兰河是浓江河无尾河，全长 7 公里（图 1）。

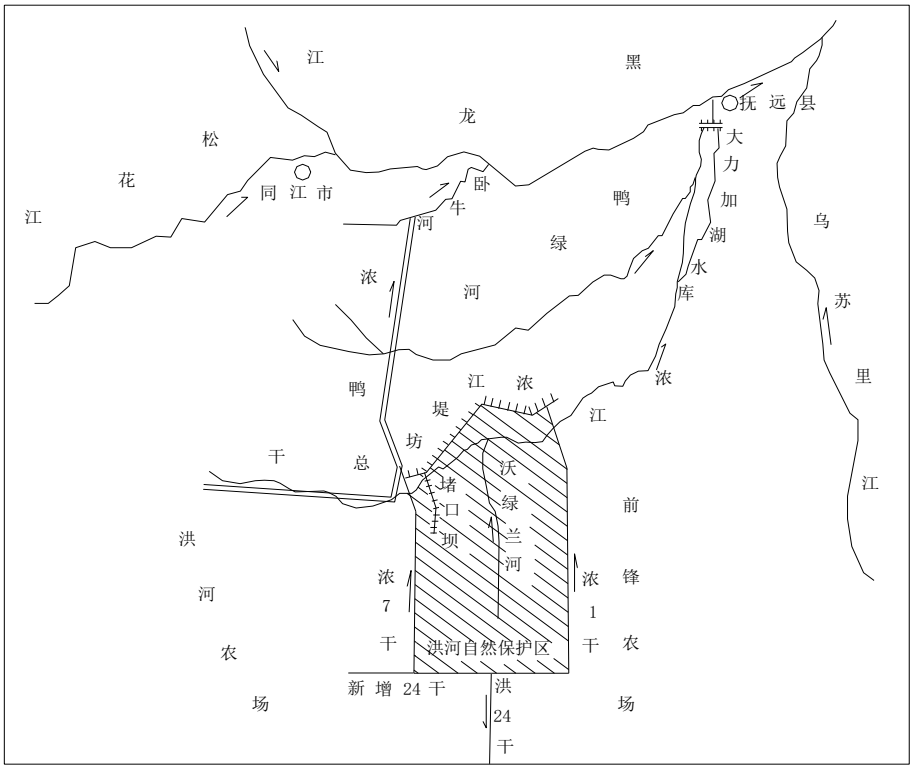


图 1. 洪河国家级自然保护区位置示意图
Figure 1. Location of Honghe National Nature Reserve

浓江河和沃绿兰河所形成的湿地覆盖着漂筏苔草—芦苇植被群丛是丹顶鹤和白枕鹤在保护区的主要繁殖地。

洪河国家级自然保护区于 2021 年开始进行鹤类繁殖调查和监测工作，主要对区内繁殖鹤和春秋季迁徙过境的鹤类等水鸟进行统计，形成年度鹤类等（水鸟）候鸟监测报告。

1. 2024 年鹤类监测情况

我们主要采用样点法进行调查，在保护区鹤类繁殖和栖息的重要区域的制高点或开阔区域设置监测样点。根据保护区鹤类分布情况，我们共设置监测样点 8 个。基本上保证保护区 90%以上的鹤类能够被监测记录到（各监测点名称及地理位置见表 1）。

表 1. 黑龙江洪河国家级自然保护区鹤类监测样点表
Table 1. Monitoring sites and their coordinates at Honghe National Nature Reserve

样点编号	样点名称	地理坐标
1	湿地科普馆	133°37 ′24.06″E，47°45 ′42.00 ″N
2	二抚路 135 km	133°37 ′40.80″E，47°47 ′17.70 ″N
3	二抚路 138 km	133°37 ′52.93″E，47°48 ′55.84 ″N
4	沃绿兰河大桥	133°41 ′38.00″E，47°49 ′44.17 ″N
5	二号桥	133°44 ′27.72″E，47°50 ′06.06 ″N
6	一号桥	133°45′31.56″E，47°50 ′33.60 ″N
7	进水控制闸	133°44′39.78″E，47°51′56.16 ″N
8	蓄水坝	133°43 ′29.70″E，47°51 ′59.04 ″N

2024 年全年共开展鹤类监测 25 次，其中春季开展 15 次，监测到丹顶鹤 255 只次，白枕鹤 77 只次；秋季开展 10 次，监测到丹顶鹤 219 只次，白枕鹤 410 只次。其中春季 4 月 9 日监测到丹顶鹤最大的一个群体 20 只，4 月 2 监测到白枕鹤 4 只；秋季 9 月 24 日监测到丹顶鹤的最大一群 18 只，10 月 16 日监测到白枕鹤的最大一群 118 只（每天计数的鹤类及其数量见表 2）。

表 2 黑龙江洪河国家级自然保护区监测的鹤类数量（2024 年）
Table 1. Numbers of crane species monitored at Honghe in 2024

监测日期	丹顶鹤（只）	白枕鹤（只）
2024.3.24	4	0
2024.3.26	14	8
2024.4.2	25	13
2024.4.5	32	8
2024.4.9	50	14
2024.4.12	21	4
2024.4.16	17	6
2024.4.19	11	2
2024.4.23	12	8
2024.4.26	5	4
2024.4.30	16	2
2024.5.3	16	2
2024.5.7	8	4
2024.5.14	9	0
2024.09.20	16	0
2024.09.24	30	15
2024.09.25	5	41
2024.09.27	11	3
2024.10.01	42	25
2024.10.04	41	8
2024.10.08	0	0
2024.10.11	25	43
2024.10.16	26	130
2024.10.25	23	141
总计	474	487

2. 2024 年鹤类繁殖情况

2024 年通过监测，丹顶鹤、白枕鹤繁殖的区域主要分布在浓江河和沃绿兰河流域。

通过监测评估，丹顶鹤在保护区繁殖有 12-13 对；白枕鹤繁殖有 10-11 对。其中，浓江河流域分

布有 10-11 对丹顶鹤繁殖巢，有 8-9 对白枕鹤巢；沃绿兰河流域分布有 2-3 对丹顶鹤繁殖巢，有 2-3 对白枕鹤繁殖巢。

3. 鹤类迁徙监测

春季鹤类迁到保护区时间主要集中在 3 月下旬-4 月下旬。丹顶鹤和白枕鹤春季迁到保护区呈现 2 只成体或 2 只成体+1 只亚成体且在某一监测区域多次出现，多可认定为在此区域参加繁殖；春季呈现多只个体或多只个体+亚成体迁到保护区不分群，多可认定为迁徙过境的或未参加繁殖群体。春季迁到保护区丹顶鹤和白枕鹤多集中在 4 月中上旬，3 月中下旬迁来的数量较少。

秋季 9 月中下旬家族式活动的丹顶鹤和白枕鹤多是在保护区繁殖的鹤类，10 月中上旬监测到 10 只以上的丹顶鹤群体和 20 只以上的白枕鹤群体多是保护区周边地区或俄罗斯远东地区的鹤类，且监测中明显可见数只幼鹤。秋季迁离保护区时间多集中在 10 月下旬，且和天气变化有密切联系，气温急剧下降或降雪，鹤类会集中南迁。

监测显示：无论是在保护区参加繁殖的鹤类和周边地区及俄罗斯远东迁徙过来的鹤类秋季多呈现出觅食时间多在保护区外围收割后的稻田或玉米田中觅食，中午或傍晚飞回保护区休息和过夜。

白头鹤春秋季监测数量少且在保护区停留时间短。

图 1. 2024 年春季监测到的白枕鹤群体
Figure 1. A flock of White-naped Cranes in spring of 2024 at Honghe

图 2. 2024 年秋季监测到的丹顶鹤家族
Figure 2. A family of Red-crowned Cranes in fall of 2024 at Honghe

图 3. 2024 年秋季监测到的白枕鹤集群
Figure 3. A flock of White-naped Cranes in fall of 2024 at Honghe

图 4. 2024 年秋季白枕鹤在稻田中觅食
Figure 4. A flock of White-naped Cranes foraging in rice field in fall of 2024 at Honghe

Cranes breeding and migrating in 2024 at Honghe National Nature Reserve, Heilongjiang

Zhu Baoguang
Heilongjiang Honghe National Nature Reserve, Jiansanjiang, Heilongjiang 156300

Heilongjiang Honghe National Nature Reserve is located at the junction of Tongjiang City and Fuyuan City in Sanjiang Plain of Heilongjiang Province (Figure 1), with a total area of about 23,324ha. In the Sanjiang Plain, Red-crowned and White-naped Cranes breed, while Hooded Cranes stop over to replenish food during their spring and fall migrations.

Nongjiang River flowing through the Honghe Nature Reserve originates from an area between Qianjin, Nongjiang and Qinglongshan Farms. It runs through the reserve, Qianfeng-Yalu River Farms, Qianshao Farm, enters Dalijiahu Reservoir, and finally flows into Heilongjiang River. The Nongjiang River is 199 km long, and the total length flowing through the reserve is 27 km. The Nongjiang River is a typical floodplain wetland in the Sanjiang Plain, with small rivers, oxbow lakes, shallow water and marshes (Figure 1). The wetlands formed by Nongjiang and Wolulan Rivers are covered with clumps of sedge meadows and are the main breeding habitats for Red-crowned and White-naped Cranes in the reserve.

Honghe National Nature Reserve began conducting crane breeding surveys and monitoring in 2021, mainly counting the cranes as well as other waterbirds breeding and migrating through the area in spring and fall.

1. Crane monitoring in 2024

We mainly use the sampling method to conduct surveys, setting up monitoring sampling points at vantage sites or open areas in important areas where cranes breed and forage in the reserve. According to the distribution of cranes in the reserve, we set up a total of 8 monitoring sampling points, covering more than 90% of the cranes in the reserve (see Table 1 for the names and geographical locations of each point).

A total of 25 survey days were conducted in 2024, including 15 in spring, with 255 Red-crowned Crane-times and 77 White-naped Crane-times monitored; 10 in fall, with 219 Red-crowned Crane-times and 410 White-naped Crane-times monitored. The largest group of Red-crowned Cranes was 20 on April 9 in spring, and 4 White-naped Cranes on April 2; the largest group of Red-crowned Cranes was 18 on September 24 in fall, and the largest group of White-naped Cranes was 118 on October 16 (Table 2).

2. Cranes breeding in 2024

The Red-crowned and White-naped Cranes bred mainly in the Nongjiang and Wolulan River basins in 2024.

There were 12-13 pairs of Red-crowned Cranes and 10-11 of White-naped Cranes breeding in the reserve. Among them, 10-11 pairs of Red-crowned Cranes and 8-9 pairs of White-naped Cranes nested in the Nongjiang River basin, and 2-3 pairs of Red-crowned Cranes and 2-3 pairs of White-naped Cranes bred in the Wolulan River basin.

3. Crane migration monitoring

Cranes migrated to the reserve in spring mainly in late March to late April. Red-crowned and White-naped Cranes arriving in spring in pairs or 2 adults + 1 sub-adult were most likely to breed in this area, while many in flocks of juveniles were observed passing here or stayed here without nesting.

The Red-crowned and White-naped Cranes moving around in family groups in mid-to-late September were mostly birds that bred in the reserve, while monitored in mid-to-early October were mostly cranes moving in breeding outside the reserve or in the Russian Far East; several chicks were clearly visible with their parents. The time of migration from the reserve in fall was mostly in late October. The cranes migrated south in large numbers when the temperature dropped sharply or snow falls.

Both species of cranes that bred in the reserve and migrated from surrounding areas foraged in the harvested rice or corn fields outside the reserve in fall, and came back to the reserve to rest at noon or roost at night.

Small numbers of Hooded Cranes were recorded in spring and fall, and they stayed in short time in the reserve.

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

尕海则岔国家级自然保护区近 5 年黑颈鹤数量及其变化

王 琳
甘肃尕海则岔国家级自然保护区管护中心，甘肃碌曲 747200

甘肃尕海则岔国家级自然保护区位于甘肃省西南部的甘南藏族自治州碌曲县境内，地理坐标介于 102°05′00″~102°47′39″E、33°58′12″~34°32′16″N，总面积 247,431hm^2。保护区大部分区域在海拔 3200~4000 m 之间。境内包括著名的野马滩、尕海滩（姜托滩）、郭茂滩（果芒塘、郭莽滩）、晒银滩、布俄藏滩（尕尔娘）等，都是良好的天然牧场。保护区湿地地处黄河上游源区，为若尔盖高原沼泽湿地的重要组成部分，是我国典型的内陆高寒湿地类型之一，也是黄河水源涵养和生态保护重要保护地。2011 年 9 月，尕海则岔保护区湿地被列入国际重要湿地名录，成为国家重点保护的湿地资源，湿地总面积 43,176hm^2。经调查统计，分布在保护区的湿地植物共 54 科 386 种；野生动物 29 科 109 种。

尕海湿地是候鸟西部迁徙路线的通道之一，也是候鸟迁徙途中重要的停歇地（中转站、驿站），每年春秋迁徙季节，大量候鸟汇集尕海湿地，特别是黑鹳、黑颈鹤、斑头雁等候鸟，春季北迁途中在尕海湖周边聚集补充能量，一部分就地繁衍，另一部分继续前行；而在秋季南归时，它们也会在尕海湖周边大量集群，经过一段时间补充能量后一路南行。

1. 监测地点及方法

在尕海湿地的监测主要集中在尕海滩、郭莽滩、尕尔娘等地。采用样线法对这三块区域进行调查，尕海滩样线长 27 km、郭莽滩样线长 7.8 km、尕尔娘样线长 13 km。监测团队通过点线结合方式，按照规划好的样线进行监测，利用单筒、双筒望远镜及无人机观察确认。2020-2024 年间，累计监测黑颈鹤的天数为 169 天。

2. 监测结果

根据 2020-2024 年监测数据显示，首批到达尕海湿地的黑颈鹤保持在 2-5 只之间（表 1）；2022 年记录到的黑颈鹤数量最多为 82 只；2024 年记录到的黑颈鹤繁殖对最多为 8 对，繁殖时间自 5 月上旬开始。

3. 结论与讨论

（1）迁徙情况

根据 2020-2024 年的监测数据显示，黑颈鹤每年 3 月中旬迁来，在尕海湿地筑巢、繁殖，11 月下旬迁走；说明了尕海湿地是黑颈鹤重要的繁殖地之一。2024 年首次环志了两只黑颈鹤，通过对环志黑颈鹤的持续监测，掌握了黑颈鹤栖息范围和迁飞路线。监测结果显示，尕海湿地的黑颈鹤主要在云南大山包国家级自然保护区越冬。

（2）数量变化

2020-2024 年 5 年期间，黑颈鹤数量呈上升趋势，从 2020 年的 29 只增加到 2024 年的 77 只，总体数量保持在 80 只左右；同时，黑颈鹤筑巢数量也呈上升趋势，从 2020 年的 3 对增加到 2024 年的 8 对。在禁牧措施实施前，由于牛、狐狸以及人为干扰的原因，黑颈鹤数量曾一度减少，繁殖巢时常遭破坏。禁牧措施实施后，黑颈鹤食物充足，湿地环境的改善对黑颈鹤繁殖产生了积极的影响。

（3）采取保护措施

湿地生态效益补偿项目：实施了 4 年的尕海湿地生态效益补偿项目，在尕海滩、郭莽滩实施禁牧共计 58,209 亩。通过禁牧，使湿地得到休养生息，湿地维持生物多样性和涵养水源的能力显著提升，为黑颈鹤等鸟类繁衍生息提供了良好的栖息和繁殖生境。

宣传与保护行动：近年来，我们加大了宣传力度，发表新闻 131 篇；开展了迁徙候鸟投食及专项宣传活动，在候鸟比较集中的尕海湖、郭莽滩周边开展多次迁徙候鸟投食行动，共投食超过 1,000 kg，有效补充候鸟体力；同时，结合“野生动物保护宣传月”和“爱鸟周”活动，在尕海中心小学开展了爱鸟周活动知识竞赛，增强了师生的保护意识。此外，对非法猎捕、经营野生鸟类的违法行为进行新闻曝光，有效打击相关的不良活动。

表 1. 2020—2024 年尕海则岔自然保护区的黑颈鹤数量
Table 1. Numbers of Black-necked Cranes recorded at Gahai-Zecha National Nature Reserve from 2020-2024

年度	迁来时间	迁飞时间	时间	数量/只	最大数量/只	卧巢数量/对	破壳育雏/只
2020	3-21	11-9	3-21 4-13 5-20 6-13 7-15 8-1 9-15 10-2 11-9	2 15 25 29 16 20 20 23 3	29	3	4
2021	3-18	11-4	3-18 3-21 4-6 5-25 6-28 7-25 8-29 9-21 10-28 11-4	4 11 15 15 26 26 18 28 18 14	28	3	6
2022	3-22	11-18	3-22 3-28 4-20 5-19 6-30 7-12 8-3 9-28 10-4 11-18	5 16 18 17 58 82 69 37 19 17	82	2	4
2023	3-15	11-15	3-15 3-31 4-7 5-31 6-24 7-23 8-20 9-14 10-25 11-15	5 7 19 32 52 42 28 34 61 离开	61	2	3
2024	3-19	11-17	3-19 3-29 4-28 5-20 6-29 7-12 8-26 9-6 10-6 11-17	4 8 39 70 77 75 69 68 52 已离开	77	8	14

Black-necked Cranes in Gahai Zecha National Nature Reserve in the past five years

Wang Lin
Gansu Gahai Zecha National Nature Reserve, Luqu, Gansu 747200

Gahai-Zecha National Nature Reserve is in Luqu County, Gannan Tibetan Autonomous Prefecture, in Southwestern Gansu Province. The reserve (102°05'00"~102°47'39"E, 33°58'12"~34°32'16"N) has a total area of 247,431ha. Most areas of the reserve are at between 3200 and 4000m asl. There are many high-quality grasslands, such as Yematan, Gahaitan (Jiangtuotan), Guomaotanh (Guomangtang and Guomangtan), Shaiyintan, and Buyezangtan (Garniang), etc., all of which are good natural pastures. The reserve is in the upper reaches of Yellow River, forming an important part of the Greater Ruoergai Marshes. It is one of the typical inland alpine wetland ecosystems in China and important protected areas for the water conservation and ecological protection of the Yellow River watershed. In September 2011, the wetland in Gahai-Zecha National Nature Reserve was listed as a Ramsar site. The total area of the wetlands in the reserve is 43,176ha. There are 386 wetland plant species and 109 wetland wild animal species in the reserve.

Gahai Wetland is one of stop-over sites for migratory birds. Every spring and fall, a large number of migratory birds gather in Gahai Wetland, e.g., Black Storks, Black-necked Cranes and Bar-headed Geese, to replenish energy. Some of them stay at Gahai breeding.

1. Survey methods

Three major wetlands -- Gahaitan, Guomangtan, Garniang – were covered in our survey. Three transects, one at a wetland each, were set up, with 27km long for Gahaitan, 7.8km for Guomangtan and 13km for Garmian. The survey team recorded numbers of Black-necked Cranes along the transects with aid of binoculars, spotting scopes, and drones. From 2020 to 2024, the total number of days for observing the Black-necked Cranes was 169.

2. Monitoring results

From 2020 to 2024, the first Black-necked Cranes arrived at Gahai Wetland in a group between 2 and 5 individuals (Table 1). The maximum number of Black-necked Cranes recorded was 82, occurring on July 12, 2022. The maximum number of breeding pairs was 8 pairs, occurring in 2024, and their breeding began in early May.

3. Discussion and conclusion

(1) Migration. Black-necked Cranes arrive in Gahai in mid-March each year, then nesting and breeding, and migrate south in late November. Two Black-necked Cranes banded at Gahaiin in 2024 wintered in Dashanbao National Nature Reserve, Yunnan Province.

(2) Changes in the number of the cranes

From 2020 to 2024, the number of Black-necked Cranes has increased from 29 in 2020 to 77 in 2024. During the same years, the number of breeding pairs also increased from 3 in 2020 to 8 pairs in 2024. Before the grazing ban, the Black-necked Cranes were disturbed by yaks, foxes and human activities; their breeding nests were often destroyed.

(3) Conservation measures taken

Wetland compensation project: The Gahai reserve has implemented a wetland ecological compensation project for 4 years, and a total of 58,209 mu of grassland at Gahaitan and Guomaotan have been protected from livestock grazing. Through the grazing ban, the wetland habitat has been restored for biodiversity and water conservation, significantly enhancing the habitat for foraging and breeding of Black-necked Cranes.

Publicity and protection actions: We have increased publicity efforts and published 131 news articles in recent years. We have carried out migratory bird feeding and outreach activities around Gahaitan and Guomangtan where migratory birds are concentrated. A total of more than 1,000 kg of food have been put out for birds, which effectively replenishes the physical strength of migratory birds. At the same time, during special events such as Wildlife Protection Publicity Month and Bird-Loving Week, we held conservation knowledge contests for local teachers and students to enhance their awareness of protection. In addition, we have exposed the illegal hunting and trading of wild birds in the news, effectively fighting these related activities.

盐池湾国家级自然保护区 2013-2024 年黑颈鹤种群数量及其变化

色拥军 [1] 杨巨才 [1] 潘政伍 [2] 郭玉民 [2]
1 甘肃盐池湾国家级自然保护区，甘肃 736300
2 北京林业大学，北京 100083

为系统掌握盐池湾国家级自然保护区黑颈鹤（*Grus nigricollis*）种群的动态变化，自 2013 年起，甘肃盐池湾国家级自然保护区管护中心持续开展黑颈鹤数量与年龄结构的年度监测工作，为该区域物种保护与栖息地管理提供了长期的数据支撑。

2013 年以来，盐池湾保护区黑颈鹤种群数量总体呈持续增长趋势（图 1）。2013 年记录总数为 86 只，至 2024 年已达 281 只，实现了 226.7%的增长。2014 年数量跃升至 126 只，2015 至 2018 年间波动于 120 至 169 只之间。自 2019 年起，种群数量呈现稳定增长态势，从当年的 154 只逐年增加至 2024 年的 281 只，不断创下历史新高。

从年龄结构来看，2024 年监测数据显示，成体数量为 104 只，亚成体 133 只，幼鸟 44 只，分别占总种群数量的 37.01%、47.33%和 15.66%。与 2013 年相比，成体数量增长了 160%，幼鸟数量增长了 109.5%，亚成体数量则大幅增长了 432%。其中，亚成体数量的持续积累最为显著，表明前期繁殖成功的幼鸟具有较高的存活率，是近年来种群数量增长的主要驱动力。这一年龄结构的变化趋势表明，盐池湾区域黑颈鹤种群呈典型的扩张型结构，幼鸟与亚成体占比较高，种群金字塔底部宽厚，通常具有较高的增长潜力和较强的自我维持能力，表明该区域黑颈鹤种群正处于扩张阶段，具备良好的长期种群稳定性。

图 1. 2013-2024 年盐池湾黑颈鹤数量与年龄结构变化趋势
Figure 1. Trends in population size and ae structure of Black-necked Cranes in Yanchiwan from 2013 to 2024

盐池湾保护区作为黑颈鹤的重要繁殖地之一，持续增长的种群数量和以亚成体为主的扩张型年龄结构，反映出该区域黑颈鹤良好的种群增长与扩散潜力。系统掌握其数量动态与结构特征，有助于科学评估种群发展趋势，为下一阶段的栖息地保护及整体保护策略的优化提供关键数据支撑。

图 2. 盐池湾黑颈鹤（色拥军 摄）
Figure 2. Black-necked Cranes in Yanchiwan (Photo by Se Yongjun)

Black-necked Cranes in Yanchiwan National Nature Reserve from 2013 to 2024

Se Yongjun[1], Yang Jucai[1], Pan Zhengwu[2], Guo Yumin[2]
1 Yanchiwan National Nature Reserve, Subei, Gansu 736300
2 Beijing Forestry University, Beijing 100083

To systematically monitor population dynamics of Black-necked Crane (*Grus nigricollis*) in Gansu Yanchiwan National Nature Reserve, the reserve's management center has conducted annual monitoring of population size and age structure since 2013. This long-term dataset provides critical support for species conservation and habitat management in the reserve.

Since 2013, the population of Black-necked Cranes in the reserve has shown a continuous upward trend (Figure 1). The recorded population increased from 86 individuals in 2013 to 281 in 2024, representing a 226.7% increase. The population rose sharply to 126 individuals in 2014, then fluctuated between 120 and 169 from 2015 to 2018. From 2019 onward, the population has grown steadily, increasing from 154 individuals in 2019 to 281 in 2024, continuously reaching new historical highs.

According to monitoring data in 2024, the population consists of 104 adults, 133 subadults, and 44 juveniles, accounting for 37.01%, 47.33%, and 15.66% of the total population, respectively. Compared to 2013, the number of adults increased by 160%, juveniles by 109.5%, and subadults by 432%. The continuous accumulation of subadults is particularly notable, suggesting high survival rates of juveniles from previous years and highlighting subadults as the primary demographic driver for the recent population growth. This trend in age structure indicates that the crane population in Yanchiwan now exhibits a typical expanding population pyramid, characterized by a broad base dominated by subadults and juveniles. Such a structure is generally associated with strong recruitment potential and self-sustaining capacity, suggesting that the local population is in an active expansion phase with promising prospects for long-term viability.

As one of the key breeding grounds for the species, the Yanchiwan Reserve's continuously increasing population and its subadult-dominated expanding age structure reflect strong population growth and dispersal potential. Ongoing monitoring of population size and structure is essential for assessing future development trends and provides a scientific basis for refining habitat protection and broader conservation strategies.

2023 年-2024 年若尔盖湿地国家级自然保护区黑颈鹤监测结果

卓玛姐 纳么玖 言迫 索郎卓玛 董巴降措
四川若尔盖湿地国家级自然保护区，四川若尔盖 624599

我们在四川若尔盖湿地国家级自然保护区内设置了 4 条样线，共 90 个点位。于 2023 年 11 月鹤类南迁季节和 2024 年 4 月底的繁殖期，各进行一次为期四天的调查。调查期间，运用 8 倍双筒望远镜和 60 倍单筒望远镜进行观测。每个点位观察 10 分钟左右，通过直数法及摄影统计法，记录可视范围内所有鹤类。

2023 年 11 月，在四条样线区域进行观测，中线向东至嫩哇方向记录到 214 只，西北线红星至辖曼方向记录到 11 只、南线唐克至县城方向记录到 24 只，东西线县城至花湖方向记录到 19 只。保护区四条样线的 90 个点位共记录黑颈鹤 268 只，保护区外观测到 14 只，总计 282 只（表 1）。

2024 年 4 月底的调查结果显示，保护区东西南中四条样线，共调查到领域鹤 189 只，群鹤 67 只，共计 256 只；样线附近保护区外共记录到黑颈鹤 102 只，合计 358 只（表 1）。

表 1. 2023 和 2024 年若尔盖保护区的黑颈鹤
Table 1. Numbers of Black-necked Cranes recorded at Ruoergai National Nature Reserve in 2023 and 2024

样线名称	2023 年 11 月	2024 年 4 月
东西线（县城至花湖方向）	19	54
西北线（红星至辖曼、唐克方向）	11	95
南线（唐克至县城方向）	24	55
中线（向东至嫩哇）	214	52
保护区外（样线各点位附近）	14	102
合计	282	358

Black-necked Cranes in 2023-2024 at Ruoergai Wetland National Nature Reserve, Sichuan

Zhuomajie, Namojiu, Yanpo, Suolang Zhuoma, Dongba Jiangcuo.
Ruoergai Wetland National Nature Reserve, Ruoergai, Sichuan 624599

Four transects with a total of 90 points were set up at Ruoergai Wetland National Nature Reserve, Sichuan Province. A four-day survey was conducted, respectively in November 2023 during the fall migration and in late April 2024 during the breeding season. During the surveys, 8x binoculars and 60x spotting scopes were used for observation. Each point was observed for about 10 minutes, and all cranes within the visible range were recorded by direct counting and photographing.

In November 2023, 214 Black-necked Cranes were recorded on Central Transect (from Xiangdong to Nenwa), 11 recorded on Northwest Transect (from Hongxing to Xiaman and Tangke), 24 on South Transect (from Tangke to Ruoergai Town), and 19 on East-west Transect (from Ruoergai Town to Huahu. In addition, 14 cranes were observed outside the reserve, totaling 282 cranes (Table 1).

In late April 2024, a total of 358 Black-necked Cranes, including 189 territorial cranes and 67 flock cranes were recorded along the four transects in the reserve. In addition, 102 black-necked cranes were recorded outside the reserve, totaling 358 cranes (Table 1).

Losing Grace: How Garbage Dumps Are Altering Black-necked Crane Behaviour in the Trans-Himalayas

Pankaj Chandan
Freelance nature conservationist, India

1. Introduction

The Black-necked Crane (*Grus nigricollis*), revered across the Himalayas as a sacred symbol of harmony and purity. The bird is a symbol of ecological balance and cultural heritage in the high-altitude wetlands of the Trans-Himalayas. Found in select areas of India, China, and Bhutan, the species is classified as Near Threatened by the IUCN. In India, Ladakh serves as the key breeding ground for this majestic bird, making its conservation critical. However, alarming changes in its feeding behaviour have been observed recently—most notably, the feeding of cranes on open garbage dumps, in the upper Indus basin in Ladakh in India. Currently the bird is facing a growing ecological and cultural paradox. Often called the "Bird of Heaven" for its graceful appearance and spiritual significance in regions like Ladakh, Bhutan, and Tibet, this iconic species is now being observed feeding at garbage dumps—an unsettling image that contrasts sharply with its revered status.

This emerging behaviour is symptomatic of larger environmental disruptions and changing land-use patterns across the high-altitude wetlands and valleys where these cranes breed and forage. In places like Changthang in Ladakh, in India, local residents and our team have reported sightings of Black-necked Cranes foraging at village garbage sites, particularly during the pre-migratory and post-breeding periods. This shift appears to be driven by a combination of habitat degradation, depletion of natural food sources, and the ready availability of human refuse. This emerging issue warrants urgent attention, not only for the health and survival of the cranes but also for the ecosystem integrity of fragile high-altitude habitats.

2. Cultural and Ecological Consequences

These majestic birds are revered as embodiments of peace, longevity, and spiritual purity. In Buddhist beliefs, the crane is often considered a symbol of higher consciousness and is featured in local folklore, art, and religious narratives. Their graceful arrival each spring is traditionally seen as an auspicious sign, bringing blessings to the people and land. However, the disturbing sight of these sacred birds foraging at garbage dumps stands in stark contrast to their symbolic status. It not only challenges the cultural sanctity attached to the species but also risks undermining generations of traditional conservation values. In many high-altitude sites, where religion and nature are deeply intertwined, such behaviour may trigger a cultural dissonance—a disconnect between traditional reverence and modern reality. If left unaddressed, this contradiction could erode community-driven conservation ethics that have played a pivotal role in protecting Black-necked Cranes and their habitats over centuries.

From an ecological standpoint, the implications are equally alarming. Black-necked Cranes are widely recognized as bioindicators of wetland ecosystem health. Their diet typically consists of aquatic vegetation, tubers, roots, insects, and small invertebrates found in pristine high-altitude wetlands and agricultural fields. A shift in their feeding behaviour toward scavenging at garbage dumps signals significant ecological disruption. It suggests that the natural foraging grounds are either degraded, insufficient, or polluted—forcing the cranes to adapt in ways that compromise their health and ecological role. Moreover, the sight of Black-necked Cranes feeding on garbage is a poignant indicator of dual crises: a cultural one, where sacred symbolism is in danger of being overshadowed by modern neglect, and an ecological one, where the degradation of high-altitude wetlands threatens the survival of one of the Himalayas' most iconic species. Addressing this issue requires a holistic approach—restoring wetlands, improving waste management, and revitalizing cultural conservation values—to ensure that the "Birds of Heaven" are once again seen in the clear light of their natural, untainted habitats.

3. Health Hazards from Ingesting Non-biodegradable Waste

As already mentioned, Black-necked Cranes are primarily omnivorous birds, with a natural diet composed of plant tubers, roots, seeds, aquatic invertebrates, small insects, and agricultural grains. In the high-altitude wetlands these food sources have traditionally supported their nutritional needs. However recent sightings of these birds at garbage dumps is a cause of concern. This shift in foraging behaviour exposes them to a host of

non-biodegradable and toxic materials that pose severe health risks:

(1) **Plastic Ingestion and Intestinal Blockages -** At garbage sites, cranes often mistake colourful plastic wrappers, bags, or packaging for edible material. Once ingested, these plastics are indigestible and can accumulate in the gut, causing blockages in the digestive tract.

(2) **Toxic Substances and Chemical Contaminants --** Garbage often contains residues of pesticides, pharmaceuticals, and heavy metals such as lead and mercury—especially in areas where waste is not properly segregated. When cranes ingest food items contaminated with these toxins, they are exposed to chronic poisoning.

(3) **Physical Injuries from Sharp Objects --** As can be seen from the photographs, the garbage dump contains sharp metal fragments, broken glass and rusted cans that can injure the birds internally if swallowed, or externally if stepped on. These injuries may hinder their ability to forage, fly, or escape predators.

(4) **Increased Risk of Disease Transmission -** Feeding alongside feral dogs, livestock, or other scavengers at garbage sites increases the cranes' exposure to pathogens and parasites. Stress from poor diet and exposure to waste also weakens the birds' natural immunity, making them more vulnerable to disease outbreaks.

(5) **Behavioural Changes and Loss of Natural Foraging Skills --** The increasing reliance of Black-necked Cranes on garbage dumps and other human-provided food sources can lead to significant behavioural changes with potentially far-reaching consequences for the species' ecology, survival, and reproduction. These changes not only affect individual birds but may also disrupt the delicate social and ecological balance that sustains wild crane populations.

(6) **Erosion of Natural Foraging Behaviours --** Black-necked Cranes have evolved to forage in dynamic and often challenging environments—probing marshes, alpine meadows, and agricultural fields for a wide variety of natural foods. Dependency on easily accessible, human-generated waste reduces the need to use these complex foraging skills. Over time, juvenile cranes raised in such conditions may not learn to search for appropriate wild foods, especially during critical life stages such as pre-migration fattening or during breeding when nutritional needs are higher.

(7) **Disruption of Social and Reproductive Behaviour --** Black-necked Cranes exhibit complex social behaviours, including long-term pair bonding, elaborate courtship dances, synchronized calls, and coordinated chick rearing. These behaviours require time, energy, and undisturbed space—conditions that are scarce at crowded garbage dumps. Birds that spend prolonged periods scavenging may have less time for courtship and territory defence, leading to weakened pair bonds and reduced breeding success.

(8) **Altered Migration and Habitat Use Patterns --** If garbage becomes a regular food source, some individuals may begin to delay or even abandon migratory movements, especially during mild winters. This can have cascading effects on genetic mixing between populations, wetland regeneration cycles, and seasonal breeding rhythms.

4. Recommendations for Mitigation

(1) Waste Management Reforms

- Urgent implementation of solid waste segregation, recycling, and sanitary landfill systems in crane habitats.
- Establish crane-sensitive waste zones where garbage is processed away from known roosting and feeding sites.

(2) Habitat Restoration

- Revitalize natural wetlands by improving water retention, plant diversity, and aquatic prey availability.
- Reduce grazing and anthropogenic pressure in critical crane breeding and feeding areas.

(3) Community Engagement and Awareness

- Work with local communities and monasteries to raise awareness about the risks of feeding wildlife and improper waste disposal.

- Promote community-led conservation initiatives such as wetland guardians or eco-clubs in schools.

(4) Research and Monitoring

- There is an urgent need to conduct long-term studies on the dietary shift and health impacts of garbage feeding.
- Deploy camera traps and satellite tags to monitor movement patterns, mortality causes, and habitat use.

(5) Policy and Governance

- Integrate crane conservation into local governance frameworks, especially under village development plans and tourism policies.
- Enforce wildlife protection laws that prevent the dumping of waste in or near designated wildlife habitats.

5. Conclusion

The haunting sight of Black-necked Cranes— revered "Birds of Heaven"—foraging amid piles of plastic and rotting waste in a garbage dump is more than an isolated incident; it is a powerful symbol of ecological imbalance and cultural dissonance. In a landscape as ecologically fragile and spiritually rich as the Trans-Himalayas, such scenes represent not only the degradation of habitat but the erosion of centuries-old values that once safeguarded this sacred species. This disturbing shift in crane behaviour is a warning signal that should not be ignored. If this trend continues, it threatens to undo decades of conservation work and could push this iconic species toward decline—both in number and in spirit.

However, this crisis also presents an opportunity—a moment to renew our collective commitment to conservation. What is urgently required is a coordinated, multi-stakeholder approach that bridges science, spirituality, and policy. Government agencies must strengthen habitat protection and enforce waste management regulations. The key stakeholders who share the high-altitude terrain with these birds, can play a leading role in waste reduction and awareness campaigns. Conservation organizations and researchers must monitor these emerging threats and advocate for policy interventions. And most importantly, local communities, whose cultural and religious ties to the crane run deep, must be empowered and engaged as the custodians of their natural heritage. Restoring the dignity of the Black-necked Crane means more than keeping it off the garbage heap—it means ensuring that it thrives in clean, secure, and sacred wetlands, free to perform its ancient courtship dances under the wide Himalayan sky. Only through collective stewardship can we ensure that future generations see these birds not scavenging in shadows of human negligence, but soaring as true symbols of peace, purity, and ecological harmony. Mitigating this issue will safeguard the health and dignity of these birds that are both ecologically vital and culturally sacred.

Figures 1&2. Black-necked Cranes foraging in the garbage in Lakhak (Photos by Pankaj Chandan)
图 1、2. 在拉达克的一群黑颈鹤在垃圾堆取食（Pankaj Chandan 摄）

有失优雅：垃圾场如何改变喜马拉雅山黑颈鹤的行为

Pankaj Chandan
Freelance nature conservationist，印度

1. 引言

黑颈鹤（*Grus nigricollis*）在喜马拉雅地区被视为和谐与纯洁的神圣象征，是这一地区高原湿地生态健康和文化遗产的象征。黑颈鹤分布于中国、印度和不丹，被世界自然保护联盟列为近危(NT)物种。拉达克是黑颈鹤的主要繁殖地之一，因此其保护至关重要。然而，最近人们观察到，在印度河上游盆地拉达克活动的黑颈鹤，其觅食行为发生了引人注目的变化——最令人担忧的是，黑颈鹤竟然在露天垃圾堆上觅食。目前，这种鸟类正面临着日益加剧的生态和文化悖论。这种标志性物种因其优美的外形以及在拉达克、不丹和西藏等地区的文化价值常被称为“神鸟”。如今，人们却发现它们在垃圾堆上觅食——这一令人不安的场景与倍受崇敬的形象形成了鲜明对比。

黑颈鹤所表现的这种新行为亦或说明黑颈鹤活动的高原湿地和河谷地区正遭受更大规模的生境干扰，以及土地利用模式变化的冲击。在拉达克等地，当地居民和我们的团队都目睹了黑颈鹤在村庄垃圾场觅食，尤其是在迁徙前和繁殖后时期。这种变化似乎是由栖息地退化、天然食物来源枯竭以及人类垃圾的随意堆放等共同因素影响造成的。这一新问题亟待关注，不仅关乎黑颈鹤的健康和生存，也关系到脆弱的高原湿地生态系统的完整性。

2. 文化与生态后果

黑颈鹤象征着和平、长寿、吉祥和圣洁，在佛教信仰中有很高的地位，并出现在当地的民间传说、艺术和宗教叙事中。它们每年春天来到拉达克，为人们和大地带来福祉。然而，这些神鸟在垃圾堆觅食的现象与它们崇高的地位形成了鲜明的对比。这不仅挑战了赋予该物种在文化上的神圣属性，也有可能破坏世世代代传承下来的传统保护价值观。在许多高原地区，宗教与自然紧密交织，黑颈鹤的这种行为可能引发文化冲突——传统崇敬与当今现实之间的脱节。如果这一现象不加以解决，所引发的文化后果可能会侵蚀当地传统的保护伦理，而这些伦理在几个世纪以来的黑颈鹤及其栖息地保护方面发挥了关键作用。

从生态角度来看，其影响同样令人担忧。黑颈鹤被广泛认为是湿地生态系统健康状况的指标物种。它们生活在人为干扰很小的高原湿地和农田，通常取食水生植物、块茎、根、昆虫和小型无脊椎动物。它们的觅食行为转向在垃圾堆里觅食，预示着生态环境遭受到了严重干扰和破坏，黑颈鹤的天然觅食地要么退化、资源不足，要么受到污染——这迫使它们不得不以牺牲其健康和生态角色。此外，黑颈鹤以垃圾为食的场景，引来严重的双重危机：一方面是文化危机，其神圣的象征意义正面临被现代人重新审视甚至忽视；另一方面是生态危机，高原湿地的退化威胁着喜马拉雅山脉最具标志性物种之一的生存。解决这个问题需要采取全面措施——恢复湿地、改善废物管理和振兴文化保护价值——以确保“神鸟”再次生活在自然、未受污染的栖息地中。

3. 摄入不可生物降解垃圾的健康危害

如前所述，黑颈鹤主要为杂食性鸟类，其天然食物包括植物块茎、根、种子、水生无脊椎动物、昆虫和农作物谷物。在高原湿地，这些食物传统上满足了它们的营养需求。然而，最近在垃圾场发现这些鸟类的身影令人担忧。这种新的觅食行为使它们接触到大量不可生物降解的有毒物质，这些物质给它们带来严重的健康风险：

(1) 塑料摄入和肠道阻塞——在垃圾场，黑颈鹤经常将彩色塑料包装纸、塑料袋或包装误认为可食用物质。一旦摄入，这些塑料将无法消化，并会在肠道中积聚，导致消化道阻塞。

(2) 有毒物质和化学污染物——垃圾中通常含有农药、药物以及铅和汞等重金属的残留物，尤其是在垃圾分类不规范的地区。当鹤类摄入受这些毒素污染的食物时，会带来慢性中毒。

(3) 尖锐物体造成的身体伤害——从照片中可以看出，垃圾场里到处都是锋利的金属碎片、碎玻璃和生锈的罐头。如果鹤类吞食这些物品，可能会造成内伤；如果踩到它们，可能会造成外伤。这些伤害可能会降低它们觅食、飞行或躲避捕食者的能力。

(4) 增加疾病传播的风险——在垃圾场与野狗、牲畜或其他食腐动物一起进食，会增加鹤类接触病原体和寄生虫的机会。不良饮食和接触垃圾带来的压力也会削弱鹤类的自然免疫力，使它们更容易受到疾病的侵袭。

(5) 行为变化和自然觅食技能的丧失——黑颈鹤对垃圾堆和其他人类提供的食物源的依赖日益增加，这可能导致其行为发生重大变化，并可能对其生态、生存和繁殖产生深远的影响。这些变化不仅影响个体，还可能破坏维系野生鹤类长期生存的社群和生态平衡。

(6) 自然觅食行为的丧失——黑颈鹤已经进化到能够在动态且并充满挑战的环境中觅食——它们会在沼泽、高山草甸和农田中寻找各种各样的天然食物。对易于获取的人类产生的废弃物的依赖降低了黑颈鹤使用这些复杂觅食技能的必要性。随着时间的推移，在这种环境下长大的幼鹤可能无法学会寻找合适的野生食物，尤其是在迁徙前或繁殖期等营养需求更高的关键时期。

(7) 社会和繁殖行为的破坏——黑颈鹤具有复杂的社会行为，包括一夫一妻制、求偶舞蹈、同鸣和双亲育雏。这些行为显示需要时间、能量和不受干扰的空间——拥挤的垃圾场显然不能使鹤类完成这些活动。长时间翻垃圾觅食的鸟类可能没有时间进行求偶和保卫领地，从而导致配偶联结减弱，繁殖成功率降低。

(8) 迁徙和栖息地利用模式改变——如果垃圾成为它们的正常食物来源，一些个体可能会开始推迟甚至放弃迁徙，尤其是暖冬出现的年份。这可能会对种群间的基因混合、湿地物质循环和季节性繁殖节律产生一系列反应。

4. 管理建议

(1) 改善废物管理
- 在鹤类栖息地及时进行固体废物分类、回收和卫生填埋。
- 在鹤类分布区域，建立废物处理点，这些点要远离已知的鹤类夜宿地和觅食地。

(2) 栖息地恢复
- 通过改善水土保持、植物多样性和水生食物食源，恢复自然湿地的活力。
- 减少鹤类关键繁殖和觅食区域的放牧和人为压力。

(3) 社区参与和宣传
- 与当地社区和寺院合作，提高公众对喂养野生动物和不当废物处理风险的认知水平。
- 扶持当地社区主导的保护举措，例如在学校设立湿地守护者或生态活动小组。

(4) 研究与监测
- 迫切需要对黑颈鹤取食垃圾的食性变化和健康影响进行长期研究。
- 安置摄像设备和佩戴卫星跟踪器，监测鸟类的迁徙模式、死亡原因和栖息地利用情况。

(5) 政策与治理
- 将鹤类保护纳入地方发展框架，尤其是在村庄发展规划和旅游政策中。
- 执行野生动物保护法规，防止在指定野生动物栖息地内或附近倾倒废物。

5. 结论

被尊为“神鸟”的黑颈鹤在垃圾场觅食，这令人难忘的场景并非孤立事件，而是生态失衡和文化冲突的强烈表现。在喜马拉雅山这样生态脆弱而又富有文化的地区，这样的场景不仅代表着栖息地的退化，也代表着曾经守护这一神圣物种的数百年传统价值观的消褪。鹤类行为的这种令人不安的转变是一个不容忽视的警钟。如果这种现象持续下去，它可能会毁掉数十年的保护工作，并可能使这一标志性物种的数量和精神层面都走向衰退。

然而，这场危机也带来了一个机遇——一个让我们重新共同致力于保护的时刻。当务之急是采取一种协调一致的、各个利益相关方参与的方法，将科学、文化和政策结合起来。政府机构必须加强栖息地保护，并执行垃圾管理法规。与这些鸟类共享高原地区的关键利益相关者，可以在减少垃圾和提高公众意识的活动中发挥主导作用。保护组织和研究人员必须监测这些新出现的威胁，并倡导政策干预。最重要的是，必须赋予当地社区权力，让他们参与其中，成为其自然遗产的守护者，因为当地社区与黑颈鹤有着深厚的文化和信仰渊源。恢复黑颈鹤的尊严，不仅意味着让它们远离垃圾堆，还意味着确保它们在清洁、安全、神圣的湿地中繁衍生息，在广阔的喜马拉雅天空下自由地演绎古老的婚舞。只有通过集体的努力，我们才能确保子孙后代看到这些鸟类不是在不良的环境里觅食，而是作为和平、

圣洁以及和谐的真正象征翱翔天际。治理这一问题将维护这些既具有生态重要性又具有文化价值的鸟类的健康和尊严。

****

Black-necked Crane Count in Bhutan in winter 2024/25

Jigme Tshering
Royal Society for Protection of Nature, Thimphu, Bhutan

A survey on the number of Black-necked Cranes in Bhutan in winter of 2024/2025 has been completed. Black-necked Cranes were recorded at six wintering sites in Bhutan, with a total of 709 birds, including 625 adults and 84 juveniles (Table 1).

Table 1. Number of Black-necked Cranes wintering in Bhutan in winter 2024/25

Site	Adult	Juvenile	Total
Phobjikha	565	75	640
Khotokha	2	0	2
Bumdeling	52	7	59
Chumey	2	0	2
Tang	2	1	3
Lhuntse	2	1	3
Total	625	84	709

不丹黑颈鹤 2024-2025 年冬季数量统计

Jigme Tshering
不丹皇家自然保护协会，不丹

不丹 2024-2025 年冬季黑颈鹤数量调查结束，在 6 个越冬地点，共计计数到黑颈鹤 709，其中成年鹤 625，亚成体 84 只。在这 6 个地点中，富布吉卡数量最多，为 640 只，占总数量的 90%（表 1）。

表 1. 不丹黑颈鹤 2024-2025 年冬季数量

地点	成年鹤	亚成体	合计
富布吉卡	565	75	640
库突卡	2	0	2
邦德林	52	7	59
楚米	2	0	2
唐	2	1	3
伦措	2	1	3
合计	625	84	709

****

会泽黑颈鹤国家级自然保护区开展“遇见湿地”冬令营活动

张朝选 孙本双
会泽黑颈鹤国家级自然保护区管护局，云南会泽 654299

建设生态文明，是关系人民福祉、关乎人类未来的长远大计。2025 年 1 月 17 日，由会泽黑颈鹤国家级自然保护区与者海镇新星小学举办的“遇见湿地”冬令营暨生态文明教育和劳动教育实践活动

在会泽黑颈鹤国家级自然保护区拉开帷幕。

本次活动分为行走的思政课、观鹤、遇见湿地生态教育、劳动教育实践活动、爱鹤与五育融合、阅读专刊等环节。

在行走的思政课环节，会泽黑颈鹤国家级自然保护区管护局的宣教人员给师生们分享关于念湖与鹤的故事。保护区长海子片区管理所的宣教干部为师生讲述了黑颈鹤的趣闻和保护黑颈鹤的故事，激发了师生们的保护热情。

在爱鹤与德智体美劳五育融合活动环节，同学们通过自由写作、画手抄报、剪纸、绘画等多种形式，勾勒出心里最美的鹤的身影，表达了共同保护湿地生态、关爱黑颈鹤的美好愿望。

本次活动的开展，让学生亲近了大自然，深入了解湿地生态和鹤文化，开阔了孩子们的视野，也强化了他们爱鹤护鹤的意识。

近年来，会泽黑颈鹤国家级自然保护区与当地教育部门积极推进生态文明教育进校园建设，并将其纳入小学校课程计划，持续开展了“背着书包保护鹤”、“小鹤学堂”、“自然教育小先生”、“遇见湿地”、“小手拉大手保护黑颈鹤”等丰富多彩的活动，形成以自然教育、科普宣教为目标，保护区与学校师生为主体的生态文明教育新格局，持续为保护区建设注入强劲动力。

图 1-4.学生们在会泽保护区冬令营做活动

Figures 1-4. Students participating various activities at the winter camp at Huize nature reserve

Huize National Nature Reserve launched the "Meet the Wetland" winter camp activity

Zhang Chaoxuan, Sun Benshuang
Huize Black-necked Crane National Nature Reserve, Huize, Yunnan 654299

Building an ecological civilization is a long-term program that concerns the well-being of the people and the future of mankind. On January 17, 2025, a "Meet the Wetland" winter camp was organized by the Huize Black-necked Crane National Nature Reserve and Xinxing Primary School of Zhehai Township in the Huize Black-necked Crane National Nature Reserve, Yunnan Province .

The winter camp consisted of activities such as walking, crane watching, wetland ecology and education, education practice, integration of crane love, and moral, intellectual, physical, aesthetic and labor education,

and reading.

Reserve education staff shared stories about Nian Lake, one of the reserve's lakes, and cranes with the teachers and students. The staff at Changhaizi Station of the reserve told the teachers and students interesting stories about Black-necked Cranes and management activities protecting Black-necked Cranes.

In the activity session on loving cranes and integrating the five aspects of moral, intellectual, physical, aesthetic and labor education, the students drew the most beautiful cranes through writing, hand-written newspapers, paper cutting, painting and other forms, and expressed their good wishes to protect the wetland ecology and care for the Black-necked Cranes.

This winter camp allowed students to get closer to nature, gain a deeper understanding of wetland ecology and crane culture, broadened the children's knowledge, and strengthened their awareness of loving and protecting cranes.

In recent years, the Huize Black-necked Crane National Nature Reserve and local education departments have actively promoted ecological education on school campuses and incorporated it into the primary school curriculum programs. They have continued to carry out a variety of activities such as "Carrying Schoolbags to Protect Cranes", "Little Crane School", "Little Teachers of Nature Education", "Meeting the Wetland", and "Little Hands Holding Big Hands to Protect Black-necked Cranes". These activities have formed a new pattern of ecological education with nature education and popular science education as the goals. The participating teachers and students around the reserve have worked together with the reserve to enhance the ecological construction of schools and the reserve.

****

盐池湾发现 5 年前环志的黑颈鹤

色拥军
甘肃盐池湾国家级自然保护区管理局，甘肃肃北 736399

2025 年 4 月 14 日，甘肃盐池湾国家级自然保护区党河湿地保护站监测发现 40 余只黑颈鹤北迁归来。当 4 月 16 日写此文的时候，返回盐池湾的黑颈鹤数量已达 100 多只，约占盐池湾去年在此栖息的黑颈鹤最高数量的一半。

在这些黑颈鹤中，我们发现了一只带着配偶、环号为 B13 的黑颈鹤。这只黑颈鹤是 5 年前由北京林业大学的一个研究团队在盐池湾环志的，当时它是只幼鹤。今年这只鹤有了伴侣，在这里与伴侣翩翩起舞，看来是要开始在盐池湾生儿育女，繁殖后代。

图 1、2. B 13 黑颈鹤在环志 5 年后在盐池湾再次发现
Figures 1 and 2. B13 Black-necked Crane and its mate found 5 years after it was banded at Yanchiwan

Black-necked crane banded 5 years ago found in Yanchiwan

Se Yongjun
Yanchiwan National Nature Reserve, Subei, Gansu 736399

On April 14, 2025, over 40 Black-necked cranes were seen just arriving in Danghe wetland at Yanchiwan National Nature Reserve, Gansu Province. At the time of writing this article on 16 April, 2025, more than 100 Black-necked Cranes have been recorded here, accounting for about half of the highest number of Black-necked Cranes recorded last year.

Among the birds, we spotted a crane with a color band of B13 and with its mate. This bird was banded by a research team from Beijing Forestry University five years ago.

****

云南省剑湖湿地省级自然保护区灰鹤种群数量持续增长

伍和启[1] 李志军[2] 李泽辉[2] 赵永茂[2]
1 中国科学院昆明动物研究所，昆明 650201
2 云南省剑湖湿地保护区管理局，云南剑川 671301

云南省剑湖湿地省级自然保护区位于滇西北横断山脉中南段，大理州剑川县境内。保护区建立于 2006 年，总面积约 4,630 公顷，2016 年被云南省人民政府认定为第一批七个重要湿地之一。剑湖湿地处于滇西横断山脉云岭-哀牢山脉迁徙通道西北段的中心位置，位于我国西部候鸟迁徙的通道上，既是候鸟迁徙过境时的集结点和停歇地，又是迁徙水禽的越冬栖息地。

近年来，随着剑湖流域水环境综合治理项目、金龙河入湖口和永丰河湿地保护与恢复项目等项目的开展，以及保护区管护能力建设和科研宣传的推进，使得湿地环境质量显著提升。通过综合整治和湿地保护恢复，剑湖湿地生态环境持续好转，物种不断丰富，野生动物保护成效显著。黑鹳、灰鹤、彩鹮、白琵鹭等珍稀濒危物种持续被记录。其中，近十年来，剑湖湿地灰鹤数量持续增加，种群呈稳定恢复趋势（表 1）。

表 1. 2015-2024 年云南剑湖监测的灰鹤数量
Table 1. Number of Eurasian Cranes recorded from 2015-2024 at Jianhu, Yunnan

年份	数量
2015	7
2016	24
2017	14
2018	54
2019	28
2020	33
2021	19
2022	33
2023	26
2024	48

鉴于灰鹤等珍稀鸟类对生境面积需求较大的实际，下一步将重点结合保护区生态退耕和项目治理工作，权衡剑湖湿地生态系统和湖周农田生态系统对灰鹤等代表性水鸟保护的重要性，以及自然湿地与人工湿地对水鸟保护的重要性等，在剑湖湿地省级自然保护区逐步建立适合灰鹤等珍稀鸟类栖息的湿地生态系统和湖周农田生态系统，为灰鹤等珍稀鸟类稳步增长打造安全生境和栖息地。

图 1-4. 在云南剑湖湿地各种生境活动的灰鹤（云南省剑湖湿地保护区管理局提供）
Figures 1-4. Eurasian Cranes in varous habitats at Jianhu Wetland, Yunnan (Photos by Yunnan Jianhu Nature Reserve)

Population of Eurasian Cranes in Jianhu of Yunnan continues to grow

Wu Heqi[1] Li Zhijun[2] Li Zehui[2] Zhao Yongmao[2]
1 Kunming Institute of Zoology of Chinese Academy of Sciences, Kunming 650201
2 Yunnan Jianhu Wetland Provincial Reserve, Jinchuan, Yunnan 671301

Jianhu Wetland Provincial Nature Reserve is in the southcentral Hengduan Mountains in Jianchuan County, Dali Prefecture in northwestern Yunnan. The reserve was established in 2006 with a total area of 4,630ha. In 2016, it was recognized as one of the first seven important wetlands by the Yunnan Government. Jianhu Wetland lies in the middle northwest section of the Yunling-Ailao Mountains bird migration corridor in western Yunnan, a very important corridor of migratory birds in western China. Jianhu Wetland, therefore, is not only a staying and stopover site for migratory birds during their migration, but also a wintering area for many migratory waterbirds.

In recent years, with the implementation of several local projects, such as Jianhu Basin Water Environment Comprehensive Management Project, Jinlong River Estuary and Yongfeng River Wetland Protection and Restoration Project, as well as the conservation and management capacity and scientific research publicity of the protected area, the wetland environment at Jianghu has been significantly improved. Rare and endangered species such as Black Storks, Eurasian Cranes, Glossy Ibis, and Eurasian Spoonbills have been newly recorded or increased. Among them, the population of Eurasian Cranes has continued to increase in the past decade, from 7 in 2015, 24 in 2016, 14 in 2017, 54 in 2018, 28 in 2019, 33 in November 2020, 19 in 2021, 33 in 2022, 26 in 2023, and up to 48 in 2024. The Eurasian Crane population in Jianhu Wetland is on a stable recovery track.

To have better habitats for birds such as Eurasian Cranes, the next step for the reserve will focus on habitat restoration and management, and integrate Jianhu wetland conservation and agricultural development around the wetland, creating a healthy environment for Eurasian Cranes and other birds.

会泽黑颈鹤国家级自然保护区近五年鹤类数量变化以及栖息地管理

袁嵘 邓伟 蒋易灿 柳霁纯 李薇 张建军
云南会泽黑颈鹤国家级自然保护区管护局，云南会泽 654299

云南会泽黑颈鹤国家级自然保护区地处长江上游金沙江支流牛栏江流域的乌蒙山腹地，总面积12910.64 公顷，是黑颈鹤东部种群重要的越冬地，全球约 10%的黑颈鹤个体在这里度过冬季。近年来，保护区管护局强化保护管理措施，构建了“监测－修复－科研－社区”的保护体系，保障了鹤类以及其它鸟类的栖息环境，稳定了它们的种群。

1. 监测黑颈鹤数量

黑颈鹤的越冬种群自 2019 年的 1024 只增长至 2024 年的 1389 只，增加了 36%（图 1）；2019 年的幼鹤为 184 只，2024 年为 352 只，幼鹤占整个种群的比例从 18%提升至 25.3%。2024 年冬季，保护区记录到 42 个二成鹤二幼鹤的黑颈鹤家庭（图 2），为保护区建区以来最高。

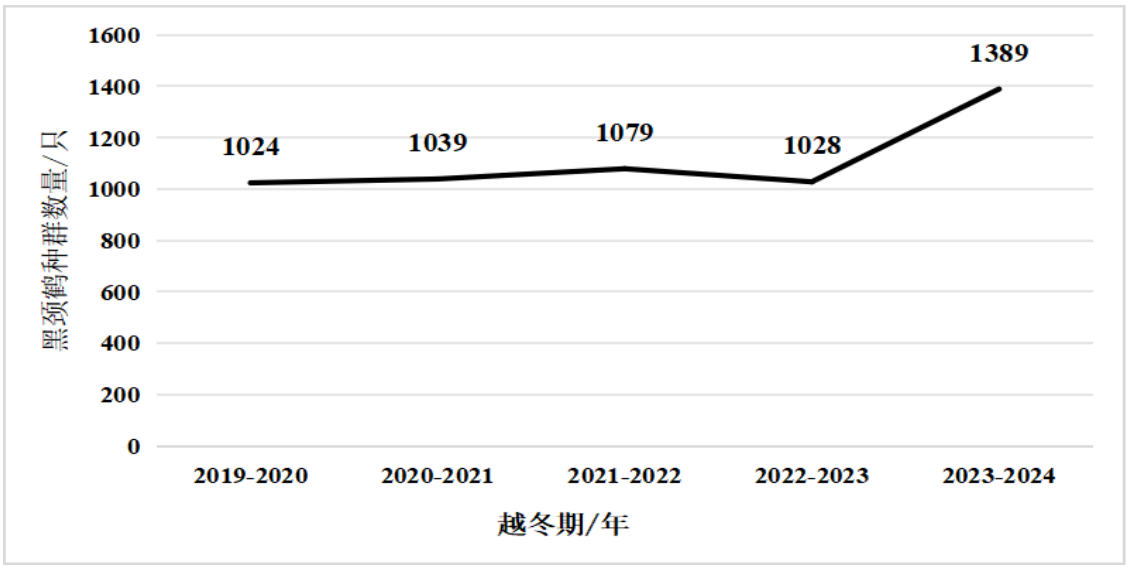


图 1. 2019 年-2024 年冬季会泽黑颈鹤国家级自然保护区的黑颈鹤数量
Figure 1. Number of Black-necked Cranes from 2019-2024 at Huize National Nature Reserve

图 2. 一个 2 成 2 幼的黑颈鹤家庭在觅食
Figure 2. A family of Black-necked Cranes with two chicks at Huize

2. 保护和修复湿地

为了解决黑颈鹤依赖的沼泽、浅滩、农田复合生境退化问题，会泽保护区管护局实施湿地保护与恢复项目，投资 2300 万元将 4352 亩季节性农耕地修复为永久性湿地，新增挺水植物群落 300 ha，配套建设 4 处小微湿地净化系统，核心区湿地面积稳定在 2260 ha。另外，保护区投资 7054.8 万元实施“厕所革命+污水处理”工程，建设 22 套集中式处理设施，实现社区污水 100%截流。上述这些措施实施后，水质从Ⅳ类提升至Ⅲ类标准。2023 年国家五年生态环境保护成效评估显示，保护区生态环境变化评分为（EC）90.59、生态状况评分为（ES）93.98，综合评估等级为“优”。

3. 构建鸟类食源地及候鸟友好型农业体系的

保护区立足候鸟食源需求，遵循保护优先、绿色发展的原则，精准调整农业种植结构。将黑颈鹤及其他候鸟喜食农作物，如马铃薯、荞麦、燕麦、蔬菜、中草药材等作为主要种植方向，建成了四个万亩基地，统筹整合国家生态保护补偿资金与市场要素，构建起“候鸟友好型”农业体系。另外，保护区划定 3000 亩“鹤类友好型农田”，禁止使用违禁农药，建立残膜回收机制，其中 2024 年回收 14 吨，回收率达 92%。

2024 年基地总产值达 2.42 亿元，带动周边 8 个行政村 1200 余户群众年均收入增长 0.8 万元，有效地缓解了人鹤争地矛盾，形成了“农业生产－鹤类食源－社区增收”的共生模式，出现了生态保护与经济发展相互促进的生动局面。

4. 强化科研监测

保护区争取项目资金 100 万元，开展黑颈鹤觅食地现状调查、黑颈鹤夜栖息地生境选择研究、黑颈鹤与灰鹤的混群行为等 6 个专项课题研究。建设了一个标本馆，制作鸟类、昆虫标本 50 份，创建了本地生物多样性数据库。同时，面向社会招募 57 名公益科研监测员，配备无人机、环志设备等专业工具。几年来，保护区在科研和监测上取得了如下产出：

- 黑颈鹤夜栖地偏好海拔 2500—5000 米的高原草甸、沼泽和湿地；
- 混群行为中黑颈鹤与灰鹤的时间生态位重叠率达 68%，为栖息地分区管理提供依据；
- 2024 年监测发现白头鹤、白肩雕等 3 种国家一级保护动物新记录；
- 在云南省野外首次记录到沙丘鹤，使得保护区记录的国家二级保护鸟类种类增至 29 种；
- 拍摄到黑颈鹤夜间栖息于半山坡的行为影像，修正传统认知；
- 提交有效监测报告 89 份，推动建立“专业团队+公众参与”的立体监测网络。

5. 加强管护和社区共治

保护区组建了一只覆盖县－乡－村－组的137人基层管护队伍,这些管护人员承担着巡护、保洁、违建监管多种任务：

- 专职巡护员 32 人：每日开展核心区巡查；
- 社区保洁员 65 人：负责湿地周边垃圾清理，实现“无白色垃圾保护区”；
- 违建监督员 40 人：动态管控核心区 200 米范围内人类活动，拆除违规设施 12 处。

另外，保护区安装了 26 套激光电子围栏+7200 米物理围栏，核心区实现“零干扰”保护。

6. 开展学校环境教育

会泽黑颈鹤自然保护区与国际鹤类基金会合作开展“小鹤学堂”项目，在保护区建立以黑颈鹤和湿地保护为特色的“小鹤学堂”环境教育基地。这个环境教育基地目前开展的活动包括：培训教师 10 名；建立课程体系 1 套；改造鹤元素特色教室 2 间；支持教学用材及教学资源；组织大桥乡杨梅山小学和者海镇多发小学 4～5 年级学生开展自然活动；每学年开展室内环境教育 16 次；开展自然游戏、鹤类户外观察等形式多样的冬/夏令营活动 2 次等。保护区还引入自然教育机构，年接待学员超 5000 人次。

7. 未来展望

2022 年，会泽黑颈鹤保护区被国际湿地公约组织认定为国际重要湿地，同年加入中国人与生物圈保护区网络，共同实践着生态保护与社区发展的双赢战略。未来五年，保护区将重点推进：

（1）智慧保护：构建黑颈鹤个体 DNA 数据库，确保种群能够得到精确的识别与追踪；研发人工

智能模块，运用大数据分析技术，发现并统计区域内的新物种，以及越冬期鸟类迁徙种群、数量、活动区域等。

（2）跨域协同：联合青藏高原繁殖地建立“迁飞廊道保护联盟”；

（3）价值转化：开发“鹤类友好型”农产品认证，推动碳汇交易与自然教育融合。

从千羽翔集到鹤舞念湖，会泽黑颈鹤保护区的实践证明，在人类活动密集的高原湿地，通过科学规划与社会协同，完全可以实现“人鹤共生”的和谐目标。这片湿地的鹤鸣，不仅是黑颈鹤复苏的响亮号角，更是生态文明建设的生动体现。

Cranes and their habitat management in the past 5 years at Huize Black-necked Crane National Nature Reserve, Yunnan

Yuan Rong, Deng Wei, Jiang Yican, Liu Jichun, Li Wei, Zhang Jianjun
Yunnan Huize Black-necked Crane National Nature Reserve, Huize, Yunnan 654299

Huize Black-necked Crane National Nature Reserve in Yunnan is in the central part of Wumeng Mountains, with a total area of 12,910ha. The reserve is an important wintering ground for the eastern population of Black-necked Cranes, and about 10% of the world's Black-necked Cranes spend winter here. In recent years, the reserve has strengthened protection and management to ensure the healthy habitat for cranes and other birds.

1. Monitor Black-necked Cranes

The number of Black-necked Cranes at the reserve has increased from 1,024 in 2019 to 1,389 in 2024, an increase by 36% (Figure 1); there were 184 juveniles in 2019 and 352 in 2024. In winter of 2024, the reserve recorded 42 crane families with two adults and two chicks, the highest since the establishment of the reserve.

2. Protect and restore wetlands

To solve the problem of degradation of the marsh, shallow water, and farmland habitats that Black-necked Cranes rely on, the reserve has implemented a wetland protection and restoration project, investing 23 million yuan to restore 290ha of seasonal farmland to permanent wetlands, adding 300 ha of emergent vegetation communities, and building four small wetland purification systems. The wetland area in the core area has stabilized at 2,260ha. In addition, the reserve has invested over 70 million yuan to implement the "toilet renovation + sewage treatment" project, building 22 sets of centralized treatment facilities, which treat all sewage running into the reserve from communities around the reserve. After the implementation of the above measures, the water quality has been improved from Class IV to Class III standards. The 2023 National Five-Year Ecological and Environmental Protection Effectiveness Evaluation shows that the ecological and environmental change score of the reserve (EC) is 90.59, the ecological status score (ES) is 93.98, and the overall level is "excellent".

3. Develop a migratory bird-friendly agriculture

The reserve aims to develop a farming practice which also benefits the needs of migratory birds. The Black-necked Crane and many other migratory birds like to eat crops, such as potatoes, buckwheat, oats, vegetable, and Chinese herbal medicines. The reserve has constructed four 10,000-mu bases, designated as a "migratory bird-friendly" agriculture. In addition, the reserve has set aside 3,000 mu of "crane-friendly farmland", prohibiting the use of banned pesticides and recycling residual plastic films, of which 14 tons have been recycled in 2024, with a recycling rate of 92%.

In 2024, the total output value of the bases reached 242 million yuan, driving an average annual income increase of 8,000 yuan per household for more than 1,200 households in the eight surrounding administrative villages, effectively alleviating the land use conflict between people and cranes.

4. Strengthen scientific research and monitoring

The reserve has obtained a fund of 1 million yuan to carry out six special research projects, including surveying Black-necked Cranes' foraging areas, studying roost habitat selection, and documenting the behavior for mixed flocks of Black-necked and Eurasian Cranes. A specimen museum was built, 50 bird and insect specimens were made, and a local biodiversity database was created. At the same time, 57 people were

recruited as volunteer researchers, equipped with drones and bird banding tools. Over the past few years, the reserve has achieved the following conclusions and outputs in scientific research and monitoring:

- Black-necked Cranes prefer roosting at plateau meadows, marshes and wetlands at an altitude of 2,500-5,000 meters;
- Habitat of Black-necked Cranes overlaps 68% with that of Eurasian Cranes;
- In 2024, three new records of national first-class protected animals were recorded, including Hooded Crane and Imperial Eagle;
- The reserve recorded Sandhill Cranes, the first in Yunnan;
- Black-necked Cranes were recorded roosting on the hillside;
- 89 monitoring reports have been produced.

5. Strengthen protection and community co-management

The reserve has formed a grassroots management team of 137 people covering counties, townships, and villages. These management personnel are responsible for patrolling, cleaning, and illegal construction supervision. Among the 137 people,

- 32 full-time patrol people;
- 65 community cleaners: responsible for cleaning up garbage; and
- 40 illegal construction supervisors.

In addition, the reserve has installed 26 sets of laser electronic fences, and the core area has achieved "zero disturbance" protection.

6. Conducting environmental education in schools

Huize reserve cooperated with International Crane Foundation to carry out the "Crane School" program. Activities conducted by the Crane School Program include: training 10 teachers; developing a school curriculum; renovating 2 classrooms with crane elements; purchasing teaching materials; organizing 4th to 5th grade students to conduct education activities from Yangmeishan Primary School in Daqiao Township and Duofa Primary School in Zhehai Town; conducting indoor environmental education 16 times per school year; conducting 2 winter/summer camp activities in various forms such as nature games and field crane observation, etc. The reserve also introduced nature education institutions, receiving more than 5,000 people each year.

7. Outlook

In 2022, the Huize Black-necked Crane Reserve was recognized as an internationally important wetland by the Ramsar Convention and joined the Chinese Man and Biosphere Reserve Network in the same year, jointly practicing a win-win strategy of ecological protection and community development. In the next five years, the reserve will focus on promoting:

(1) Building a DNA database of Black-necked Cranes to ensure that the population can be accurately identified and tracked; developing artificial intelligence modules to discover and count new species in the reserve, as well as the migratory populations, numbers, and activity areas of wintering birds.
(2) Promotion of collaboration: jointly establishing a "Flyway Conservation Alliance" with areas on the Qinghai-Tibet Plateau where Black-necked Cranes breed.
(3) Developing "crane-friendly" agricultural product certification and promoting the integration of carbon trading and nature education.

****

大山包黑颈鹤国家级自然保护区近 5 年的鹤类情况

赵子蛟
云南大山包黑颈鹤国家级自然保护区管护局，云南朝阳 657000

云南大山包黑颈鹤国家级自然保护区（以下简称“大山包保护区”）位于云南省昭通市昭阳区，是黑颈鹤东部种群重要的越冬地和停歇地，2021-2025 年，大山包保护区管护局连续 5 年参与鹤联会组织的全国越冬鹤类同步调查，基本掌握大山包保护区鹤类种群数量、分布情况。

1. 调查方法

大山包保护区鹤类夜宿地固定，分别为大海子、小海坝、长会口和殷家碑海子，调查方法均采用夜宿地直数法：通过单筒望远镜或双筒望远镜进行野外观测，直接计数法记录鹤类的种类、数量和成幼数量填写记录表。

调查工作由管护局工作人员完成，共分为 4 个调查小组，每个调查小组 3—4 人，于鹤类起飞前（06:30 左右）到达夜宿地，鹤类起飞后开始统计，至鹤类全部飞完统计完成。调查时间为每年的 1 月 5 日—15 日，受天气（大雾）影响，每年的调查时间不一致。

2. 调查结果

2021-2025 年，大山包保护区越冬黑颈鹤种群数量从 2021 年的 1,395 只增长至 2025 年 2,178 只，灰鹤为 5-12 只。

表 1. 2021-2025 年大山包保护区越冬鹤类数量
Table 1. Number of wintering cranes in the Dashanbao Nature Reserve from 2021 to 2025

越冬期 Winter	调查日期 Surey Date	黑颈鹤 Black-necked Crane					灰鹤 Eurasian Crane
		大海子	小海坝	长会口	殷家碑海子	合计	
2020/21	2021.1.14	752	272	181	190	1,395	0
2021/22	2022.1.5	1,499	230	164	33	1,926	0
2022/23	2023.1.13	629	461	418	390	1,898	5
2023/24	2024.1.12	1,442	178	374	149	2,143	5
2024/25	2025.1.5	1,248	343	278	309	2,178	12

大山包保护区黑颈鹤种群数量 2021 年为 1,395 只，2022 年突然增加至 1,926 只，增长幅度达 38.06%，之后一直保持在 1,898 - 2,178 只，与全球黑颈鹤种群数量增长有较大关系（图 1）。

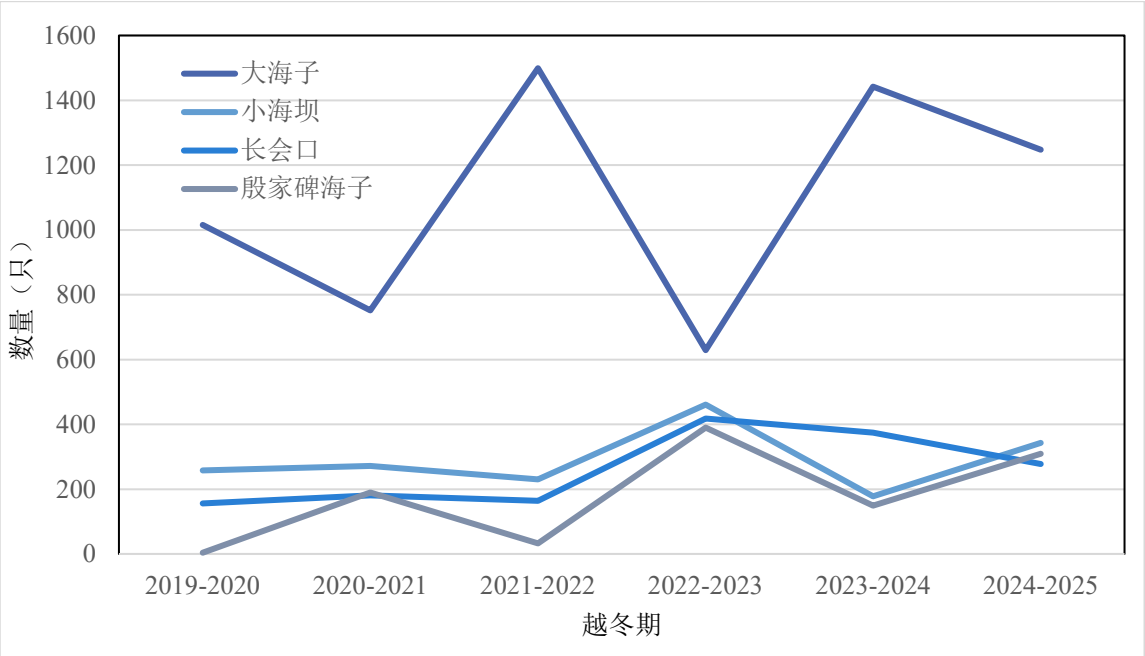


图 1. 2021-2025 年大山包保护区夜宿地黑颈鹤种群数量变化
Figure 1. Number of Black-necked Cranes wintering at Dashanbao from 2021-2025

3. 讨论

根据 5 年四个夜宿地的调查数据显示（图 1），大海子夜宿地黑颈鹤数量最多，但数量呈现忽高忽低的情况，与人为干扰、气温变化有较大关联。殷家碑海子夜宿地黑颈鹤数量极不稳定，因其靠

近村庄和交通要道，人为干扰强度大。在调查过程中，监测到从鲁甸转山包多个方向飞来的黑颈鹤，推断可能在鲁甸转山包村存在多个未知夜宿地，在人为干扰大和低温下前往转山包夜宿，干扰小的情况下在殷家碑海子夜宿。小海坝和长会口黑颈鹤种群数量基本稳定，四个夜宿地存在此消彼长的关系。

近 5 年的结果显示，在大山包保护区越冬的黑颈鹤种群数量趋于稳定在 2,100 – 2,200 只左右。多年来，大山包保护区管护局一直致力于黑颈鹤及其栖息地的保护工作，实施了湿地生态保护补偿、湿地保护与恢复、黑颈鹤食物源基地建设等项目，为黑颈鹤创造一个良好的越冬栖息环境。但由于人口众多，当地社区生产方式单一，人鹤争地的矛盾依然突出，在今后的工作中，要重点解决好当地社区经济发展问题，让群众从传统的农牧业中转型为第三产业，才能实现人鹤和谐共生的目标。

Cranes wintering at Dashanbao Black-necked Crane National Nature Reserve in the past five years

Zhao Zijiao
Dashanbao Black-necked Crane National Nature Reserve, Zhaoyang, Yunnan 657000

Yunnan Dashanbao Black-necked Crane National Nature Reserve (hereinafter referred to as "Dashanbao Reserve"), located in Zhaoyang County of Zhaotong Prefecture, Yunnan Province, is an important wintering and stop-over place for the eastern population of Black-necked Cranes. From 2021 to 2025, the Dashanbao Reserve has participated in the national wintering crane coordinated survey organized by the China United Crane Conservation Committee for five consecutive years, and basically documented the number and distribution of crane populations at Dashanbao Reserve.

1. Survey method

There were two crane species – Black-necked and Eurasian Cranes -- at Dashanbao. The cranes at Dashanbao Nature Reserve have four commonly used roosting sites, including Dahaizi, Xiaohaiba, Changhuikou and Yinjiabeihaizi. We counted the roosting birds with binoculars and spotting scopes, recording the crane species, their numbers and chicks.

There were four survey teams, each team with 3-4 people covering one roosting site, each with 3-4 people. They arrived at the roosting sites and counted the birds before the cranes took off (around 06:30). Each winter, the reserve did the survey during 5-15 January. There were no counts made for the days if the weather (e.g., big fog) was not good for observation.

2. Survey results

From 2021 to 2025, the number of wintering Black-necked Cranes at Dashanbao increased from 1,395 in 2021 to 2,178 in 2025, and the number of Eurasian Cranes was 5-12 (Table 1).

The Black-necked Crane population in the Dashanbao Nature Reserve was 1,395 in 2021, and suddenly increased to 1,926, or by 38.06% in 2022. Since then, it has remained between 1,898 and 2,178 (Figure 1), which is largely related to the growth of the global Black-necked Crane population.

3. Discussion

Of the four roosting sites, Dahaizi has the most Black-necked Cranes in the past five years, but its number fluctuates a lot, possibly closely related to human disturbance and temperature changes. The number of Black-necked Cranes at Yinjiabeihaizi is extremely unstable, because it is close to villages and major traffic with intensive human disturbance. During the survey period each winter, Black-necked Cranes were seen flying in Yinjiabeihaizi from Zhuanshanbao Village in Ludian County, indicating that the birds roosting at Yinjiabeihaizi might roost at Zhuanshanbao if there are disturbances at Yinjiabeihaizi, or vice versa. The population of Black-necked Cranes in Xiaohaiba and Changhuikou is basically stable.

The population of Black-necked Cranes wintering at Dashanbao Nature Reserve has been stable at around 2,100-2,200. Over the years, the Dashanbao Nature Reserve has been committed to the protection of Black-necked Cranes and their habitats, and implemented projects such as wetland ecological conservation compensation, wetland restoration, and the establishment of Black-necked Crane food source bases to create

a good wintering habitat for this species. However, because of many people living inside the reserve, the conflict between people and cranes in land use has been high. In future work, we must focus on solving the problem of local community economic development and help the people transform from traditional agriculture and animal husbandry to service industries to achieve the goal of harmonious coexistence between people and cranes.

****

国际黑颈鹤保护项目及进展

李凤山[1] 张琦[1] 伍和启[2] Pankaj Chandan[3] Jigme Tshering[4] Ishana Thapa[5]
1 国际鹤类基金会, 美国
2 中国科学院昆明动物研究所，中国昆明
3 Freelance conservationist, 印度
4 Royal Society for Protection of Nature, 不丹
5 Bird Conservation Nepal, 尼泊尔

由国际鹤类基金会主持、汉斯·威尔斯多夫基金会资助的“神奇的中亚候鸟迁徙路线：确保高海拔湿地多样性旗舰物种——黑颈鹤的栖息地得以全面保护”项目（简称“国际黑颈鹤保护项目”）于 2024 年 9 月 1 日正式启动。该项目涵盖中国、不丹、印度和尼泊尔，旨在确保中亚迁徙路线上黑颈鹤的栖息地完整，使其种群数量稳定发展，并在未来保持增长趋势，从而有利于高海拔湿地生物多样性的保护。在项目的开发、实施和监测环节，我们采用在国际上广泛应用的工具 ——保护实践开放标准。

国际黑颈鹤保护项目重点关注以下几个战略目标：

- 建立国际层面上利益相关者协调机制和物种保护行动网络
- 加强黑颈鹤及其栖息地的应用性研究和调查
- 加强栖息地规划、保护和管理
- 应对黑颈鹤面临的直接威胁
- 开展环境宣传教育活动
- 增加当地社区可持续的鹤类友好型生计机会

国际黑颈鹤保护项目的活动分为国际、国家和地点层面的活动。在国际层面，项目的主要工作包括：改善中亚迁飞路线重点保护区的保护和管理；建立多国协调与伙伴关系，加强迁飞路线的连通性，共享最佳保护实践；更新黑颈鹤保护战略规划。

在国家和地点层面，中国的主要工作为：强化黑颈鹤保护网络；弥补黑颈鹤生态与健康知识的空缺，优化研究和保护；缓解纳帕海输电线对黑颈鹤的影响；加强黑颈鹤分布区的环境教育工作及相互协调和联系。不丹：制订富布吉卡保护区土地利用规划；恢复邦德林稻田弃耕地的黑颈鹤栖息地，为当地社区改善生计；修缮富布吉卡鹤类教育中心。印度：确定拉达克繁殖种群的迁徙路线和主要中途停留及越冬地点；开展有针对性的黑颈鹤宣传和教育工作；提高社区对鹤类和湿地保护的认识。尼泊尔：确定利米河谷的黑颈鹤数量及其生境，并为黑颈鹤的保护制订策略；提高当地社区对鹤类和湿地保护的认识。

国际黑颈鹤保护项目目前已经开展了以下主要活动：

中国：

- 2024 年 12 月，协助在云南会泽黑颈鹤国家级自然保护区举办了第九届黑颈鹤保护网络年会，100 多名研究和保护代表参加了会议（详见本期伍和启的文章“第九届黑颈鹤保护网络年会暨候鸟迁飞通道保护业务培训会”）。
- 协助出版 2024 年第 1 期《中国鹤类通讯》。《中国鹤类通讯》创刊于 1997 年，目前由中国鸟类学会和中国鹤类保护联合保护委员会主办。该期通讯共有 32 篇研究和保护文章，其中 10 篇是关于黑颈鹤的，表明黑颈鹤保护网络在中国鹤类研究和保护上的重要作用。
- 通过收集在云南越冬黑颈鹤的陆地夜宿行为和地点数据，构建了黑颈鹤陆地夜宿地模型。这个模型可以用来帮助识别黑颈鹤的夜间栖息地以及越冬地和觅食地点。

- 利用在滇东北和黔西北的黑颈鹤卫星跟踪位点，初步构建了栖息地不同质量的模拟模型。项目团队对寻甸、大山包、草海、会泽、永善黑颈鹤越冬生境进行了调查，试图验证模型的预测能力，初步显示与模型分析结果吻合较好。

不丹：

- 加强富布吉卡鹤类教育中心建设，完成鹤类教育中心的硬件和软件建设，中心累计接待游客 10,572 人次。
- 举办第八届邦德林黑颈鹤节。
- 完成富布吉卡的生物多样性、土壤和水调查。这项调查是富布吉卡土地利用规划的一部分，将有助于黑颈鹤栖息地的保护。
- 开展 2024/25 年冬季黑颈鹤数量调查，计数黑颈鹤 709 只，为历史最高值，远高于四十年前的 370 只（见本期 Jigme Tshering 的文章“不丹黑颈鹤 2024-2025 年冬季数量统计”）。

印度：

- 在拉达克首次观察到黑颈鹤在垃圾堆放点觅食。考虑到这可能对该物种的健康构成潜在威胁，在与有关方面沟通后，清理了现场垃圾，并杜绝以后的垃圾倾倒现象（详见本期 Pankaj Chandan 的文章）。
- 2024 年繁殖季节，在拉达克记录到的黑颈鹤数量创历史新高，共计 90 只，其中包括 20 只幼鹤。在 2024 年 11 月中旬，拉达克地区首次观测到黑颈鹤尚未迁离，这可能是气候变化对该物种影响的迹象。
- 在印度东北部记录到 9 只越冬的黑颈鹤。

尼泊尔：

- 调查了尼泊尔西北部的利米河谷，但是未见到黑颈鹤。
- 更新了世界鸟类/生物多样性数据库 (WBDB) 中利米河谷的 IBA 数据。
- 设计印刷了黑颈鹤宣传画。

图 1. 尼泊尔项目团队成员在调查利米河谷，与当地人了解情况（Ishana Thapa 提供）
Figure 1. Nepal team members visit the Limi Valley and interview local people (Photo provided by Ishana Thapa)

图 2. 不丹富布吉卡鹤类教育中心的展示橱架（Jigme Tshering 提供）
Figure 2. Decorated shelves at Crane Education Center at Phobjikha in Bhutan (Photo provided by Jigme Tshering)

A Four-country Black-necked Crane Conservation Project launched

Li Fengshan[1] Zhang Qi[1] Wu Heqi[2] Pankaj Chandan[3] Jigme Tshering[4] Ishana Thapa[5]
1 International Crane Foundation, USA
2 Kunming Institute of Zoology of Chinese Academy of Sciences, China
3 Freelance Conservationist, India
4 Royal Society for Protection of Nature, Bhutan
5 Bird Conservation Nepal, Nepal

The project "*Sacred Flyways: Securing Site Networks for the Black-necked Crane as a Flagship Species for High Altitude Wetland Biodiversity Conservation in the Central Asian Flyway*" funded by the Fondation Hans Wilsdorf was officially launched by International Crane Foundation on September 1, 2024. This project consists of four countries of China, Bhutan, India and Nepal, aiming to secure the flyway site network for the Black-necked Crane in the Central Asian Flyway, contributing to a stable trend in its population during the project cycle and an increasing trend in the long-term, and benefits to High Altitude Wetland biodiversity conservation. The Open Standards for the Practice of Conservation, a commonly used tool by international conservation communities, has been employed in project development, implementation and monitoring.

This project focuses on the following strategies/objectives:

- Develop Stakeholder Coordination and Networking for Multi-Country Species Action
- Strengthen Evidence-based Applied Research and Monitoring
- Enhance Habitat Planning, Protection/Conservation and Management
- Address Direct Threats Abatement
- Implement Conservation Awareness Building and Engagement
- Support for sustainable crane-friendly livelihood opportunities for partner communities

Activities of this project include international, national and site-level activities. At the international level, the main Project Outcomes are that priority sites in the Central Asian Flyway demonstrate improved protection and management; multi-country coordination and partnership is established to enhance flyway connectivity and sharing of best practices; the Black-necked Crane International Strategic Plan is updated and disseminated; and the Black-necked Crane is recognized as a model example of international cooperation in the Central Asian Flyway.

At country and site levels, for China, the activities include: an active and well-run Black-necked Crane network in China is established that represents important sites and actions; knowledge gaps are addressed and recommendations developed for priority research areas; a power line mitigation plan for Napahai Nature Reserve is developed and implemented; and a strengthened Black-necked Crane educator network developed to deliver environmental education to communities and schools. For Bhutan: A land use plan will be developed for Phobjikha Conservation Area; livelihood support will be provided to communities through restoration of abandoned paddy fields used by Black-necked Crane in Bomdeling; and the Black-necked Crane education centre at Phobjikha will be enhanced to deliver environmental education. For India: Black-necked Crane breeding habitat management will be improved in Ladakh against various threats; migration routes and key staging and wintering sites for the Ladakh breeding population will be identified; key threats impacting the breeding population of Black-necked Crane in Ladakh will be reduced; focused Black-necked Crane conservation education at educational institutions near Black-necked Crane habitats; and local stakeholders engaged and community awareness of crane and wetland conservation increased. For Nepal: The knowledge gap regarding the Black-necked Crane and its habitat in the Limi Valley are addressed and recommendations developed for future strategic direction; and local stakeholders/conservation groups are identified and community awareness of crane and wetland conservation increased.

The following are highlights of the project achieved up to date:

China:

- Organizing the ninth annual Black-necked Crane Conservation Network Meeting in December 2024 at Huize Black-necked Crane National Nature Reserve in Yunnan Province of China, with participation of over 100 researchers and conservationists. The Black-necked Crane Conservation Network was established in 2012 to protect the species and their habitats along their flyways, serving as a platform for exchange and cooperation among key sites and conservation communities and for sharing research results and best practices.

- Publishing *China Crane News*. This newsletter, initiated in 1997, is currently run by the Chinese Ornithological Society and China United Crane Conservation Committee. In the most recent issue published in 2024, 10 out of 32 research and conservation articles are about Black-necked Cranes, indicating that the network remains a strong force in crane research and conservation communities in China.
- By collecting data on the terrestrial nocturnal behavior and locations of wintering Black-necked Cranes in Yunnan, a terrestrial roosting model for Black-necked Cranes was constructed. This model could be used to help identify the nocturnal habitats, wintering sites, and foraging sites of black-necked cranes.
- A habitat simulation model was initially constructed using satellite tracking sites for Black-necked Cranes in northeastern Yunnan and northwestern Guizhou. The project team investigated the wintering habitats of Black-necked Cranes in Dashanbao, Caohai, Huize, and Yongshan, attempting to verify the model's predictive ability, which initially showed good agreement with the model analysis results.

Bhutan:

- The Black-necked Crane Education Center renovated at Phobjikha in Bhutan. New display panels have been added to the current building walls, and the visual and video materials, especially for guided tours, have been updated. A naturalist has been hired for the education program. A total of 10,572 visitations have been made to the center.
- The 8th Black-necked Crane Farewell Festival organized at Bomdeling.
- A biodiversity, soil and water survey completed at Phobjikha. This survey is part of the land use planning process for Phobjikha, which will benefit habitat conservation for this species.
- The 2024/25 winter count of Black-necked Cranes completed, with the highest number of 709 ever recorded in Bhutan -- up from 370 nearly four decades ago.

India:

- Black-necked Cranes found foraging in garbage dumping areas in India, a new behavior for this species doing so in Ladakh, which could post a potential health issue of this species. After communicating with the relevant agencies, the garbage dump sites have been cleaned up, and there is no more trash dumping (See Pankaj Chandan's article for details).
- The highest number of juveniles ever recorded in Ladakh during the breeding season of 2024. Of the 80 Black-necked Cranes, 20 were juveniles. Also, for the first time ever, Black-necked Cranes were observed in mid-November in Ladakh, presumably a sign of impact from climate change on the species.
- The first ever coordinated survey for estimation of wintering population of Black-necked Crane conducted in India, recording a total of 9 Black-necked Cranes in the Northeast India.

Nepal:

- Limi Valley was investigated to search for Black-necked Cranes. Our project team from Nepal visited the valley in October 2024, but did not see any cranes.
- Bird Conservation Nepal and BirdLife International have updated IBA data in the World Bird/Biodiversity Database (WBDB) for the Limi Valley after our Nepalese colleagues conducted their first survey to the valley.
- A Black-necked Crane poster was drafted. The poster was developed mainly for awareness, advocacy, and community outreach programs, but also will be useful in getting locals aware of this species during the exploration to the potential breeding ground for the coming breeding season.

第九届黑颈鹤保护网络年会暨候鸟迁飞通道保护业务培训会*

伍和启
中国科学院昆明动物研究所，昆明 650201

2024 年 12 月 14 -15 日，第九届黑颈鹤保护网络年会暨候鸟迁飞通道保护业务培训会在会泽黑颈鹤国家级自然保护区成功召开。此次会议由国际鹤类基金会（ICF）、中国科学院昆明动物研究所、全国鸟类环志中心共同主办，政府部门、高校研究所、国内外多家环保公益组织参与其中。

本次鹤类保护会议是一次富有成效的国际盛会，不仅加深了我们对鹤类保护复杂性的理解，也促进了全球范围内保护力量的凝聚。会泽县县委书记丁东平、云南省曲靖市林业和草原局局长张勤勇、中国野生动物保护协会鹤类联合保护委员会副主任委员/全国鸟类环志中心主任钱法文、国际鹤类基金会副总裁马鹤达等代表分别致辞。此外，还有来自不丹、印度、德国、美国等地的鹤类研究代表以视频的方式致辞，表达了对黑颈鹤保护事业的关心和支持。

本次会议的召开正当其时。在气候变化与城镇化快速发展叠加的今天，面对急剧变化的自然环境和日益复杂的人类活动，黑颈鹤及其栖息地正遭受着前所未有的威胁。因此，加强黑颈鹤保护网络内部的交流和协作，扩展黑颈鹤依赖的迁飞通道，对黑颈鹤越冬和繁殖关键栖息地的保护和修复，显得尤为重要。参加本次会议的科研机构及高等院校 19 家，管护机构 11 家，中央级媒体 3 家，参会人员共计 120 余人。参会成员覆盖了黑颈鹤的繁殖地、停歇地和越冬地。在中国黑颈鹤分布的新疆、青海、西藏、四川、甘肃、云南和贵州等区域，均有成员代表参加，充分体现了黑颈鹤保护网络的协同作用。

本次会议内容聚焦且应用价值高。会议共设置 22 个报告，涵盖多方面内容：综述和回顾报告 1 个；黑颈鹤的保护和研究进展报告 9 个；迁飞通道有关政策和应用报告 2 个；自然教育和社区发展报告 6 个；信息化技术在保护管理中的应用报告 4 个。具体的报告让参会者学到和认识了更多的信息：迁飞通道相关内容的知识分享；GEF 项目推动我国候鸟迁飞通道协同保护和可持续发展；东亚-澳大利西亚候鸟迁飞通道伙伴关系协定的介绍，让我们可以从中亚候鸟迁飞通道的视角，从国与国协作的角度思考黑颈鹤保护相关的问题；社区发展和环境教育，是推动黑颈鹤保护的重要路径。例如，ICF 和其他 NGO 组织在中国开展的环境教育活动，为协调社区发展和保护的关系提供了良好范例；新技术的发展，为黑颈鹤的保护和研究工作扩展了新的视角。这些报告，让我们了解了黑颈鹤研究和保护的最新进展，以及亟待解决的紧迫问题，如黑颈鹤撞击高压线和青藏高原围栏对黑颈鹤造成的伤害等。从另一个方面，这样的研讨必将推动黑颈鹤各项保护事业的发展。

本次会议最大的亮点是新老交替。黑颈鹤保护网络的三位发起人——李凤山博士、杨晓君研究员、钱法文研究员，均将退休。在网络成立的 13 年中，他们付出了诸多心血，致力于维护黑颈鹤网络的稳定，推进了多项黑颈鹤保护的工作，培养了大量黑颈鹤研究人才。他们为黑颈鹤在世界自然保护联盟濒危物种红色名录中的保护等级从易危降至近危做出了卓越的贡献。然而，“青山依旧在，几度夕阳红”，三位老先生心系黑颈鹤保护事业，提携晚辈，已在下一代的黑颈鹤保护群体中推选出 9 位代表，组成新的黑颈鹤保护网络核心小组，继续开展志愿性的服务工作，推进黑颈鹤保护网络的各项工作。

The 9th Black-necked Crane Conservation Network Annual Meeting and Migratory Bird Flyway Protection Workshop held in Huize, Yunnan

Wu Heqi
Kunming Institute of Zoology of Chinese Academy of Sciences, Kunming 650201

The 9th Black-necked Crane Network Annual Meeting and the Migratory Bird Flyway Protection Workshop were successfully held on December 14-15, 2024 at Huize Black-necked Crane National Nature Reserve, Yunnan, China. The meeting was co-organized by International Crane Foundation (ICF), Kunming Institute of Zoology of Chinese Academy of Sciences, and National Bird Banding Center of China, and participated by government departments, universities and research institutions, and many domestic and foreign

* 本文为昆明动物研究所伍和启博士在第九届黑颈鹤保护网络年会暨候鸟迁飞通道保护业务培训会上的总结发言，略有删改。

environmental protection organizations.

This gathering is a fruitful international event, not only deepening our understanding of the complexity of crane protection, but also promoting cooperation of conservation efforts on a global scale. Speeches were delivered at the opening ceremony by Ding Dongping, Secretary of Huize County Party Committee, Zhang Qinyong, Director of Qujing Forestry and Grassland Bureau, Qian Fawen, Deputy Director of United Crane Conservation Committee of China Wildlife Conservation Association/Director of the National Bird Banding Center, and Mahendra Shrestha, Vice President, Asia-Pacific Programs of ICF. In addition, crane research representatives from Bhutan, India, Germany, and the United States delivered virtual speeches expressing their concern and support for the protection of this species at the opening ceremony.

This meeting was held at the urgent timing, with climate change, rapid urbanization, habitat loss of Black-necked Cranes, as well as other threats. Therefore, it is particularly important to strengthen communication and collaboration among members of the Black-necked Crane Conservation Network, strengthen protection among flyways of Black-necked Cranes, and protect and restore the key habitats for wintering and breeding of Black-necked Cranes. About 120 participants from 19 research institutions and universities, 11 nature resource management agencies, and 3 new media participated in the meeting. The participants included people from breeding, stopover and wintering sites of Black-necked Cranes in Xinjiang, Qinghai, Tibet, Sichuan, Gansu, Yunnan and Guizhou, well representing major areas of the Black-necked Crane Conservation Network.

Presentations at the meeting focused on significant research areas, including 22 on crane research reviews, 9 on management and conservation; 2 on policies and applications related to the migratory flyways; 6 on nature education and community development; and 4 on the application of information technology. These reports help us understand the latest progress in the research and protection of Black-necked Cranes, as well as urgent issues that need to be resolved, such as powerline collision by Black-necked Cranes and disturbances to the cranes by grassland fencing on the plateau. These reports allowed the participants to learn and understand more information: knowledge sharing on the flyway; GEF projects promoting the coordinated protection and sustainable development of migratory bird flyway; introduction of the East Asian-Australasian Flyway Partnership allowing us to think about issues related to the protection of Black-necked Cranes from the perspective of the Central Asian Flyway and from the perspective of cooperation between countries; community development and environmental education being important paths to promote the protection of Black-necked Cranes. For example, the environmental education activities carried out by ICF and other NGOs in China providing a good example for coordinating the relationship between community development and protection; the development of new technologies expanding new perspectives for the protection and research of Black-necked Cranes. These reports let us understand the latest progress in the research and protection of Black-necked Cranes, as well as urgent problems that need to be solved. On the other hand, such discussions will help make Black-necked Crane conservation efforts strong.

The biggest highlight of this meeting is that the new generation took over the Black-necked Crane Conservation Network. The three founders of the network - Dr. Li Fengshan, Professor Yang Xiaojun, and Dr. Qian Fawen - will all retire. Over the past 13 years since the establishment of the network, they have devoted a lot of effort in maintaining the stability of the Black-necked Crane Conservation Network, promoting several Black-necked Crane conservation activities, and training a large number of Black-necked Crane researchers. They have made outstanding contributions to the conservation of Black-necked Crane which was downlisted from Vulnerable to Near Threatened by IUCN Red List. Nine young researchers and conservationists have been selected as the next generation of the core group members of the Black-necked Crane Conservation Network to carry on the work and promote the various work of the Black-necked Crane Conservation Network.

****

愿黑颈鹤及其保护事业健康成长*

钱法文
全国鸟类环志中心，北京 100093

在这冬日暖阳、鹤舞云天的美好时节，我们来到云南会泽的黑颈鹤越冬地，迎来第九届黑颈鹤保护网络年会暨候鸟迁飞通道保护研讨会的召开。我谨代表中国野生动物保护协会，以及鹤类联合保护

* 本文为钱法文博士在 2024 年 12 月 14 日第九届黑颈鹤保护网络年会开幕式上的致辞，略有删改。

专业委员会，也代表黑颈鹤保护网络，向远道而来的各位嘉宾、专家学者，以及所有关心和支持黑颈鹤保护事业的朋友，表示最热烈的欢迎和最崇高的敬意！

黑颈鹤，作为终生生活于高原的鹤类，是全球 15 种鹤类中独树一帜的存在。它以其优雅的姿态、坚韧的品格，成为了大自然赋予我们的宝贵财富。我们能够共同见证和探讨黑颈鹤保护取得的成果，这无疑是对多年来所有保护工作者辛勤付出的最好回馈。

回顾过去，黑颈鹤的保护之路充满了挑战与艰辛。从易危到近危，这一转变背后凝聚了无数黑颈鹤人的心血与智慧。忆往昔，在十几年前，当我们面对黑颈鹤种群数量锐减、栖息地遭受破坏的严峻形势时，是那份对生命的尊重与热爱，让我们坚定地走上了这条研究与保护之路。国际鹤类基金会李凤山博士、中国科学院昆明动物研究所杨晓君研究员和全国鸟类环志中心主任钱法文研究员共同商议建立一个黑颈鹤保护网络，将黑颈鹤研究和保护管理的相关人员团结在一起。记得那是 2012 年 8 月，我们在云南昆明召开了“中国黑颈鹤保护与发展研讨会暨黑颈鹤保护网络第一届年会”，并正式成立了黑颈鹤保护网络。从此，一个全新的保护平台应运而生，它汇聚了来自四面八方的专家、学者和保护工作者，大家心往一处想，劲往一处使，共同为黑颈鹤的保护事业添砖加瓦。此后，网络共连续举办了 7 次年会，每一次年会，都是一次智慧的碰撞，一次力量的汇聚，我们分享经验，交流心得，不断推动黑颈鹤保护事业向前发展。2019 年后受到疫情的影响，网络年会不得不中断。而疫情结束后，2023 年 2 月在贵州威宁再次举办第 8 次年会。

今天，我们迎来第 9 次年会，这不仅仅是一次简单的聚会，更是我们共同奋斗、不懈努力的见证。它告诉我们，无论面临多大的困难和挑战，只要我们心怀热爱，团结一心，就没有克服不了的困难，没有达不到的目标。

回顾往昔，黑颈鹤保护网络得到了来自政府、社会、科研机构、黑颈鹤保护地以及国际组织的广泛支持与合作。本次会议得到云南会泽黑颈鹤国家级自然保护区管理局的鼎力支持，得到曲靖市林业和草原局、会泽县委县和政府的高度重视与大力推动，这为本次黑颈鹤保护网络会议提供了坚强的保障和支持。中国科学院昆明动物研究所、全国鸟类环志中心等科研机构的专业技术与科研力量，为黑颈鹤的科学研究、种群监测与保护策略制定提供了有力的科技支撑。国际鹤类基金会（美国）北京代表处等国际组织的积极参与合作，更是拓宽了我们的国际视野，促进了黑颈鹤保护经验的国际交流与合作。

正是有了这样全方位、多层次的合作与支持，我们才能够在黑颈鹤保护上取得如此显著的成效。中动协鹤联会组织的全国越冬鹤类同步调查结果显示，全国黑颈鹤数量近年来持续上升，濒危等级由易危降为近危，成为保护最为成功的鹤类之一，“中国黑颈鹤保护网络”也入选 2021 年 10 月在昆明召开的联合国生物多样性大会的全球生物多样性保护 100+典型案例。这一成绩的背后，是黑颈鹤分布区生态环境的持续改善，是人们对黑颈鹤保护意识的不断提高，更是我们共同努力、不懈奋斗的结果。

然而，我们也必须清醒地认识到，黑颈鹤保护仍然面临着诸多挑战。气候变化导致的栖息环境变化、人为活动干扰、非法猎杀等因素仍然威胁着黑颈鹤的生存与安全。因此，我们不能有丝毫的松懈和麻痹，必须继续加大保护力度，完善保护机制，加强科研攻关，提升保护能力。

在未来的工作中，我们倡议做好以下几个方面的工作：

一是加强栖息地保护与管理。继续完善保护区的基础设施建设，加强巡护监测力度，及时发现和处置威胁黑颈鹤生存的各类隐患。同时，积极推动栖息地生态修复工程，改善黑颈鹤的栖息环境，提高其生态承载力。

二是深化科学研究与监测。加强对黑颈鹤种群动态、迁徙规律、生态习性等方面的科学研究，为制订科学合理的保护策略提供科学依据。同时，以黑颈鹤保护网络为平台，加强国际国内的合作与交流，借鉴国际先进经验和技术手段，提升我们的科研水平和监测能力。

三是加强公众教育与宣传。通过举办各种形式的科普宣传活动，提高公众对黑颈鹤及其生态环境的认识和保护意识。鼓励更多的人参与到黑颈鹤保护中来，形成全社会共同参与保护的良好氛围。

四是推动政策法规的完善与实施。积极呼吁和推动相关政策法规的完善与实施，为黑颈鹤保护提供更有力的法律保障。同时，加强对违法行为的打击力度，坚决遏制各类破坏黑颈鹤及其生态环境的行为。

各位关心和支持黑颈鹤保护事业的朋友们，是你们的关注与支持，让我们更加坚定了保护黑颈鹤的决心和信心。我们将继续以习近平生态文明思想为指引，坚持绿色发展理念，加强生态文明建设，不断推动黑颈鹤保护事业取得新的更大成就。

May Black-necked Crane and its conservation grow strong*

Qian Fawen
National Bird Banding Center, Beijing 100093

In this special occasion, we came to Huize of Yunnan, a wintering site of Black-necked Cranes and participated in the 9th Annual Meeting of the Black-necked Crane Conservation Network/ the Migratory Bird Flyway Protection Seminar. On behalf of the China Wildlife Conservation Association, the United Crane Conservation Committee, and the Black-necked Crane Conservation Network, I would like to express my warmest welcome and highest respect to all the guests, experts and friends who care about and support the cause of Black-necked Crane conservation.

The Black-necked Crane, as a crane species that lives on the plateau all its life, is unique among the 15 crane species in the world. With its elegant posture and tenacious character, it has become a precious treasure given to us by nature. We are here today to witness and discuss the achievements made in the conservation of Black-necked Cranes together, which is undoubtedly the best reward for the tremendous effort of all conservationists over the years.

Looking back, the conservation cause of Black-necked Crane has been full of challenges and hardships. From Vulnerable to Near Threatened status of this species by IUCN, this change is the result of the hard work by all the Black-necked Crane people. Decades ago, when we faced the serious situation of a dramatic decline in the number of Black-necked Cranes and the destruction of their habitats, it was the respect and love for this species that made us firmly pursue this path of research and conservation. Dr. Li Fengshan of International Crane Foundation, Professor Yang Xiaojun of Kunming Institute of Zoology of Chinese Academy of Sciences, and myself, Director of the National Bird Banding Center, jointly discussed the establishment of a Black-necked Crane Conservation Network to gather all relevant personnel in the research, and conservation and management of Black-necked Cranes. I remember that it was in August 2012, when we held the China Black-necked Crane Conservation and Development Workshop in Kunming, Yunnan. The workshop formally established the Black-necked Crane Conservation Network, also symbolizing its first Annual Meeting of the network. Since then, the new conservation platform has come into being, which brings together experts and conservationists from all over the world. Everyone has a common goal and works together to contribute to the conservation of Black-necked Cranes. Since its establishment, the network has held 7 annual meetings in a row. Each annual meeting is a gathering of wisdom and strength. We have shared experiences and exchanged ideas to continuously promote the conservation of Black-necked Cranes. After 2019, the network annual meeting had been interrupted due to the impact of the epidemic. After the epidemic was over, the 8th annual meeting was held at Cao Hai National Nature Reserve in Weining, Guizhou in February 2023.

Today, we are celebrating the 9th annual meeting. This is not just a simple gathering, but also a testimony of our common unremitting efforts. It tells us that no matter how great the difficulties and challenges we face, as long as we have passion and unite as one, there will be no difficulties that cannot be overcome and no goals that cannot be achieved.

Looking back, the Black-necked Crane Conservation Network has received tremendous support and cooperation from the government, scientific institutions, Black-necked Crane protected areas and international organizations. This meeting has received strong support from the Yunnan Huize Black-necked Crane National Nature Reserve and received great attention and promotion from the Qujing Forestry and Grassland Bureau, and Huize County Party Committee and Government. The scientific institutions such as Kunming Institute of Zoology of Chinese Academy of Sciences and National Bird Banding Center have provided strong scientific support for the scientific research, population monitoring and protection strategy of the Black-necked Crane. The active participation and cooperation of international organizations such as the Beijing Representative Office of the International Crane Foundation (USA) has broadened our international vision and promoted international exchanges and cooperation on the experience of protecting the Black-necked Crane.

It is precisely with such all-round and multi-level cooperation and support that we have achieved such remarkable results in the conservation of Black-necked Cranes. The results of the national coordinated survey of wintering cranes organized by the United Crane Conservation Committee show that the number of Black-

* This is a speech by Dr. Qian Fawen at the opening ceremony of the 9th Black-necked Crane Conservation Network Annual Conference at Huize in December 2024 at Huize, Yunnan.

necked Cranes in China has continued to increase in recent years, and the threatened level has dropped from vulnerable to near threatened, making it one of the most successfully protected cranes. The Black-necked Crane Conservation Network was also selected as one of the 100+ typical cases of global biodiversity conservation at the United Nations Biodiversity Conference held in Kunming in October 2021. Behind this achievement is the continuous improvement of the ecological environment in the range area of Black-necked Cranes, the continuous improvement of people's awareness of this species.

However, we must also be aware that the conservation of Black-necked Cranes still faces many challenges. Threats such as changes in habitats caused by climate change, disturbances from human activities, and illegal hunting still threaten the survival of Black-necked Cranes. We, therefore, must continue to enhance protection efforts, improve protection measures, strengthen scientific research, and improve protection capabilities.

Here are some areas that we should focus on in the future:

(1) strengthen habitat protection and management. Continue to improve the infrastructure construction of the reserve, strengthen patrol and monitoring, and promptly address threats that threaten the survival of Black-necked Cranes. At the same time, actively promote habitat ecological restoration projects, improve the habitats, and enhance their ecological carrying capacity.

(2) strengthen scientific research and monitoring. Conduct scientific research on the population dynamics, migration patterns, and ecological habits of Black-necked Cranes to provide a scientific basis for the development of their scientific conservation strategies. At the same time, using the Black-necked Crane Conservation Network as a platform, strengthen international and domestic cooperation and exchanges, learn from international advanced experience and technology, and improve our scientific research and monitoring capabilities.

(3) strengthen public education and publicity. Through various forms of popular science publicity activities, improve the public's understanding and protection awareness of Black-necked Cranes and their ecological environment. Encourage more people to participate in the protection of Black-necked Cranes and form a good environment for the whole society to participate in conservation.

(4) promote the improvement and implementation of policies and regulations. Actively call for and promote the improvement and implementation of relevant policies and regulations to provide stronger legal protection for the Black-necked Cranes. At the same time, we will strengthen fighting illegal activities that hurt Black-necked Cranes and their ecological environment.

Dear friends who care about and support the Black-necked Crane conservation cause, it is your concern and support that have made us more determined and confident in protecting the Black-necked Cranes. We will continue to be guided by Xi Jinping's thoughts on ecological civilization, adhere to the concept of green development, strengthen ecological civilization construction, and continuously promote the Black-necked Crane conservation cause to achieve new and greater achievements.

【保护 管理 宣教】
[Conservation, Management and Education]

守护白鹤：数十年如一日的跨国保护行动

侯博 克莱尔·米兰德
国际鹤类基金会，美国

2024 年，国际鹤类基金会（ICF）迎来双重里程碑：全球《白鹤保护谅解备忘录》签署 30 周年，以及迪士尼保护基金资助的十年计划收官之年。我们的工作取得了显著的成果。

白鹤是全球第三稀有的鹤类，IUCN 红色名录极危物种，栖息在广袤而难以抵达的湿地，迁徙路线跨越多国边界。在保护这一物种的过程中，我们克服了迁徙距离远、生物学特性复杂以及分布国政治差异等重重挑战。国际鹤类基金会作为迪士尼资助项目的牵头方，与中国、俄罗斯的繁殖地、停歇地和越冬地伙伴紧密合作，携手政府、高校、自然保护区、科研机构、当地非政府组织、志愿者及迁徙路线上的社区（从俄罗斯北极到中国东南部），共同守护白鹤。我们自豪地宣布：白鹤东部种群持续壮大——2000 年代数量约 3,500 只，而 2022 年记录到历史新高，约 5,500 只。

图 1. 在吉林莫莫格秋季停歇的白鹤（潘晟昱 摄）
Figure 1. Siberian Cranes staging during fall migration at Momoge, Jilin (Photographed by Pan Shengyu)

中国鄱阳湖是东亚-澳大利西亚迁飞路线上最重要的栖息地之一，全球 98%以上的白鹤东部种群在此越冬。该区域同时是白枕鹤、白头鹤、灰鹤及众多水鸟的庇护所。自 1999 年起，我们与江西鄱阳湖国家级自然保护区合作，建立了长期生态监测体系，并持续培训当地人员开展调查与数据分析。

我们的保护战略覆盖白鹤在中国的停歇地——莫莫格、向海、图牧吉、黄河三角洲、卧龙湖、獾子洞等自然保护区，通过与政府合作，优化湿地与水资源管理，推动建立以鹤类为保护主体的国家公园。

由于全球白鹤均在俄罗斯北极地区繁殖，该区域是迁飞路线保护的关键。过去十年间，我们见证了俄罗斯克塔雷克国家公园的正式设立，配套的保护措施升级后，实现了生态、机构与资金的可持续性。俄罗斯还通过了《白鹤国家行动计划》，并将克塔雷克列为世界遗产预备名录。

跨国合作是白鹤种群恢复的核心。国际鹤类基金会东亚项目主任于倩女士表示：“我们的全球保护工作激励了无数人——从与鹤共生的社区居民、孩童，到自然保护区工作者乃至各级政府官员——他们投身其中，将保护视为己任。”

我们为国际鹤类基金会与合作伙伴的成就深感自豪：不仅惠及白鹤，更守护了其他濒危水鸟。数十年的努力增强了白鹤迁飞路线湿地生态的完整性与韧性。凭借丰富经验与广泛的伙伴网络，我们有信心在未

来十年有效应对气候变化与白鹤行为改变等新挑战。

数字见证成效（自 2015 至 2023 年）

<table>
<tr><td colspan="3">白鹤东部种群从
3,500 只增长至约 5,500 只</td></tr>
<tr><td>38,224
平方公里栖息地获得升级保护</td><td>9,565
平方公里新增为受保护栖息地</td><td>3,211
平方公里栖息地实现科学管理</td></tr>
<tr><td colspan="2">60,000
余名社区居民参与保护行动</td><td>8,224
名青少年加入自然教育项目</td></tr>
<tr><td colspan="3">8,500 万
公众通过宣传认知自然价值</td></tr>
</table>

白鹤保护里程碑

年份	里程碑
1977-1978 年	与苏联科学家开展历史性合作，从西伯利亚苔原的白鹤巢穴采集鹤卵，空运至美国威斯康星州国际鹤类基金会总部，成功建立人工繁育种群。
1981 年	实现全球首次白鹤人工繁育突破。
1993 年	推动《白鹤保护谅解备忘录》签署，初始签约国 4 个，后扩展至 11 个国家。
1990 年代中期	推动了鄱阳湖保护区的成立。目前已升级至国家级自然保护区。
1999 年至今	持续开展鄱阳湖四大子湖泊生态系统监测，系统记录白鹤种群动态、水文及植被变化，所获科学数据为推动鄱阳湖生态系统管理提供关键依据。
2002-2009 年	作为联合国环境规划署/全球环境基金白鹤湿地项目的国际执行机构，在俄罗斯、中国、哈萨克斯坦和伊朗四国开展保护工作。
2004-09 年及 2013-2014 年	支持开展白鹤及大型水鸟的监测工作，覆盖北京以东，黄海沿岸等关键滨海湿地。
2012-2017 年	在莫莫格、图牧吉国家级自然保护区实施"湿地-白鹤-社区-气候变化"综合项目，首次编制中国自然保护区《气候变化脆弱性评估报告》及《气候适应规划》。
2013 年	成功推动中国东北白鹤停歇地获得正式保护地地位。
2022 年	白鹤东部种群数量突破历史记录，达到约 5500 只。

Committed For As Long As It Takes: Decades of Siberian Crane Conservation

Hou Bo & Claire Mirande
International Crane Foundation, USA

For year 2024, the International Crane Foundation (ICF) marks both the 30-year anniversary of the global Memorandum of Understanding Concerning Conservation of the Siberian Crane and the final year of a 10-year plan funded by the Disney Conservation Fund. Our work has achieved very positive, high-level outcomes.

The IUCN Red List Critically Endangered Siberian Crane disperses across vast, inaccessible wetlands and migrates across national boundaries. In ICF's work to conserve the world's third rarest crane, we have risen to the challenges of the immense distances of their migration, the complexities of their biology, and the differing politics of the countries in their range. As the program leader under the Disney grant, ICF works closely with partners from breeding, staging and wintering areas in China and Russia. We collaborate with governments, universities, nature reserves, research institutes, local non-government organizations, and volunteers and communities along their flyway, from the Russian Arctic to southeast China. And we are proud to affirm that the eastern population of Siberian Cranes continues to thrive. In the 2000s, the Siberian Crane population stood at approximately 3,500. In 2022, we saw the highest numbers we've ever recorded: about 5,500 individuals.

China's Poyang Lake is one of the most important habitats along the entire East Asian-Australasian flyway, and more than 98 percent of Siberian Cranes spend their winter there. The area is a haven for White-naped Cranes, Hooded Cranes and Eurasian Cranes, too, as well as many other waterbird species. ICF has worked with Poyang Lake National Nature Reserve since 1999 to build a robust long-term ecological monitoring program and to train local staff to conduct surveys and analyze data, which continues today.

Our Siberian Crane conservation strategy also includes work at staging areas in China, primarily in nature reserves at Momoge, Xianghai, Tumuji, Yellow River Delta, Wolong Lake, and Huanzidong. We are aiming to elevate these major Siberian Crane staging areas by working with the Chinese government to manage the wetland and water resources and establish a national park especially for cranes.

Because all the world's Siberian Cranes breed in arctic Russia, this region is a critical part of our flyway-level conservation strategy too. Over the last decade, we saw the official establishment of Kytalyk National Park in Russia. Upgraded protection provided by the park has meant ecological, institutional, and financial sustainability. Russia has also endorsed a national Action Plan for Siberian Cranes, and Kytalyk National Park is listed as a proposed World Heritage Site.

International cooperation along the Siberian Cranes' eastern flyway is critical to the species' recovery. ICF Director -East Asia Yu Oian explained, "Our global work in Siberian Crane conservation has inspired many people-from those sharing their lands with cranes to school children to nature reserve staff to government officials at all levels-to join this work and make it their own.

We're proud of the achievements of ICF and our many partners, benefiting Siberian Cranes as well as other threatened waterbirds. Our decades of work have also contributed to the integrity and resilience of wetland ecosystems along the flyway. With the rich experience and extensive partnership network, we are confident to move forward to the next decade, effectively addressing emerging challenges such as extreme weather and behavior change.

Impact by the Numbers (2015-2023)

<table>
<tr><td colspan="3">Eastern population of Siberian Cranes increased from
3,500 to around 5,500 birds</td></tr>
<tr><td>38,224
sq. km of habitat received upgraded protection</td><td>9,565
sq. km of new habitat protected</td><td>3,211
sq. km of habitat received improved management</td></tr>
<tr><td colspan="2">At least
60,000
people reached through community outreach efforts</td><td>8,224
youth engaged in conservation programs</td></tr>
<tr><td colspan="3">85 million
people reached through communications that champion the benefits of nature</td></tr>
</table>

Timeline of Our Commitment to Siberian Crane Conservation

Time	Milestone
1977-1978	Collaborated with Russian colleagues to collect eggs from Siberian Crane nests in the Siberian tundra, fly them to lCF in Wisconsin, and start a captive flock.
1981	First captive breeding of Siberian Cranes at ICF.
1993	Memorandum of Understanding Concerning the Conservation of the Siberian Crane was adopted, at first with four signatory countries, later eleven.
Mid-1990s	Advocated for establishment of protected areas at Poyang in addition to Poyang Lake National Nature Reserve.
1999 to present	Monitored ecology of Siberian Cranes, water, and vegetation at four sub-lakes at Poyang Lake National Nature Reserve: our data formed the basis for the reports and letters to senior Chinese Officials advocating ecosystem management of Poyang Lake.
2009-2022	Served as International Implementing Agency for the *UNEP/GEF Siberian Crane Wetland Project* for work in Russia, China, Kazakhstan, and Iran.
2004-09, 2013-14	Supported crane and large waterbird monitoring along the Siberian Crane flyway, including key coastal areas along part of the Yellow Sea east of Beijing.
2012-2017	Implemented the Wetlands, Cranes, Communities, and Climate Change project at Momoge and Tumuji National Nature Reserves and drafted first Climate Change Vulnerability Assessments and Climate Change Adaptation plans for nature reserves in China.
2013	Helped secure protected area status for Siberian Crane stopovers in northeast China.
2022	Eastern Population of Siberian Cranes reached the highest numbers recorded to date: approximately 5,500 individuals.

鄱阳湖国家级自然保护区开展 2025 年“爱鸟周”宣传活动

侯雨琪
江西鄱阳湖国家级自然保护区管理局，南昌 330038

2025 年 4 月 1 日至 7 日，江西省第 44 届“爱鸟周”期间，江西鄱阳湖国家级自然保护区围绕″清除鸟网，密织法网，让鸟儿自由飞翔″主题，组织 11 个基层保护站联动司法、林业、教育等部门，深入校园、社区等场所开展了 14 场生态普法宣传活动，构筑起全民参与候鸟保护的坚实防线。

在校园活动中，保护区将鄱阳湖的生态奥秘转化为奇趣课堂，为湖区 8 所中小学、幼儿园的学生开设《白鹤的迁徙故事》、《鄱阳湖的生态密码》等特色课程。课堂上，自然讲师们通过视频展播、趣味问答等寓教于乐的形式，向学生普及候鸟习性及湿地保护意义；组织“手绘鄱阳湖”“扇子 DIY”“爱鸟手抄报”等创意活动，让孩子们用画笔描绘生态愿景；发放生态作业本、鸟类保护手册、候鸟主题魔方等宣传品，激发青少年争当“护鸟小卫士”的热情。

此外，各保护站联合司法、林业等部门，走进农贸市场、市民广场、乡镇集市，通过流动展板、鸟类标本展示、法律咨询台等形式，向群众讲解候鸟保护法律法规及非法捕猎危害；发放《候鸟保护手册》、环保围裙等宣传品；开展“清网行动”，动员志愿者清理湖区残留鸟网、垃圾，强化“保护红线不可触”的法治意识。

此次“爱鸟周”活动通过校园科普与社区普法相结合，有效提升了公众对候鸟保护的认知度，营造了全民参与保护鸟类等野生动物资源的良好氛围，助力爱鸟护鸟的理念在更多人心中生根发芽。

图 1. 万年站走进万年县第一小学组织学生手绘“爱鸟周”手抄报
Figure 1. Students at Wannian County No. 1 Elementary School work on bird-loving handwritten newspapers, organized by Wannian Management and Monitoring Station of Poyang Lake National Nature Reserve

图 2. 沙湖站走进恒丰中心幼儿园为小朋友们送上了一堂寓教于乐的自然教育课
Figure 2. A staff member from Sha Hu Management Station of Poyang Lake National Nature Reserve gives a lecture on nature to kindergarteners at Hengfeng Central Kindergarten

图 3. 进贤站联合进贤县林业局、公安森林分局、三里乡人民政府在三里乡集贸市场讲解有关保护知识和法律法规
Figure 3. Staff members from Jinxian Management and Monitoring Station of Poyang Lake National Nature Reserve, together with Jinxian Forestry Bureau, Police Department, and Sanli Township Government visit local markets to explain conservation knowledge, policies and laws

Celebrate 2025 Bird-Loving Week at Poyang Lake

Hou Yuqi
Jiangxi Poyang Lake National Nature Reserve, Nanchang 330038

The 44th Bird-Loving Week was celebrated from April 1 to 7, 2025 at Poyang Lake by Jiangxi Poyang Lake National Nature Reserve. Eleven management stations at the reserve, cooperating with other government agencies of judicial, forestry, education etc., around Poyang Lake conducted 14 activities on ecological regulations and policies in schools, local communities and other places.

In schools, the reserve staff members offered activities such as "The Migration Story of Siberian Cranes" and "The Ecology of Poyang Lake" for students in 8 primary and secondary schools and kindergartens in the lake area. In the classroom, the reserve educators taught lecturers on the habits of migratory birds and the significance of wetland protection to students through video shows, discussions and other interesting forms; organized creative activities such as "Hand-painted Poyang Lake", "Fan DIY", "Bird-loving Handwritten Newspaper", etc., allowing children to use pencils and brushes to depict ecological visions; and distributed homework notebooks, bird books, migratory bird theme magic cubes and other publicity materials to inspire young people to become "little bird protectors".

In addition, each management station, working with the judicial, forestry and other departments, went to farmers' markets, city squares, and township markets to explain the laws and regulations on migratory bird protection and the harm of illegal hunting to the public through mobile display boards, bird specimen displays, legal consultation booths and other forms; distributed "Migratory Bird Protection Manual" and other publicity materials; carried out "Bird Net Cleaning Action", mobilizing volunteers to clean up the remaining bird nets and garbage in the lake area, and strengthened the legal awareness.

This "Bird-Loving Week" event effectively enhanced the public's awareness of migratory bird protection by combining schools with community in law/policy education, created a good atmosphere for the participation of all people in protecting birds and other wildlife resources, and helped spread the concept of loving and protecting birds to more people.

****

鄱阳湖国家级自然保护区开展“候鸟北迁护飞·志愿同行”行动

黄莎
江西鄱阳湖国家级自然保护区管理局，南昌 330038

随着春回大地，气温渐升，鄱阳湖迎来候鸟北迁的关键时期。为守护候鸟迁徙通道安全，鄱阳湖

保护区统筹各基层站，联合民间志愿组织和志愿者，全面启动“候鸟北迁护飞·志愿同行”专项行动。在这场生态保卫战中，志愿者和民间护鸟组织以行动诠释责任担当，成为守护候鸟家园的重要力量。

1. 志愿力量薪火相传 民间护鸟筑牢防线

鄱阳湖作为东亚－澳大利西亚候鸟迁飞网络的重要节点，不仅是候鸟越冬的理想栖息地，也是它们北迁前的重要“补给站”。多年来，活跃在湖区一线的志愿组织和护鸟志愿者，始终是生态保护的重要补充力量。他们凭借扎根基层、分布广泛、行动灵活的优势，在巡护监测、栖息地维护、救护伤病候鸟、科普宣传等领域发挥了不可替代的作用。例如，都昌县鄱阳湖野生动物救护协会常年开展湖区巡护，西源乡小天鹅保护协会通过“村民护鸟公约”凝聚社区共识，鄱阳县摄影家协会以影像传播生态保护理念……这些民间力量与保护区紧密协作，形成了“政府主导、社会参与、全民行动”的候鸟保护格局。

2. 全民护飞同心同行 志愿行动守护迁徙路

在此次“候鸟北迁护飞·志愿同行”行动中，鄱阳湖保护区各基层站充分调动民间志愿力量，强化候鸟保护网络。都昌站联合县林业局、都昌候鸟保护区等部门，联动都昌县鄱阳湖野生动物救护协会、西源乡小天鹅保护协会、苏山乡达子咀苍鹭保护协会、多宝乡大雁保护协会、都昌县鄱阳湖生态摄影协会等多个民间组织，展开拉网式巡查，共同开展隐患排查、座谈交流、联合宣传等工作；鄱阳站组织 30 余名志愿者深入长山岛、白沙洲等湖区腹地，清理废弃网具和垃圾，向湖区群众宣传湿地候鸟保护知识，用行动传递生态保护理念；大湖池站连续 5 天组织 10 余名志愿者共同到湖区开展清网行动，清理废弃地笼、渔网等影响候鸟栖息的障碍物。

3. 长效机制持续赋能 共绘人鸟和谐新图景

为巩固护飞成果，鄱阳湖保护区着力构建志愿护鸟长效机制。一方面，通过联合保护委员会评估，鼓励工作突出的民间组织、志愿者，激发民间参与保护工作的热情；另一方面，通过组织开展鸟类识别、救护技能等专业培训，提升民间护鸟队伍专业化水平。保护区将始终以开放姿态凝聚社会力量，让志愿精神与生态保护同频共振，让守护候鸟成为全民自觉，携手构筑一道坚实的生态屏障，为北迁候鸟铺就平安归途。

图 1. 大湖池站组织志愿者到湖区开展清网行动

Figure 1. Staff members from Dahu Chi Management Station of Poyang Lake National Nature Reserve, work with volunteers to remove nets

图 2. 都昌站联合民间组织开展湖区巡护工作。
Figure 2. Staff members from Duchang Management and Monitoring Station of Poyang Lake National Nature Reserve patrol in the field.

图 3. 鄱阳站联合退役军人志愿服务大队在湖区清理垃圾
Figure 3. Staff members from Poyang Management and Monitoring Station of Poyang Lake National Nature Reserve, working with military veteran volunteers, clean up garbage in the lake area

All people Guard Birds Migration Northwards launched at Poyang Lake

Huang Sha
Jiangxi Poyang Lake National Nature Reserve, Nanchang 330038

As spring returned to the earth and the temperature gradually rose in 2025, Poyang Lake came in a critical period for migratory birds to migrate northwards. To secure the safety of migratory bird migration, Poyang Lake National Nature Reserve coordinated its various management stations, working with non-governmental volunteer organizations and volunteers, and fully launched the "All people Guard Birds Migration Northwards" special campaign. In this activity, volunteers and non-governmental bird protection organizations took actions and played an important role in protecting the migratory bird homeland.

1. Work with local volunteer groups in migratory bird protection

As an important place in the East Asia-Australasian migratory bird flyway, Poyang Lake is not only an ideal habitat for migratory birds to winter, but also an important "staging station" before many migratory birds migrate north. Over the years, volunteer organizations and their volunteers active in the lake area have always been an important drive for ecological protection. With their advantages of being rooted in the local communities, widely distributed, and flexible in action, they have played an irreplaceable role in patrol monitoring, habitat protection, rescue of injured migratory birds, and popular science publicity. For example, the Poyang Lake Wildlife Rescue Association of Duchang County patrols the lake area all year round, the Little Swan Protection Association of Xiyuan Township obtains community consensus through the "Villager Bird Protection Commitments", and the Poyang County Photographers Association spreads the concept of ecological protection through photographs... These private organizations work closely with the reserve to form a migratory bird protection practice of "government-led, social participation, and the public action".

2. Clear fishing nets, garbage and other harmful materials

In this "All people Guard Birds Migration Northwards" activity, management stations of Poyang Lake

National Nature Reserve fully mobilized the volunteers to form an effective migratory bird protection network, which was participated by Duchang Management Station of the reserve, County Forestry Bureau, Duchang Migratory Bird Reserve, Duchang County Poyang Wildlife Rescue Association, Xiyuan Township Little Swan Protection Association, Sushan Township Dazizui Heron Protection Association, Duobao Township Wild Goose Protection Association, Duchang County Poyang Lake Ecological Photography Association and other non-governmental organizations. Poyang Management Station of the reserve organized more than 30 volunteers to go to the lake area such as Changshandao and Baishazhou to clean up nets and garbage, publicize wetland migratory bird protection knowledge to the local people, and promote the concept of ecological protection with actions. Dahu Chi Management Station of the reserve organized more than 10 volunteers to go to the lake area for 5 consecutive days to carry out net clearing operations, clearing abandoned fishing cages, fishing nets and other materials that affect migratory birds.

3. Establish a long-term mechanism to empower bird protection volunteers

The Poyang Lake National Nature Reserve is working hard to establish a long-term mechanism for volunteer bird protection. On the one hand, it encourages outstanding non-governmental organizations and volunteers to promote the public participation in protection work; on the other hand, by organizing training such as bird identification and rescue skills, it helps enhance the technical skills for the private bird protection groups. The reserve will always be with open mind to let the volunteer spirit resonate with ecological protection, make the protection of migratory birds a conscious act of the public, and work together for a safe return journey for migratory birds migrating northward.

****

鄱阳湖国家级自然保护区开展"候鸟北迁护飞·联合攻坚"专项行动

黄莎
江西鄱阳湖国家级自然保护区管理局，南昌 330038

为保障候鸟安全北迁，近日，我局开展了″候鸟北迁护飞·联合攻坚″专项行动，通过多维立体化保护举措，为候鸟迁徙构筑坚实屏障。

行动期间，我局十一个基层站开展了为期三周的大排查，采用了“技防+人防”“空中+地面+水面”“日间+夜间”的全方位、多层次巡护模式。通过无人机在空中巡航，船只在水面排查，汽车和拖拉机在地面巡查，同时辅以徒步地毯式搜索，监控探头实时查看湖区情况等措施全方位保障了湖区安全稳定，确保越冬候鸟栖息安全。

行动期间，各保护站联合当地政府、相关业务部门、民间组织和志愿者开展了联合排查、普法宣传等大量扎实有效的行动，为候鸟北迁打下良好基础。

比如九江站结合百日攻坚计划，联合柴桑区林业局、港口街镇及护鸟员，共同深入到辖区内的四个主要湖泊，开展细致排查，拆除了 1 张可能威胁候鸟安全的菜地纱网，清理了 1 具大地笼和 1 具小地笼，有效消除候鸟迁徙途中的潜在威胁。都昌站联合县林业局、县候鸟保护局，陪同九江市委主要领导深入朱袍山水域和洞子李区域等重点区域，开展湖区调研工作和专项巡护排查。鄱阳站联合鄱阳县人民法院、人民检察院、林业局、市场监督管理局、农业农村局、森林公安局、鄱阳湖湿地公园管委会、渔政执法大队等单位，深入湖区重点乡镇、村庄开展联合排查，对排查中发现的废弃鸟网当场进行了拆除和焚毁，联合巡查组在排查过程中还同时开展了湿地候鸟保护宣传教育活动，提高湖区群众爱鸟护鸟意识。

此外，我局还依托无人机、高清摄像头、传感器和 AI 技术构建的智慧管理平台，实时对湖区情况进行全天候自动监测。通过智慧平台可以实时识别并记录候鸟种类、数量及分布密度，还能采用无人机扩大巡护监测范围，完成以前人力巡护难以到达的区域，高频次巡查浅滩、农田、沼泽地等隐患易发区域，结合 AI 算法推演候鸟活动规律，精准识别非法猎捕工具和人为干扰行为，及时预警，提升隐患清除效率。

此次“候鸟北迁护飞·联合攻坚”行动取得了显著成效：一是加强了部门联动，有效提升了湿地候鸟保护工作成效，对不法行为进行了有效打击，形成良好保护形势。二是清理了湖区遗留废弃物，

有效提高了候鸟栖息安全，为候鸟北迁打下良好基础。三是成功解救和救治了多只候鸟，降低了候鸟北迁过程中意外情况的发生。四是通过智慧监测系统实时掌握了候鸟迁徙情况，为保护工作提供了科学依据。五是提高了公众对候鸟保护的认识和参与度，营造了良好的社会氛围。

图 1. 九江站联合柴桑区林业局、港口街镇及护鸟员深入到辖区内的四个主要湖泊开展细致排查

Figure 1. Staff members from Jiujiang Management and Monitoring Station of Poyang Lake National Nature Reserve, working with Chaisang Forestry, Gangkou Town Government and bird guards, inspect sub lakes under the station

图 2. 都昌站联合县林业局、县候鸟保护局等深入朱袍山水域和洞子李区域等重点区域开展湖区专项巡护排查

Figure 2. Staff members from Duchang Management and Monitoring Station of Poyang Lake National Nature Reserve, working with Chaisang Forestry, Gangkou Town Government and bird guards, inspect key lake areas at Zhupaoshan and Dongzili

图 3. 鄱阳站联合鄱阳县人民法院、人民检察院、林业局、市场监督管理局、农业农村局、森林公安局、鄱阳湖湿地公园管委会、渔政执法大队等单位深入湖区重点乡镇、村庄开展联合排查

Figure 3. Staff members from Poyang Management and Monitoring Station of Poyang Lake National Nature Reserve, working with Forestry Department, County Court, County Inspection, Market Management Bureau, Ag Bureau, Forestry Police, Wetland Park Committee, and Fishery Enforcement Bureau etc., visit key towns and villages

Joint Action to Protect Birds Migration Northwards launched at Poyang Lake

Huang Sha
Jiangxi Poyang Lake National Nature Reserve, Nanchang 330038

In to ensure the safe northward migration of migratory birds in spring 2025, Poyang Lake National Nature Reserve recently launched a special action of "Joint Action to Protect Birds Migration Northwards".

During the activity, 11 management stations of the reserve used drones in the air, boats on the water, cars and tractors on the ground, and some members on foot, monitoring the lake area in real time for the safety and stability of the wintering migratory birds.

During the action, the management stations worked jointly with local governments, relevant technical departments, non-governmental organizations and volunteers on education of nature conservation laws and regulations, to help a safe northward migration of the migratory birds.

For example, Jiujiang Management Station of the reserve, worked with local forestry bureau, Gangkou Town government and bird guards to go to their four sub lakes in the jurisdiction, dismantled a vegetable field net that might threaten the safety of migratory birds, and cleaned up a large ground cage and a small ground cage, effectively eliminating potential threats to migratory birds during migration. Duchang Management Station, working with the county forestry bureau and the county migratory bird protection bureau, accompanied leaders of Jiujiang Municipal Party Committee to go to key areas such as Zhupaoshan and Dongzili to inspect the lake area. Poyang Management Station, working the Poyang County People's Court, the People's Procuratorate, the Forestry Bureau, the Market Supervision and Administration Bureau, the Agriculture and Rural Affairs Bureau, the Forest Public Security Bureau, the Poyang Lake Wetland Park Management Committee, the Fishery Law Enforcement Brigade and other units, went to key towns and villages in the lake area to carry out joint inspections, and dismantled abandoned bird nets found during the inspection. During the inspection, the joint inspection team also carried out wetland migratory bird protection publicity and education activities to raise the awareness of bird love and bird protection among the people in the lake area.

In addition, our nature reserve has relied on drones, high-definition cameras, sensors and other AI technology to conduct real-time and all-weather automatic monitoring of the lake area. Through the intelligent platform, the species, number and distribution density of migratory birds were identified and recorded in real time, also enabling us to expand the patrol monitoring range that were previously difficult to reach by human patrols. Combined with AI technology, the movement patterns of migratory birds could be deduced, illegal hunting tools and human interference behaviors could be identified, and timely warnings can be issued to improve the efficiency of removing hidden dangers.

The "Joint Action to Protect Birds Migration Northwards" has achieved remarkable results: First, it has strengthened inter-departmental coordination, effectively improved the effectiveness of wetland migratory bird protection, and effectively cracked down on illegal activities. Second, the garbage left in the lake area was cleaned up, effectively improving the habitat safety of migratory birds. Third, many migratory birds were successfully rescued and treated. Fourth, the migration of migratory birds was documented in real time through the smart monitoring system, providing a scientific basis for protection work. Fifth, the public's awareness and participation in migratory bird protection was improved, creating a good social atmosphere.

****

鄱阳湖国家级自然保护区开展“世界野生动植物日”宣教活动

侯雨琪
江西鄱阳湖国家级自然保护区管理局，南昌 330038

2025 年 3 月 3 日，在第 12 个“世界野生动植物日”到来之际，鄱阳湖保护区基层保护站以“加大物种保护投入力度，共建地球生命共同体”为主题，联合属地林业、公安、教育及公益组织等多方力量，以多样化形式开展系列宣教活动，凝聚全社会生态保护共识。

各基层站立足服务群众、扎根一线的职能定位，针对不同群体精准施策。在校园教育领域，通过“室内课堂+户外科普”双线融合，打造沉浸式自然教育体验。工作人员以“小鹤学堂”这一特色平台为载体，通过白鹤迁徙故事、互动问答等形式，生动解析白鹤的生存智慧，激发青少年“保护动植物就是保护未来”的责任意识，并鼓励青少年成为家庭、社区的生态传播者，通过“大手拉小手，小手拉大手”模式，形成“全民护鸟”的良好氛围。在社区民生领域，基层站深入农贸市场、社区街道、湖区村落等人员密集场所，开展“面对面”普法宣传。工作人员现场排查非法野生动物交易，向商户普及《野生动物保护法》，发放宣传手册及环保文创品，并以“以案释法”专栏揭示违法后果，以“润物细无声”的方式，引导群众自觉抵制捕猎、买卖行为，将生态文明种子播撒在群众心间。

展望未来，鄱阳湖保护区将深化“政府主导、社会协同、公众参与”长效机制，持续推进基层宣教网络建设，创新宣传方式，拓宽参与渠道，让生态保护的理念深入人心，成为全社会的共识与行动。

图 1. 大湖池站工作人员在小鹤学堂为吴城小学学生讲解候鸟知识
Figure 1. Staff members from Dahu Chi Management Station of Poyang Lake National Nature Reserve talk about migratory birds to students at Wucheng Elementary School

图 2. 吴城站工作人员上“白鹤”主题的自然教育课
Figure 2. Staff members at Wucheng Station of Poyang Lake National Nature Reserve give a lecture about Siberian Cranes to local students

图 3. 余干站工作人员走进沿湖社区向居民科普湿地与候鸟保护知识
Figure 3. Staff members from Yugan Management and Monitoring Station of Poyang Lake National Nature Reserve go to local villages to explain about wetland and migratory bird conservation

World Wildlife Day Celebration at Poyang Lake

Hou Yuqi
Jiangxi Poyang Lake National Nature Reserve, Nanchang 330038

On March 3, 2025, the 12th World Wildlife Day was celebrated by management stations of Poyang Lake National Nature Reserve at Poyang Lake. The celebration was conducted jointly with local forestry, public security, education and other social organizations.

In schools, celebration activities included telling stories of crane migration, crane survival skills, and discussions, promoting young people's responsibility of protecting animals and plants for the future, and encouraged young people to communicate with their families and communities on nature conservation. Staff from management stations of the reserve visited farmers' markets, townships and villages to carry out nature conversations. The station staff investigated illegal wildlife trading activities in these places, educated the "Wildlife Protection Law" to the traders, distributed environmental protection brochures, improved the public of fighting poaching and trading wildlife, and helped local people to become good citizens for ecological conservation.

Looking into the future, the Poyang Lake National Nature Reserve will deepen the long-term mechanism of "government-led, society coordination, and public participation", continue to promote the construction of grassroot organizations and education networks, innovate propaganda methods, broaden participation channels, and make ecological conservation become the consensus and action of the whole society.

****

白鹤 S25 的传奇故事

侯博
国际鹤类基金会，美国

在浩瀚的天空中，白鹤以其优雅的身姿和坚韧的迁徙之旅，成为了大自然的传奇。而在这群迁徙者中，有一只雌性白鹤，她用生命书写了一段令人动容的故事。她就是 S25，一个让无数人铭记的名字，一个关于勇气、坚韧与希望的象征。

图 1. 戴环志的 S25（全国鸟类环志中心提供照片）
Figure 1. S25 with banding (Photo provided by National Bird Banding Center, NBBC)

1. 生命的转折：救助与重生

2017 年 10 月 21 日，吉林莫莫格国家级自然保护区的清晨，阳光透过薄雾洒在广袤的湿地上。这一天，国际鹤类基金会（ICF）前副主席吉姆·哈里斯（Jim T. Harris）和全国鸟类环志中心副主任江红星，正在莫莫格进行秋季白鹤和其他迁徙水鸟的同步调查。这已经是他们第六年沿着白鹤东部群体的迁徙路线，踏上这段充满挑战的旅程。

然而，就在调查过程中，一个意外的发现让所有人的心揪了起来。在莫莫格的一片小湿地边缘，一只白鹤虚弱地躺在那里，仿佛已经精疲力竭。吉姆和江红星迅速上前查看，经过仔细检查，他们发现这只白鹤是因为长途迁徙和食物匮乏而变得虚弱。她的眼神中透着无助，却又闪烁着对生命的渴望。

图 2. S25 环志后释放（全国鸟类环志中心提供照片）
Figure 2. S25 releasing (Photo provided by NBBC)

“我们必须救她!”吉姆坚定地说。于是，吉姆、江红星以及莫莫格保护区的工作人员小心翼翼地将这只白鹤带回了保护区的救助站。在接下来的一周里，工作人员们日夜守护，精心照料。他们为她补充营养，就像照顾自己的家人一样。终于，在 2017 年 10 月 27 日，这只白鹤完全康复了。她佩戴着编号为 S25 的环志和卫星追踪器，重新展翅飞向了大自然。那一刻，阳光洒在她的身上，仿佛为她披上了一层金色的战袍。她的旅程才刚刚开始，而这一切，也为科学家们提供了珍贵的研究机会。

2. 奇迹的旅程：创纪录的迁徙

S25 的迁徙之旅，是一场充满挑战与奇迹的旅程。经过长达 6 年 55 天的跟踪，她的故事成为了白鹤迁徙史上的传奇。

首先，她是已知卫星跟踪时间最长的白鹤。从 2017 年 10 月 27 日到 2023 年 12 月 20 日，2246 天的迁徙生活，她经历了无数的艰难险阻。在这段时间里，她跨越了高山、河流、沙地，面对着恶劣的天气和未知的危险。然而，她凭借着惊人的生存能力和适应能力，一次次地突破极限。

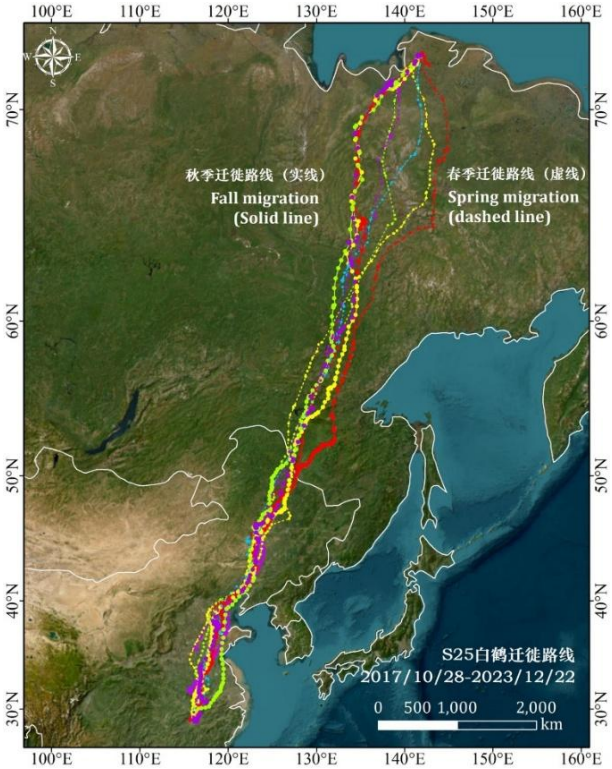


图 3. S25 的迁徙路线（全国鸟类环志中心提供照片）
Figure 3. Migration route of S25 (Photo provided by NBBC)

2021 年 10 月 6 日，S25 和她的家族在东北松嫩平原和辽河平原遭遇了一场突如其来的暴风雪。气温骤降 15℃，白鹤们被困在了寒冷的北方，无法及时南迁。然而，S25 并没有被困难吓倒。11 月 9 日，她与配偶和幼鹤一起，果敢地迎着暴风雪向南迁徙。那是一场与时间赛跑的旅程，她用 62 小时完成了 2200 公里的迁飞，中途仅停歇一次，耗时 16 小时。这一壮举不仅令人惊叹，也刷新了白鹤单次连续飞行的记录——37 小时飞行 1700 公里，平均时速达 46 公里/小时。在那漫长的飞行中，她凭借着坚定的信念和顽强的毅力，克服了常人难以想象的困难。她的翅膀在风雪中划出一道道优美的弧线，仿佛在向世界宣告，生命的力量是如此强大。

图 4. 暴风雪中的鹤群。全国鸟类环志中心提供照片
Figure 4. Crane flocks in snow storm (Photo provided by NBBC)

3. 温暖的陪伴：家庭的力量

在这漫长的迁徙之路上，S25 并不是孤独的。2020 年 11 月 18 日，鄱阳湖监测记录了 S25 一家三口的珍贵影像。画面中，S25 和她的配偶、幼鹤紧紧相依，它们在湖边漫步，享受着难得的宁静时光。那一刻，我们看到了白鹤在迁徙途中对家庭的坚守与陪伴。无论面对多大的困难，她们始终不离不弃，共同面对。这种家庭的力量，让 S25 在艰难的旅程中有了坚持下去的勇气。她们一起分享食物，一起抵御危险，一起迎接每一个黎明和黄昏。S25 用自己的行动，诠释了什么是爱与责任。

图 5. S25 与其家庭在鄱阳湖。全国鸟类环志中心提供照片
Figure 5. S25 and her family wintering at Poyang Lake (Photo provided by NBBC)

4. 最后的告别：永恒的纪念

然而，命运总是充满了无常。2023 年 12 月 20 日，S25 的跟踪器卫星信号突然显示异常。12 月 25 日，江西鄱阳湖国家级自然保护区的工作人员怀着忐忑不安的心情前往现场核实，但遗憾的是，他们未能找到 S25。直到 12 月 30 日，专家和志愿者们通过无人机确认并成功打捞了 S25 的遗体。经过检查，她身体无外伤，也没有中毒的迹象，具体死因尚待进一步研究。

图 6. 最后一次见到 S25 在湿地的场景（全国鸟类环志中心提供照片）
Figure 6. The last of S25 in wetland (Photo provided by NBBC)

S25 的离去，让无数人感到惋惜和不舍。她的生命虽然画上了句号，但她的故事却成为了永恒的纪念。她不仅是一个关于迁徙和生存的传奇，更是对白鹤保护工作的重要贡献。她的迁徙数据为科学家提供了珍贵的研究资料，帮助我们更好地了解白鹤的生态需求和迁徙路线。同时，她的故事也让我们铭记吉姆·哈里斯先生的贡献。作为国际鹤类基金会的资深副主席，他一生致力于保护白鹤及其他濒危物种。S25 的旅程，是他留给世界的最后礼物。

图 7. S25 环志团队（右 3 为吉姆，全国鸟类环志中心提供照片）
Figure 7. Banding team photo of S25 releasing (right 3 is Jim, Photo provided by NBBC)

如今，经过科学的处理，S25 的标本已经制作完成，并在江西鄱阳湖国家级自然保护区吴城站的宣教馆展出。她静静地站在那里，仿佛在诉说着自己的故事。我们希望通过 S25 的故事，让更多人了解白鹤迁徙的艰辛，也希望她的勇气和坚韧能激励更多的人加入到白鹤保护的行列中来。

图 8. S25 标本（国际鹤类基金会提供）
Figure 8. Specimen of S25 (Photo by International Crane Foundation)

S25，你的生命虽然短暂，但你的精神将永远闪耀在我们心中。你用生命诠释了什么是坚韧与希望，你让我们相信，只要我们共同努力，就能守护这片美丽的家园，让更多的白鹤在天空中自由翱翔。

The Legend of S25: The Resilience and Hope of the Siberian Crane

Hou Bo
International Crane Foundation, USA

In the vast sky, the Siberian Crane, with its graceful figure and tenacious migratory journey, has become a legend of nature. Among these migratory birds, there is a female Siberian Crane whose life has written a touching story. She is S25, a name remembered by countless people, a symbol of courage, resilience, and hope.

1. A Turning Point in Life: Rescue and Rebirth

On the morning of October 21, 2017, sunlight filtered through the mist over the expansive wetlands of the Momoge National Nature Reserve in Jilin. On this day, Jim T. Harris, former vice president of the International Crane Foundation (ICF), and Jiang Hongxing, deputy director of the National Bird Banding Center, were conducting a synchronized survey of Siberian Cranes and other migratory waterbirds during the autumn season. This was already their sixth year following the migration route of the eastern population of Siberian Cranes, embarking on this challenging journey.

However, during the survey, an unexpected discovery gripped everyone's hearts. At the edge of a small wetland in Momoge, a female Siberian Crane lay weakly, seemingly exhausted. Jim and Jiang Hongxing quickly approached to examine her. After a careful check, they found that the crane had become weak due to the long migration and lack of food. Her eyes reflected helplessness, yet they also sparkled with a desire to live.

"We must save her!" Jim said firmly. So, Jim, Jiang Hongxing, and the staff of the Momoge National Nature Reserve carefully brought the crane back to the rescue station. Over the next week, they worked day and night, providing meticulous care. They nourished her, treated her wounds, and cared for her as if she were family. Finally, on October 27, 2017, the crane recovered. She was fitted with a band labeled S25 and a satellite tracker, and she spread her wings to return to the wild. At that moment, the sunlight bathed her, as if cloaking her in golden armor. Her journey had just begun, and it provided scientists with a precious research opportunity.

2. A Journey of Miracles: Record-Breaking Migration

S25's migration was a journey filled with challenges and miracles. After 6 years and 55 days of tracking, her story became a legend in the history of Siberian Crane migration.

First, she is the Siberian Crane with the longest-known satellite tracking period. From October 27, 2017, to December 20, 2023, she lived through 2,246 days of migration, facing countless hardships. During this time, she crossed mountains, rivers, and deserts, braving harsh weather and unknown dangers. Yet, with incredible survival skills and adaptability, she repeatedly pushed her limits.

On October 6, 2021, S25 and her family encountered a sudden snowstorm in the Songnen and Liaohe Plains of northeastern China. The temperature dropped by 15°C, trapping the cranes in the cold north, unable to migrate south in time. However, S25 was not deterred by the difficulties. On November 9, she, along with her mate and young crane, boldly headed south into the snowstorm. It was a race against time. She completed a 2,200-km migration in 62 hours, stopping only once for 16 hours. This feat not only amazed observers but also broke the record for the longest continuous flight by a Siberian Crane—37 hours covering 1,700 kilometers, averaging 46 km/h. During that long flight, she overcame unimaginable difficulties with unwavering determination and resilience. Her wings carved graceful arcs in the snowstorm, as if declaring to the world the immense power of life.

3. Warm Companionship: The Power of Family

On this long migratory journey, S25 was not alone. On November 18, 2020, monitoring at Poyang Lake captured precious footage of S25 and her family of three. In the images, S25, her mate, and their young crane stood close together, strolling by the lake, enjoying a rare moment of peace. In that moment, we saw the Siberian Crane's commitment to family during migration. No matter the challenges, they never left each other,

facing everything together. This family bond gave S25 the courage to persevere through the difficult journey. They shared food, defended against dangers, and welcomed each dawn and dusk together. S25's actions exemplified love and responsibility.

4. The Final Farewell: An Eternal Memory

However, fate is often unpredictable. On December 20, 2023, S25's satellite tracker suddenly showed abnormal signals. On December 25, staff from the Jiangxi Poyang Lake National Nature Reserve anxiously went to investigate, but unfortunately, they could not find S25. It wasn't until December 30 that experts and volunteers confirmed and successfully retrieved S25's remains using a drone. After examination, she showed no external injuries or signs of poisoning, and the exact cause of death remains under investigation.

S25's passing left countless people heartbroken. Although her life has ended, her story remains an eternal memory. She is not only a legend of migration and survival but also a significant contribution to the conservation of Siberian Cranes. Her migration data provided scientists with valuable research material, helping us better understand the ecological needs and migration routes of Siberian Cranes. At the same time, her story reminds us of the contributions of Jim T. Harris. As a senior vice president of the International Crane Foundation, he dedicated his life to protecting Siberian Cranes and other endangered species. S25's journey was his final gift to the world.

Today, after scientific processing, S25's specimen has been completed and is on display at the education center of the Wucheng Station in the Jiangxi Poyang Lake National Nature Reserve. She stands there quietly, as if telling her story. We hope that through S25's story, more people will understand the hardships of Siberian Crane migration, and that her courage and resilience will inspire more people to join the cause of protecting these magnificent birds.

S25, your life may have been short, but your spirit will forever shine in our hearts. You have shown us the meaning of resilience and hope. You have made us believe that as long as we work together, we can protect this beautiful home and allow more Siberian Cranes to soar freely in the sky.

鹤舞扎龙

孙建新
齐齐哈尔建华机械有限公司，黑龙江 161006

在祖国的北疆，有一座美丽的城市——齐齐哈尔。齐齐哈尔是中国首个聚焦鹤类保护的国家级自然保护区——扎龙的诞生地。扎龙保护区位于黑龙江省齐齐哈尔市，由乌裕尔河下游流域的一大片永久性、季节性淡水沼泽地和无数小型浅水湖泊组成，主要保护对象为丹顶鹤等珍禽及湿地生态系统。保护区占地总面积 21 万公顷，有大面积的芦苇湿地。保护区内湖泽密布，苇草丛生，是水禽等鸟类栖息繁衍的天然乐园。目前世界上共有鹤类 15 种，中国有 9 种，扎龙有 6 种。全世界丹顶鹤 2000 多只，扎龙就有 400 多只，为国家一级重点保护野生动物。

1. 吉祥“仙鹤”

丹顶鹤也叫仙鹤，中国古籍文献中对丹顶鹤有许多称谓，如南宋动植物学家罗愿撰写的《尔雅翼》中称其为"仙禽"，明朝医学家李时珍所著的《本草纲目》中称其为"胎禽"。丹顶鹤是鹤类的一种，为大型涉禽，成鸟体长约 160 厘米，翼展约 240 厘米，体重约 10 千克。丹顶鹤全身几乎为纯白色，头顶裸露无羽毛，为朱红色，额和眼先微具黑羽，眼后方耳羽至枕为白色，颊、喉和颈为黑色；次级飞羽和三级飞羽为黑色，三级飞羽长而弯曲，呈弓状覆盖于尾上，因此站立时尾部黑色，实际是三级飞羽，而尾羽、初级飞羽和整个体羽为白色，飞翔时极为明显；嘴较长，呈淡绿灰色，脖颈和腿都很长，两翅中间长而弯曲的飞羽为黑色，站立时整个飞羽都覆盖在尾部，常常使人误认为它有一个黑色的尾羽。丹顶鹤的骨骼外坚内空，强度非常大，在飞行迁徙的时候，常常排成巧妙的楔形队伍，好让后面的个体能够依次利用前面个体扇动翅膀时所产生的气流，从而快速、省力、持久的飞行，时速可达每小时 40 公里左右，飞行高度超过 5400 米以上。

丹顶鹤在中国历史上被认为是一等“文禽”，明朝和清朝给丹顶鹤赋予了忠贞不渝、清白清正、品德高尚的文化内涵。“一品”文官的补服上绣“丹顶鹤”，使其成为仅次于皇家专用“龙凤”的重要标识，因而人们也称丹顶鹤为“一品鸟”视作高官厚禄的象征。一幅鹤立潮头岩石上的吉祥图纹，取“潮”与“朝”的谐音，象征着像宰相一样“一品当朝”；仙鹤在高空展翅飞翔的图纹，象征着指日可待、“一品高升”；旭日东升、霞光万道、仙鹤飞翔的图纹，象征着鸿运当头、“指日高升”。实际上，丹顶鹤是生活在沼泽或浅水地带的一种大型涉禽，被人们冠以“湿地之神”的美称。丹顶鹤与生长在高山丘陵中的松树毫无关系，但是由于丹顶鹤在鸟类中寿命长，文人墨客就常把它和松树绘在一起，为他起了个吉祥题款叫《松鹤延年》，作为人们对健康长寿的美好祝愿。

2. 和谐“仙鹤”

丹顶鹤作为大型候鸟，每年春季 2 月末 3 月初离开越冬地江苏盐城，3 月中旬经过北戴河短暂停留休整后，4 月中上旬到达齐齐哈尔扎龙自然保护区，在这里繁衍生息，养育后代。秋季来临时，丹顶鹤离开扎龙自然保护区向南迁徙，小群经北戴河最早 10 末到达越冬地，大群在 11 月下旬抵达江苏盐城。迁徙时，在空中组成“V”字形团队飞行。丹顶鹤常成对或以家族小群的形式活动，在冬季和迁徙季节，经常由数个或数十个家族群结成较大的团体，有时集群数量多达 40、50 只，甚至 100 只以上。但活动时仍在一定区域内分散成小群或家族群活动。

丹顶鹤夜间多栖息于四周环水的浅滩上或苇塘边，彼此按家族群分散栖息。天气特别冷时，则靠得很近抱团取暖。丹顶鹤觅食地和夜间栖息地一般较为固定，通常天亮后，各家族群陆续飞到觅食地觅食，彼此间保持一定距离；中午时，多集中在滩边休息，并不断地发出鸣叫声。傍晚时，又陆续飞回或留在觅食地过夜。休息时，丹顶鹤经常单腿站立，头转向身后插于背部羽毛之间。无论觅食或休息时，常有 1 只成年丹顶鹤负责站岗放哨，这只丹顶鹤特别警觉，不断抬头四外张望，发现危险时头颈往上伸直，仰天鸣叫，给其它丹顶鹤发出警示。当危险逼近时，则迅速腾空而起，带领其它丹顶鹤快速离开。

丹顶鹤飞翔时头脚前后伸直，两翅缓慢鼓动，姿态非常优美。丹顶鹤叫声高亢、宏亮，与其特殊的发音器官有关。它的脖颈长，气管也长，长约 1 米以上，是人类气管长度的五六倍，末端卷成环状，

盘曲于胸骨之间，就像西洋乐器中的铜管一样，发音时能够引起强烈的共鸣，声音可以传到 3 至 5 公里以外。每年的 3、4 月份，丹顶鹤到达繁殖地后不久，便开始谈情说爱、成双配对、占领巢穴领域，雄鸟和雌鸟通过在巢域内的不断鸣叫，宣布对领域的占有，求偶时也伴随着鸣叫，而且常常是雄鸟嘴尖朝上，昂起头颈，仰向天空，双翅耸立，引吭高歌，发出“呵，呵，呵”的嘹亮声音。雌鸟则高声应和，然后彼此相互对鸣、奔跑跳跃，在我们眼前呈现出好一幅相亲相爱的温馨和谐画面。

3. 鹤舞“扎龙”

丹顶鹤的舞蹈姿态优美，高贵典雅，风格独特，婀娜多姿，落落大方。它们独舞亭亭玉立、身姿矫健，双鹤共舞时，温馨对望、遥相呼应；集体起舞时，千姿百态、各领风骚，表演起来让人目不暇接、流连忘返、久久不愿离去。丹顶鹤的舞蹈是很多动作的连续变幻，舞蹈的主要姿态有伸腰抬头、直立弯腰、跳跃踢腿、展翅行走、屈背鞠躬、跳跃衔物等等。姿势幅度、节奏快慢、花样动作各有千秋，舞蹈表演姿势十分优美，或伸颈扬头，或曲膝弯腰，或原地踏步，或跳跃腾空，有时还会叼起小石子或小树枝高高地抛向空中玩耍。而这些动作及其后续姿态，又都有机地结合在一起，如弯腰前行、伸腰抬头、头部急速上下摆动；展翅欲飞、伸腰抬头、弯腰屈膝；伸腰远望、弯腰拾物、腿脚朝下展翅跳跃；展翅弯腰、弯腰行走、颈部和身体呈“八”字形展翅衔物、蹒跚学步；空中衔物、登高跳跃、不变位置的身体旋转，依靠腿部力量或扇动翅膀做腾空跳跃以及弯腰奔跑等等，这些动作大多都有比较明确的目的。例如弯腰鞠躬一般表示友好亲近和浪漫爱情；全身绷紧的低头敬礼，有表示自身的存在、炫耀、恐吓之意；弯腰展翅则表示怡然自得、休闲漫步、消遣娱乐；展开亮丽翅膀，表示开心快乐、无忧无虑、心情畅快之意。

总而言之，丹顶鹤需要洁净而开阔的湿地环境作为栖息地，是湿地环境变化最为敏感的指标性生物。通过影友孙建新拍摄的《鹤舞扎龙》摄影作品（见本期封二和封三的图片），能够唤起人们观鸟、爱鸟、拍鸟、更要保护鸟的意识；珍惜湿地、爱护湿地、更要保护湿地；自然是我们共同的栖息之地，更是我们共同生活的美好家园；爱护自然、珍惜自然、保护自然，就是保护我们人类自己。

现在，保护丹顶鹤及其生存环境的重要性已经为越来越多的人们所关注。我国已经建立起的以保护丹顶鹤为主题的自然保护区已经超过 18 个，其中齐齐哈尔的扎龙自然保护区早已被列入《关于特别是作为水禽栖息地的国际重要湿地公约》，纳入中国首批《国际重要湿地名录》之中，使湿地保护工作取得了重大进展，并成为国家 AAAA 级旅游景区，吸引了全国乃至世界各地的游客以及专家学者前来进行考察和旅游观光。

Red-crowned Cranes Dancing at Zhalong

Sun Jianxin
Qiqihar Jianhua Machinery Company，Heilongjiang 161006

Red-crowned Crane, called a fairy bird, plays an important role in Chinese history, occurred in many ancient Chinese literature. It was considered a first-class "civilized bird" in Chinese history as the Ming and Qing dynasties endowed it with cultural connotations of loyalty and noble character. The Red-crowned Crane has nothing to do with the pine trees. However, because the Red-crowned Crane has a long lifespan among birds, artists and scholars often paint it together with pine trees and give it an auspicious title called "Pine and Crane Longevity" as a symbol of people's good wishes for health and longevity.

In northern China, there is a beautiful city - Qiqihar. Qiqihar is the birthplace of Zhalong National Nature Reserve, China's first national nature reserve focusing on crane protection. Zhalong Nature Reserve consists of a large area of permanent and seasonal freshwater marshes and shallow lakes in the lower reaches of the Wuyur River. There are currently 15 species of cranes in the world, 9 of which are in China and 6 in Zhalong. There are more than 2,000 Red-crowned Cranes in the world, 400 of them living 400 in Zhalong.

Through the photography work "Crane Dancing in Zhalong" taken by photographer Sun Jianxin (see photos in insider front and back covers of this newsletter), it can arouse people's awareness of bird watching, bird love, bird photography, and bird protection, as well as love wetlands and nature.

【输电线路、新能源与鹤类】
[Powerline, New Energy, and their Relation to Cranes]

2024-2025 越冬季西藏黑颈鹤误撞输配电线情况不完全调查简报

李欣桐 郭玉民
北京林业大学生态与自然保护学院/国家公园学院，北京 100091

近年来，为满足不断增长的电力需求，中国已建成全球最长的输配电线路和最复杂的电网系统。然而，输配电线路的扩建也带来了一些生态环境方面的问题，其中对鸟类生存的影响尤为突出。输配电线不仅会切割鸟类的栖息地，还可能导致鸟类误撞或感电而伤亡。因此，关注鸟类与架空输配电线的冲突，评估输配电线对鸟类生存的影响，并探索可能的缓解措施，已成为维护良好生态系统，遵循可持续发展必不可少的课题。

黑颈鹤（*Grus nigricollis*）主要分布于中国，是中国国家一级重点保护野生动物，其全球总数约为 1.8 万只左右。由于黑颈鹤种群数量在缓慢增长，国际自然保护联盟（IUCN）红色名录于 2020 年将黑颈鹤的受胁等级由易危（VU）降为近危（NT）。尽管如此，误撞输配电线导致死亡仍是影响黑颈鹤种群数量的一大问题。鉴于这种情况，我们前往西藏地区的墨竹工卡县和林周县等黑颈鹤主要越冬区域，开展了专门的调查。

2024 年 12 月 25 日至 2025 年 1 月 7 日，我们在西藏自治区拉萨市墨竹工卡县唐加乡周边，以及林周县西侧的卡孜乡与强嘎乡进行实地调察（图 1，2）。期间，共发现 30 只因输配电线致伤致死的个体（图 3，4），除了 1 号个体在被发现后及时送往县林草局接受救治外，其他受伤个体因河水阻隔，无法得到及时救助。

对墨竹工卡的撞击输电线事件进一步分析发现，误撞事件多发生在有输配电线分布的农田与河流浅滩处。调查显示，伤亡高发的地区主要在输配电线较为密集的黑颈鹤觅食地附近，或黑颈鹤往来于夜栖地和觅食地的必经之路上。由于黑颈鹤在昏晨或者天气不佳情况下飞行时视力受限，会大大增加撞击输配电线的风险。与此同时，区域内的捕食者（例如狐 *Vulpes* spp.、家犬等）较多，黑颈鹤的受伤个体或者尸体常被迅速拆解、搬运（图 5，6），导致现场勘查和伤亡统计的难度非常大。

在林周县黑颈鹤撞击输电线的高发区域进行调查发现，距离夜栖地东侧不到 1 km 处，存在 220kv 和 400kv 两条平行的输电线路，仅在此线路下方就发现 8 只黑颈鹤死亡个体，以及一些斑头雁（*Anser indicus*）、赤麻鸭（*Tadorna ferruginea*）的死亡个体。我们在平行输电线东侧 400 m 左右，发现了黑颈鹤集群的觅食地。该地黑颈鹤群体在上午 9-11 点之间从彭曲流域的夜栖地出发前往觅食地，19-20 点之间从觅食地集体返回夜栖地。这两条平行输电线路其中几个档（电塔之间）没有安装任何警示装置，最终成为了导致它们伤亡的主要肇事线段。

根据以上情况，我们在春节后又进行了为期 49 天的调查。2024-2025 越冬季，在西藏黑颈鹤主要越冬地通过不完全调查累计确认因撞击死伤的黑颈鹤个体共 88 只（全部有图或视频证据），其中包括 2 只佩戴卫星跟踪器的个体。如此数量的伤亡，充分说明输配电线是威胁该区域黑颈鹤种群安全的重大因素。这也将是高原生态系统稳定性的严重隐患。尽管有关部门已对附近一部分输配电线加装了警示装置，但依然没能阻止悲剧的持续发生。建议有关部门尽快行动，加快对调查区域的输配电线警示装置的加装速度，以减少后续的伤亡。同时也建议不要在该区域进行更多的输配电线的规划，以免误撞事件更加严重。

图 1. 墨竹工卡县黑颈鹤伤亡位点分布
Figure 1. Sites of crane casualties in Mozhugongka County

图 2. 林周县黑颈鹤伤亡位点分布
Figure 2. Sites of crane casualties in Linzhou County

图 3. 1 号.在农田发现的右腿断裂的个体（已救助，但五天后死亡）；2 号在农田发现的双腿完全断裂的个体（已被捕食）；3 号在浅滩发现的左腿断裂的个体；4-6 号在河谷中央浅滩发现的三只瘸腿个体；7 号在河谷浅滩中发现的死亡个体；8 号在农田中发现的左腿断裂个体（已被捕食）；9 号在农田中发现的死亡个体（已被啃食）。李欣桐 摄

Figure 3. 1 – A crane with a broken right leg found in a farmland (rescued, but died five days later); 2 – A bird with both legs completely broken found in a farmland (already half eaten); 3 – A bird with a broken left leg found in a shallow beach; 4-6, Birds with leg-broken found in a shallow water; 7 – A bird found in a shallow water; 8 – A bird with a broken left leg in a farmland (already eaten); 9 -- A dead crane found in a farmland (already eaten). Photos by Li Xintong.

图 4. 10 号在水池中打捞出来，左翅受伤，足部折断；11 号输配电线下的右翅残骸；12 号左翅折损，双腿折断；13 号输配电线下的右翅残骸；14 号输配电线下的一对翅膀残骸；15 号右翅折断，腿部折断；16 号右翅折断；17 号左翅折断，右腿骨折断；18 号死于觅食地水中，腿骨已完全消失；19 号腿部受伤；20 号左翅残骸；21 号右翅与右腿骨折断；22 号个体腿骨折断；23 号于夜栖地发现的完整尸体；24 号-26 号腿骨受到不同程度的折损，27 号在河内打捞的尸体，左翅有显著受伤痕迹;28 号个体左腿足部全部断离;29 号个体颈部折断死亡，30 号个体在夜栖地受伤站立困难。李欣桐 摄

Figure 4. 10 – A rescured from water, with injured left wing and a broken foot; 11-- The right wing remains under the power lines; 12 – A bird with broken left wing and both legs broken; 13 – Bird had only the right wing remains under the power lines; 14—Bird had a pair of wings remains under the power lines; 15 – Bird had broken right wing and a broken leg; 16 –Bird had broken right wing; 17 –Bird had broken left wing and broken right leg bone; 18 -- Bird died in the water at the foraging site, and the legs completely disappeared; 19 -- Bird had an injured leg; 20 – Bird had the left wing remains; 21-- Bird had broken right wing and right leg; 22 –Bird had a broken leg; 23 – A bird body found at the roost; 24-26 -- Birds with different degrees of broken legs; 27 – Bird rescued from the river, with obvious signs of injury on the left wing; 28 – bird had its left leg and foot completely severed; 29 -- bird had a broken neck and died; 30 -- Bird had difficulty standing due to injuries. Photos by Li Xintong.

图 5. 8 号个体与捕食者赤狐(*Vulpes vulpes*)同框(李欣桐 摄)
Figure 5. A Red Fox seen near crane body No.8 (Photo by Li Xintong)

图 6. 10 号个体与捕食者家犬同框（李欣桐 摄）
Figure 6. A domestic dog seen by crane body No.10 (Photo by Li Xintong)

Collisions of Black-necked Cranes with powerlines in Tibet during the winter of 2024-2025

Li Xintong & Guo Yumin
College of Ecology and Nature Conservation/National Park College, Beijing Forestry University, Beijing 100091

In recent years, to meet the growing demand for electricity, China has built the world's longest power lines and the most complex power grid system. The expansion of power transmission and distribution lines, however, has also brought some ecological and environmental problems, among which the impact on bird survival is particularly prominent. Powerlines not only make bird habitats fragmented, but also may cause birds to collide with or be electrocuted. Therefore, documenting the powerline collision by birds, assessing its impact on the birds' survival, and exploring possible mitigation measures is very important for maintaining a healthy ecosystem and for sustainable development.

The Black-necked Crane (*Grus nigricollis*) is mainly distributed and is a first-class protected wild animal in China. The global population of Black-necked Crane is about 18,000. Due to the stable growth of the Black-necked Crane population, the International Union for Conservation of Nature (IUCN) Red List downlisted the

threat level of the Black-necked Crane from Vulnerable (VU) to Near Threatened (NT) in 2020. Despite this, the death caused by powerline collision is still a major problem affecting the population of the Black-necked Cranes. To better understand the situation, we conducted surveys in 2024/25 winter on the collision in the main wintering areas of the Black-necked Crane, such as Mozhugongka County and Linzhou County in Tibet.

From December 25, 2024 to January 7, 2025, field surveys were conducted in the vicinity of Tangjia Township, Mezhugongka County, and Kazi Township and Qiangga Township to the west of Linzhou County, both counties under jurisdiction of Lhasa City (Figures 1 and 2). During this period, a total of 30 individuals were found to have been injured or killed by power lines (Figures 3 and 4). Except for individual No. 1, which was promptly sent to the County Forestry and Grassland Bureau for treatment after being discovered, the other injured individuals could not be rescued in time.

Powerline collisions in Mozhugongka mostly occurred in farmland and shallow rivers where power lines are distributed, with high casualties mainly near the foraging areas, or on the routes that Black-necked Cranes must fly between their roosting and foraging areas. Since Black-necked Cranes have limited vision when flying at dusk or in bad weather, the risk of colliding with power lines is greatly increased under these conditions. At the same time, there are many predators in the area (such as foxes *Vulpes* spp., domestic dogs, etc.), and injured individuals or carcasses of Black-necked Cranes are often quickly disassembled and removed (Figures 5, 6), making on-site investigations very difficult.

In Linzhou County, the high-incidence area of powerline collision was found in an area where there were two parallel transmission lines of 220KV and 400KV less than 1 km east of the crane roosting area. Eight dead cranes were found under the lines alone, as well as some dead Bar-headed Geese (*Anser indicus*) and Ruddy Shelducks (*Tadorna ferruginea*). A foraging ground for a flock of Black-necked Cranes is about 400 m east of these parallel transmission lines. These Black-necked Cranes fly out from the roosting area in the Pengqu River Basin to the foraging ground between 9:00-11:00 o'clock and returned to the roosting area in flocks between 19:00-20:00 o'clock. Several sections (between the towers or powerline poles) of these two parallel power lines do not have any warning devices installed, which eventually became the main accident line section that caused crane casualties.

After the spring festival (January 29, 2025), we surveyed 49 more days in Tibet. In the 2024-2025 wintering season, a total of 88 Black-necked Cranes were confirmed to have been killed or injured due to collisions in the main wintering areas of Black-necked Cranes in Tibet, including 2 individuals with satellite trackers. Such a number of casualties have fully demonstrated that the powerline collision is a major factor threatening the Black-necked Crane population in the region, posing a serious challenge to the plateau ecosystem. Although the relevant organizations have installed warning markers on some of the powerlines, these measures still failed to prevent the tragedy from continuing to occur. It is recommended that the relevant agencies act as soon as possible to speed up the installation of warning markers in the survey areas to reduce subsequent casualties. At the same time, it is also recommended not to plan more powerlines in this area to avoid more serious collisions.

****

Safeguarding Cranes Amid the New Energy Boom*

Fizala Tayebulla & Stephanie M. Schmidt
International Crane Foundation

One of 15 crane species, the Endangered Whooping Crane is a migratory bird and, depending on the flyway, can travel up to 2,500 miles between summering and wintering locations in North America. Throughout their entire range, Whooping Cranes rely on wetlands and uplands, such as grasslands and agricultural lands, and are known indicators of ecosystem health. They will use shallow wetlands as a safe habitat to roost overnight and, during the day, will forage in uplands and wetlands within nine miles of their roosting site. However, in parts of the Whooping Cranes' range, these habitats are at risk due to the impacts of growing demands for energy and the infrastructure required to meet those demands.

As the human population grows, the demand for energy, especially from renewable resources such as wind and solar, has drastically increased. This has accelerated the construction of wind turbines, solar farms,

* https://savingcranes.org/news/resources/safeguarding-cranes-amid-energy-boom/

and power lines in the United States. When new energy infrastructure is placed in or near crane habitats, it can disrupt their movement patterns and reduce available resources.

Research indicates that Whooping Cranes will avoid areas within three miles of wind turbines, resulting in displacement from otherwise suitable habitat. While the impact of wind turbines is well-documented, the effects of rapidly expanding solar energy developments on the Whooping Crane habitat are largely unknown but anticipated to exacerbate habitat loss further.

In addition to habitat loss and fragmentation, Whooping Cranes are particularly vulnerable to collisions with power lines. Over 65 Whooping Cranes in North America have died following a collision with a power line since 1975.

As a leader in crane conservation, the International Crane Foundation is dedicated to supporting sustainable energy development that considers the needs of these iconic birds. By understanding the intersection of crane ecology and renewable energy expansion, we can work towards solutions that benefit wildlife and our clean energy goals.

The threats posed by new energy infrastructure are likely to increase as large portions of the Whooping Crane's range have a high potential to generate energy from wind and solar resources, as evidenced by the maps below.

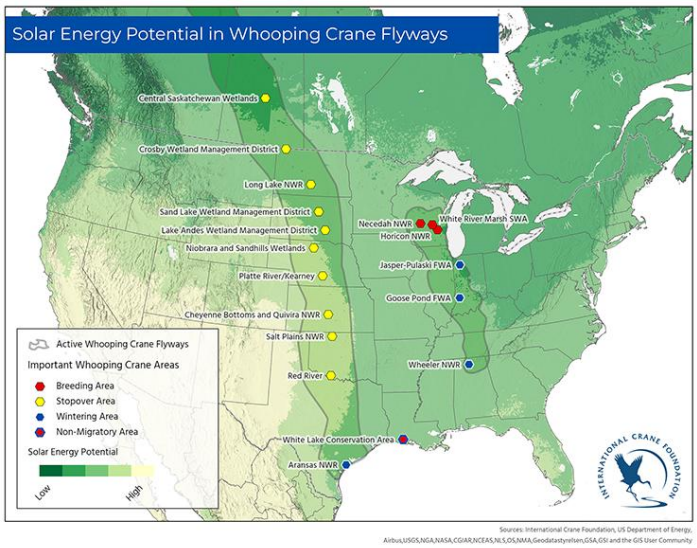


Figure 1. Solar energy potential in Whooping Crane Flyways
图 1. 美洲鹤迁徙路线上的太阳能开发的潜力区域

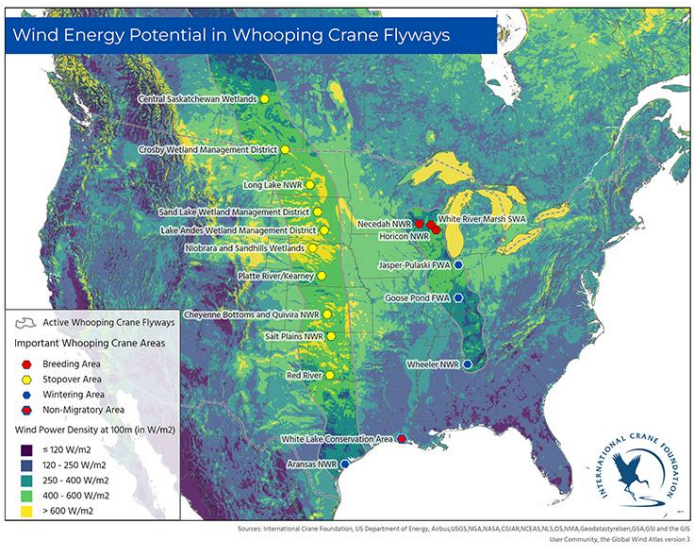


Figure 2. Wind Energy Potential in Whooping Crane Flyways
图 2. 美洲鹤迁徙路线上的风能开发的潜力区域

Existing Infrastructure and Land Availability Further Impact Risk

Solar and wind energy potential is not the only variable considered when determining where to build energy infrastructure. Other factors such as existing or potential infrastructure, land cost and availability, and the energy needs of local populations are also important. Energy infrastructure development occurs in areas where all or most of these conditions are met. In some instances, these additional factors can result in energy

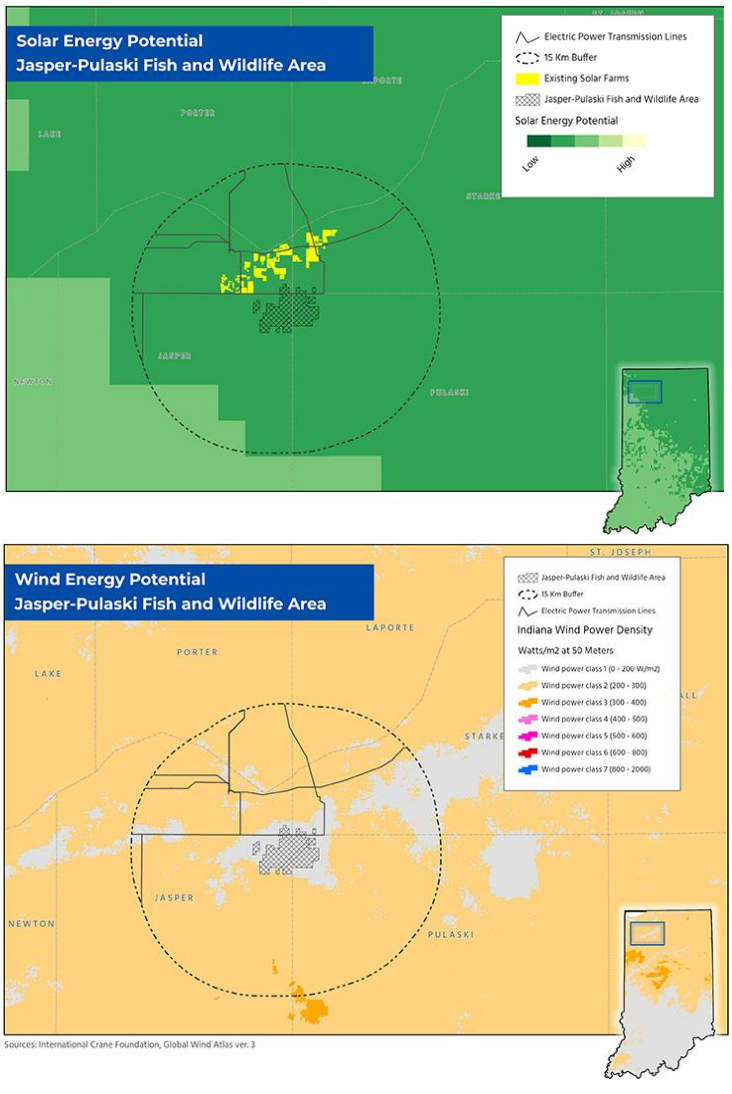
development occurring in regions that do not have the highest energy potential. For example, Indiana has mostly low to average energy potential for solar and wind, but there has been a great increase in industrial solar and wind farms because of existing energy infrastructure and large sections of flat landscapes that are available at competitive prices. The state also has an extensive network of high-energy transmission lines connecting these renewable energy sources to the grid. This rapid increase in development is concerning, as some of this energy infrastructure is being built near refuges that the eastern population of Whooping Cranes and Sandhill Cranes rely on.

While energy developments pose significant risks to Whooping Cranes throughout their range, Indiana emerges as a critical area of concern.

Jasper-Pulaski Fish and Wildlife Area: A Case Study

Jasper-Pulaski Fish and Wildlife Area in northwestern Indiana is a prime example of how an important crane habitat can be affected by, and remain at risk from, energy development. This crucial stopover site, which hosts over 30,000 migrating Sandhill Cranes and several Whooping Cranes annually, is increasingly surrounded by energy infrastructure, such as solar developments and powerlines, to transmit the generated energy. This area also has characteristics that make it attractive for further energy development, such as:

1. Existing wind and solar infrastructure that can be more easily expanded upon.
2. Proximity to existing transmission lines, which reduces the cost of connecting new energy projects to the grid.
3. Availability of relatively flat land that is suitable for energy development.



Figures 3-4. Solar and wind energy potential and existing energy infrastructure within core crane use areas at Jasper-Pulaski Fish and Wildlife Area.
图 3-4. 贾斯珀-普拉斯基鱼类和野生动物保护区内的核心鹤类使用区域内的太阳能和风能潜力以及现有能源基础设施。

Further, large waterbirds, such as geese and swans, also use the Jasper-Pulaski Fish and Wildlife Area and face the same risks posed to Whooping Cranes by new energy developments. Powerlines pose a collision risk

to other waterbird species, and solar fields may be particularly risky as the panels reflect polarized light, which birds can interpret as water. This could result in them attempting to dive or land on the panels and harming themselves in the process. If the potential negative impacts of solar and wind energy structures are not properly or carefully considered, these new energy developments could significantly disrupt migration patterns, reduce available stopover habitat, and increase mortality risks for Whooping Cranes and other migratory birds.

在新能源产业快速发展中做好鹤类保护*

Fizala Tayebulla　Stephanie M. Schmidt
国际鹤类基金会，美国

美洲鹤是 15 种鹤类之一，是一种濒危的候鸟，其在北美的度夏地和越冬地之间的迁徙可达 2500 英里（约 4000 km）的距离。在整个的分布区，美洲鹤依赖湿地以及草原和农田等生存，是这些生态系统健康状况的指标。美洲鹤会把浅水湿地作为安全的夜宿地，白天则会在距离夜宿地九英里（约 14 km）的农地、草原和湿地觅食。然而，在美洲鹤分布的部分地区，由于日益增长的能源需求以及相关的基础设施建设，美洲鹤的栖息地正面临风险。

随着人口的增长，对能源的需求急剧增加，尤其是来自风能和太阳能等可再生资源的需求，这加速了美国风力涡轮机、太阳能发电场和输电线的建设。当新的能源基础设施被放置在鹤类栖息地内或附近时，可能会扰乱鹤类的活动模式，并减少鹤类可利用的资源。

研究表明，美洲鹤会避开风力涡轮机三英里范围内的区域，导致它们被迫离开原本适宜的栖息地。虽然风力涡轮机的影响已得到充分证实，但快速扩张的太阳能开发对美洲鹤栖息地的影响在很大程度上尚不清楚，但预计会进一步加剧栖息地的丧失。

除了栖息地丧失和破碎化之外，美洲鹤还特别容易与电线相撞。自 1975 年以来，北美已有超过 65 只美洲鹤因与电线相撞而死亡。

作为鹤类保护领域的领导者，国际鹤类基金会支持兼顾珍稀美洲鹤生存需求的可持续能源开发。通过了解鹤类生态与可再生能源发展的交汇区域，我们可以努力寻找有利于野生动物和清洁能源目标的解决方案。

如下图所示，由于美洲鹤的大部分栖息地都具有利用风能和太阳能发电的巨大潜力，新能源基础设施带来的威胁可能会加剧。

现有基础设施和土地可用性进一步加重了风险

在确定能源基础设施建设地点时，太阳能和风能潜力并非唯一考虑因素。其他因素，例如现有或潜在的基础设施、土地成本和可用性以及当地居民的能源需求等，也同样重要。能源基础设施通常是建设在满足所有或大部分这些条件的地区。在某些情况下，这些因素可能导致能源开发发生在能源潜力并非最高的地区。例如，印第安纳州的太阳能和风能潜力大多处于中等偏下水平，但由于现有的能源基础设施和大片平坦地势且价格具有竞争力，工业太阳能和风电场的数量大幅增加。该州还拥有广泛的高能输电线路网络，将这些可再生能源连接到现有电网。这种快速发展的势头令人担忧，因为其中一些能源基础设施正建在美洲鹤和沙丘鹤东部种群赖以生存的栖息地附近。

虽然能源开发对美洲鹤在其整个分布范围内构成了重大风险，但印第安纳州已成为值得关注的关键区域。

贾斯珀-普拉斯基鱼类和野生动物保护区：案例研究

印第安纳州西北部的贾斯珀-普拉斯基鱼类及野生动物保护区是一个典型案例，展现了重要的鹤类栖息地如何受到能源开发的影响，以及持续面临来自能源开发的风险。这个重要的中途停留地每年有超过 3 万只迁徙的沙丘鹤和数只美洲鹤，如今，该地区正日益被能源基础设施（例如太阳能开发项目和输电线）所包围，用于传输所产生的电能。该地区还具备一些吸引进一步能源开发的特征，例如：

(1) 现有的风能和太阳能基础设施更容易扩展。

* https://savingcranes.org/news/resources/safeguarding-cranes-amid-energy-boom/

(2) 靠近现有输电线路，从而降低将新能源项目接入电网的成本。

(3) 拥有相对平坦的土地，适合能源开发。

此外，大型水鸟，例如雁类和天鹅，也会使用贾斯珀-普拉斯基鱼类及野生动物保护区，它们面临着与美洲鹤同样的新能源开发风险。输电线会对其他水鸟造成碰撞风险，而太阳能场的风险尤其大，因为太阳能电池板反射的偏振光会被鸟类误认为是水面。这可能会导致它们试图俯冲或降落在太阳能电池板上，并在此过程中伤害自己。如果没有适当或仔细地考虑太阳能和风能设施的潜在负面影响，这些新能源开发可能会严重扰乱鸟类迁徙模式，减少可用的中途栖息地，并增加美洲鹤和其他候鸟的死亡风险。

【其他水鸟消息】
[News on Other Waterbirds]

三江国家级自然保护区繁殖的东方白鹳

赵琬婧
黑龙江三江国家级自然保护区管理局，黑龙江抚远 156500

东方白鹳是大型涉禽，被列入《濒危野生动植物种国际贸易公约》的附录I，在鸟类红皮书中被列为濒危鸟类，中国政府也将其列为国家一级重点保护野生动物。它栖息于河流与湖边湿地中，在树上营巢，主要分布于东亚的部分国家。

黑龙江三江国家级自然保护区位于黑龙江和乌苏里江交汇的三角地带，总面积 198,089 公顷，是东方白鹳重要的繁殖栖息地。为实现其种群恢复，三江自然保护区陆续搭建人工鸟巢 200 多处，成功地对东方白鹳进行了人工招引，使其种群数量显著增长。

2024 年秋季，在三江自然保护区永发和四合区域多次观测到东方白鹳迁徙集群，其中，9 月 12 日四合观测到 200 左右的集群（134.436755 E；47.443597 N），10 月 24 日在永发观测到 600 只左右的集群（134.667424154 E；47.672927187 N），10 月 26 日在四合观测到 2024 年最大集群近千只（摄影爱好者拍摄），它们时而嬉戏玩耍，时而高空盘旋，尽显自由欢快，给秋日的三江自然保护区增添了一抹生动的色彩。当年夏季，在三江自然保护区营巢繁殖的东方白鹳已多达 150 多处，自 2013 年搭建人工鸟巢以来，繁殖种群数量实现了十倍增长，累计繁殖 650 多巢，幼鸟 2600 余只，为东方白鹳全球种群恢复贡献了卓越的三江力量。

近些年，三江自然保护区十分重视湿地动物及其栖息地的保护工作，努力为野生动物打造一个安全舒适的绿色家园。良好的生态环境和富集的食物链也吸引了众多野生动物在此栖息和繁衍。如今，随处可见珍稀鸟类东方白鹳在保护区上空展翅飞翔，大白鹭、苍鹭、鸬鹚、鸳鸯等候鸟展现了百鸟竞飞的壮观景象，白尾海雕、雕鸮等猛禽与东方白鹳繁殖期“争巢抢房”的新奇事件时有发生。充分发挥了国家重点生态功能区和国际重要湿地的作用。

Oriental Storks Breeding at Sanjiang National Nature Reserve

Zhao Wanjing
Heilongjiang Sanjiang National Nature Reserve, Fuyuan, Heilongjiang 156500

Oriental Stork is a large wading bird species. It is listed in Appendix I by the CITES and endangered by IUCN Red List of Birds. The Chinese government also lists it as a national first-class protected wild animal. It lives in wetlands near rivers and lakes and nests in trees. It is mainly distributed in East Asia.

Sanjiang National Nature Reserve is in the delta area where Heilongjiang River and Wusuli River meet, with a total area of 198,089 ha. It is an important breeding place for the storks. To recover its population, the reserve has successively built more than 200 artificial nests and attracted Oriental Storks to nest, making a significant increase of its population.

In the fall of 2024, large flocks of Oriental Storks were observed several times in Yongfa and Sihe at Sanjiang National Nature Reserve. On September 12, a flock of about 200 was observed in Sihe (134.43E, 47.44N), and on October 24, a flock of about 600 individuals was observed in Yongfa (134.66E, 47.67N). On October 26, the largest flock of about 1,000 individuals in 2024 was observed in Sihe. These birds circled in the sky. In summer 2024, there were more than 150 nests of Oriental Storks in Sanjiang Nature Reserve. Since the start of the artificial nest construction program in 2013, the breeding population of the storks has increased tenfold. Now, the reserve has produced a total of over 650 nests and over 2,600 young birds from these nests, making an outstanding contribution to the recovery of the global population of Oriental Storks.

In recent years, Sanjiang Nature Reserve has enhanced the protection of wetland wildlife and their habitats. With improved habitats and food sources, many wildlife populations have recovered well in the reserve. Some other species, such as Great Egret, Grey Heron, Great Cormorant, and Mandarin Duck are seen commonly in the reserve. Raptors such as White-tailed Sea-eagle and Eurasian Eagle Owl are often seen competing with Oriental Storks for nests during the breeding season.

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）只接收电子版稿件，上传至电子邮箱 cranenews@163.com，注明联系电话、电子邮箱和“中国鹤类通讯稿件”字样；（2）字数以 500 ~ 1000 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；凡涉及对作者原意的修改，则提请作者考虑；（4）文末写明作者姓名、工作单位；（5）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.