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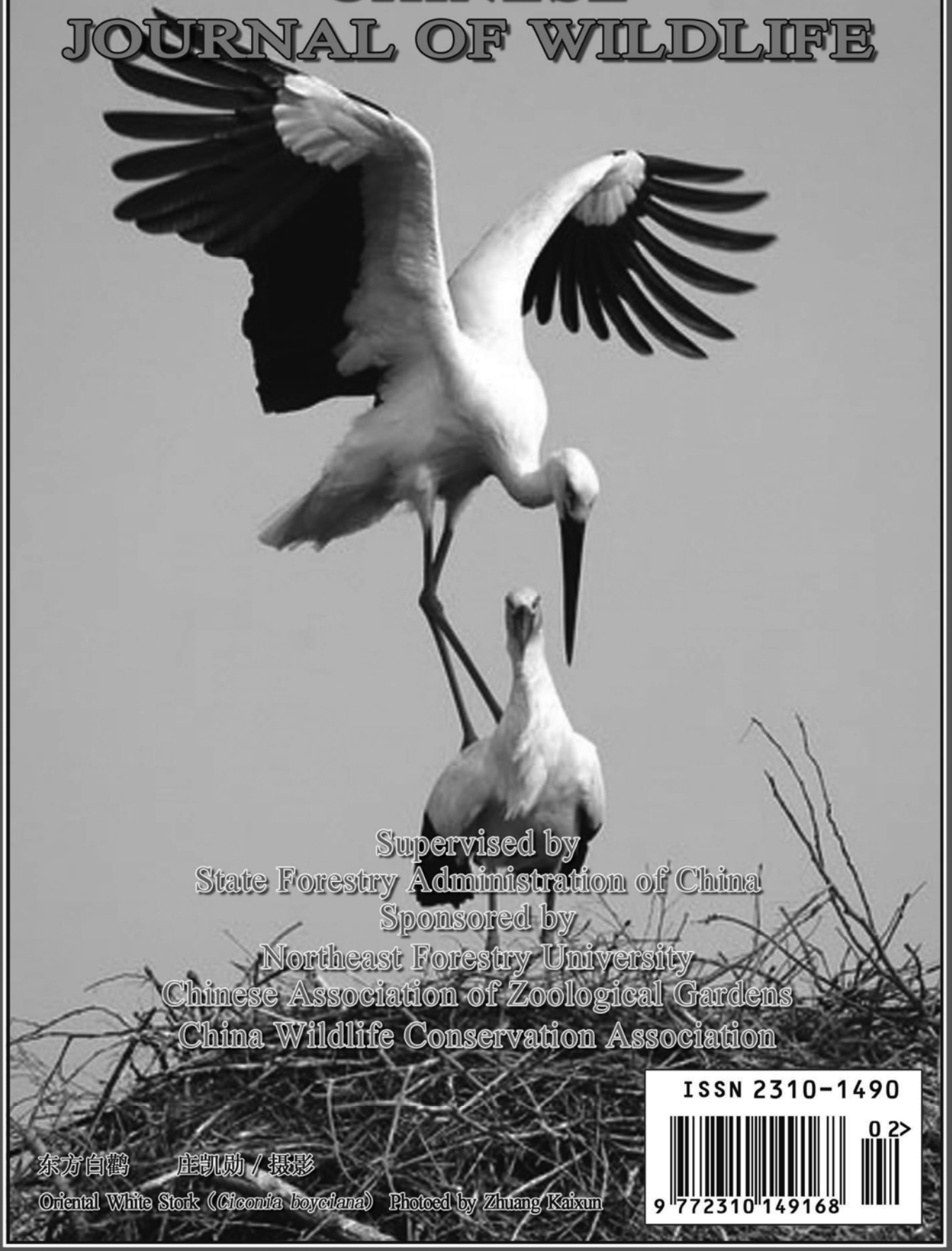

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Oriental White Stork (*Ciconia boyciana*)　Photoed by Zhuang Kaixun

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鄂尔多斯蓑羽鹤迁徙线路初探

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内蒙古自治区鄂尔多斯、乌梁素海和宁夏自治区是蓑羽鹤（*Anthropoides virgo*）在中国的主要繁殖地之一[1－2]，在 Paul Johnsgard 所著之《世界鹤类》（1983）一书中，认为在鄂尔多斯地区繁殖的蓑羽鹤群体独立越冬于缅甸中东北部、中国云南西部澜沧江以西的临沧地区[3]。

由于鄂尔多斯高原上的遗鸥（*Larus relictus*）重要繁殖地桃力庙－阿拉善湾海子（简称桃－阿海子，为全球 No. 1148 国际重要湿地）自 21 世纪初以来逐渐干涸，碱蓬（*Suaeda glauca*）群落大面积发育，使得该地近年来成为蓑羽鹤的繁殖地和夏候鸟群的栖居地[4－5]。2015 年 7 月间，我们在桃－阿海子（E 109°19′，N 39°48′）及周边地带先后捕捉到 5 只成体蓑羽鹤，对其进行环志并佩戴中国湖南研制的 HQBP3622 型 GPS－GSM 跟踪器后安全放飞。

在佩戴 GPS－GSM 跟踪器的 5 只成体蓑羽鹤中，1 只个体（编号为 DC01）据判于 9 月 18 日死亡，其尸体随后在鄂尔多斯西部鄂托克旗的木凯淖尔镇小湖村（E 108°42′，N 39°10′）附近沙地中被找到，该地点为桃－阿海子以西偏南方向约 120 km。尸检结果表明该个体曾遭受猛禽攻击。

其余 4 只个体（编号分别为 DC02，DC03，DC04 和 DC05）于 2015 年 9 月 22 日至 10 月 5 日间先后西迁，飞出鄂尔多斯后均首取宁夏中卫市城西的黄河河道（E 104°55′，N 37°23′）夜栖一晚，随后越甘肃入青海，在乌兰县境内茶卡盐湖（E 99°01′，N 36°44′）夜栖 1～2 晚，然后直飞西藏安多县。编号 DC05 的蓑羽鹤个体在西藏安多西北约 70 km 处信号消失，此后再无信息传回。

不断发送讯号的那 3 只蓑羽鹤分别于 10 月 4 日（DC02）、9 日（DC03）和 9 月 30 日（DC04）飞抵西藏喜马拉雅山北麓的仲巴县（E 84°03′，N 29°36′），夜栖于海拔 4 500～5 100 m 处，并分别于次日飞越喜马拉雅直抵印度恒河（Ganges River）上游，夜栖于海拔约 100 m 的恒河河道附近（E 78°48′，N 26°49′）。10 月 3～14 日，此 3 只蓑羽鹤先后抵达印度西部拉贾斯坦邦（Rajasthan）（E 73°18′，N 25°54′）。至此，历时 10～13 d，完成其行程约 4 650 km 的秋季迁徙历程。

上述 3 只蓑羽鹤个体春季迁飞的启动时间以其编号顺序依次为 2016 年 3 月 17 日，4 月 5 日和 3 月 25 日。它们并未沿秋季迁徙路线返回，而是首先向西北方向取巴基斯坦，跨印度河（Indus River）河谷后入阿富汗，飞越兴都库什山脉（Hindu Kush），在乌兹别克斯坦的艾达尔［库尔］湖（Aydar Kol Lake）附近（E 67°01′，N 41°02′）作 9 d、13 d 和 3 d 的停歇。此后，DC02 和 DC03 个体进入哈萨克斯坦南部，沿哈萨克斯坦和吉尔吉斯斯坦边界地区的天山山脉北麓向东迁飞，分别于 4 月 10 和 23 日溯伊犁河河谷而由哈萨克

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斯坦进入中国新疆，继而沿天山北麓一路东飞，入内蒙古境内后穿越巴丹吉林沙漠和乌兰布和沙漠，于4月21日和30日相继返回鄂尔多斯的桃－阿海子。个体DC04则滞留在哈萨克斯坦中南部，游荡至5月15日，后朝东北方向迁飞，于5月19日取道中国新疆哈纳斯保护区进入蒙古国，最后于5月20日抵达蒙古国巴彦洪戈尔(Bayankhongor)省开始其夏季居留。此3只个体之春季迁徙分别历经36、26和57 d，行程约6 590～6 670 km。

繁殖于东亚和中亚地区的大部分蓑羽鹤个体越冬于印度西部的古吉拉特邦(Gujarat)和拉贾斯坦邦等地已多有报道[6-7]。查阅《云南鸟类志》[8]，及至20世纪90年代中期相关文献，云南并无蓑羽鹤分布记录，直至21世纪初，始有报道称蓑羽鹤见于云南东北部[9]，但作者却未能查找到Johnsgard《世界鹤类》一书中提出鄂尔多斯及周边地带的蓑羽鹤群体独立越冬于滇缅交界地带这一说法的依据及出处。

根据所跟踪的鄂尔多斯蓑羽鹤群体中3只个体(编号分别为DC02，DC03和DC04)发送回的数据，表明其迁徙路线并不涉及滇缅地区，且其秋－春的迁徙线路全然不同，构成了一个近乎环状的迁飞模式(图1)。而这确为以往所不知。无论如何，对鄂尔多斯蓑羽鹤进行卫星跟踪的研究刚刚开始，今后有望提供更多数据信息。而东北亚地区之蓑羽鹤其他群体的迁徙是否也会循环形路线进行，有待进一步揭示。

致谢：本研究得到国家林业局野生动植物保护和自然保护区管理司以及内蒙古鄂尔多斯遗鸥国家级自然保护区大力支持，在此一并致谢!

Preliminary Results of Satellite Tracking on Ordos Demoiselle Cranes

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For quite a time, it is well known that some demoiselle cranes, *Anthropoides virgo*, found nesting on the Ordos upland and its northern skirt of W Inner Mongolia and western skirt of Ningxia[1-2], while, in Paul Johnsgard's work, Cranes of the World, this regional flock or subpopulation of the crane is described wintering, separately and independently, in an area on both sides of the Salween River in central NE Myanmar and extending into far W Yunnan of SW China[3].

Since the beginning of this century, the T－A Nur, No. 1148 Ramsar Site as it used to be the most significant breeding site of the relict gull(*Larus relictus*), almost entirely dried out, and, with *Suaeda* community developed, more Demoiselle cranes appeared in the locality and some of them nested there[4-5]. In July 2015, five adult cranes were captured, being banded and fixed with GPS－GSM transmitter(Type HQBP3622, developed in Hunan of S China), then released.

Amongst those GPS－GSM equiped cranes, one individual(No. DC01) died on September 18 and the body was later on found in a place in central west Orods, some 120 km southwestwards the T－A Nur, and, it seemed that that bird once was attacked by the birds of prey.

All the other four cranes(No. DC02, DC03, DC04, and DC05) started leaving the Ordos upland during a period from September 22 to October 5, and they all choosing Zhongwei of S Ningxia as their first stop for night spending, flying over Gansu on the next day to get into Qinghai, the NE part of the Tibetan Plateau, and spending one night or two nights at Chaka lake shore in Wulan, then, flying directly to Anduo of central N Tibet, where the No. DC05 individual lost, no longer of any signals transmitted, or, received.

The(left) three cranes(No. DC02, DC03, DC04), on October 4, 9 and September 30 respectively, got arrived at Zhongba, a locality right by the hill foot of the north slope of Himalaya, roosting at 4 500－5 100 m, and flying over Himalaya on the next day getting to the upper branch of Ganges river in India, then, on October 8－13, getting arrived at their wintering place in Gujarat of W India. So, roughly, it took some 10－13 days, different in individuals, for those cranes migrating some 4 650 km from their breeding and summering habitat to their wintering ground.

The above mentioned three GPS－GSM equiped cranes(No. DC02, DC03, DC04) started their spring migration on March 17, April 5, and March 25, respectively, choosing an absolutely different route than the way they taking in autumn. First, they flew northwestwards into Pakistan, over the Indus river to get into Afghanistan, acrossing the Hindu Kush Mountains and roosting in the surroundings of the Aydar Kol Lake in Uzbekistan for 9, 13, and 3 days respectively. Then, two cranes(No. DC02, DC03) got into southern Kazakhstan, flying eastwards along the north slope of Tianshan Mountains, the border of Kazakhstan and Kyrgyzstan, and,

on April 10 and 23 respectively，they flying along the Ili valley to get into Xinjiang of NW China and further eastwards into W Inner Mongolia，over two deserts，Badain Jaran and Ulan Buh，finally got back to T－A Nur in Ordos. Whilst，the third crane(No. DC04) stayed in central S Kazakhstan till May 15，took off again towards northeast direction，over the Hanas NR in N Xijiang on May 19，and at last chose Bayankhongor in Mongolia(PRM) for summer spending. It took 36，26，and 57 days for these three cranes to end their spring migration respectively，with 6 590－6 670 km long，

When checking The Avifauna of Yunnan China(Vol. I，Non－Passeriformes)，it sounds that，until mid－1990s，there had been no record of the demoiselle crane reported in Yunnan[6]. While，in the beginning of this century，records of the Demoiselle Crane appeared in far NE Yunnan[7].

Data presented by those three individuals from the demoiselle crane Ordos flock have shown that they choosing quite different route for their migration in spring than in autumn，and the two routes made it somewhat a cycle，and therefore we wonder if other demoiselle cranes，both breeders and non－breeders，inhabiting in Far East Asia would prefer choosing the same route or not. Anyway，this is the beginning of our work，more will be revealed along with the time going.

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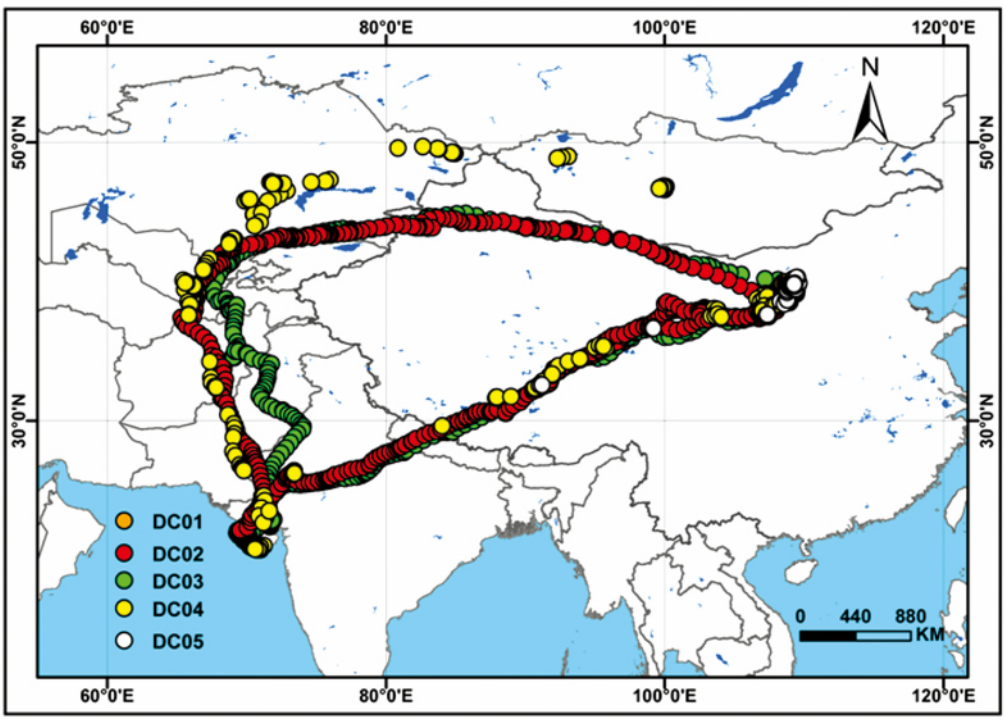

图1 蓑羽鹤环形迁徙路线示意图

Fig. 1 Sketch map showing the route the Ordos demoiselle crane choosing for migration