

Cranes and Their Conservation in Huanghe Delta National Nature Reserve, Shandong Province

By

Zhu Shuyu, Lu Juanzhang, Zhang Anfeng,
Shan Kai, and Wang Lidong

*Administrative Bureau of Shandong
Huanghe Delta National Nature Reserve
Dongying, Shandong Province
China 257091*

Huanghe Delta National Nature Reserve (hereafter referred to as the Nature Reserve) is located at the Huanghe River Delta estuary by Dongying City, Shandong Province. To the north is the Bo Sea, and to the east is Laizhou Bay. The area covers 153,000 ha and is situated at 37° 35' to 38° 12' N, 118° 33' to 119° 20' E, between inland northeast Asia and the Jianghuai Plain. The Nature Reserve is the newest, best protected, and most extensive wetland reserve. It includes the Huanghe River estuary, a relatively recent wetland ecosystem that is used by rare and endangered birds. The Nature Reserve is one of the most important stopover and wintering and breeding areas for birds migrating through the inland north-east Asia-West Pacific Ocean Flyway.

Methods

Since 1990, line-transects, roadside surveys, and sample counts have been conducted to determine crane species, their numbers and distribution, and wintering behavior.

Crane Species

Five crane species are found in the Nature Reserve: Common Crane (*Grus grus*), Red-crowned Crane (*G. japonensis*), Hooded Crane (*G. monachus*), White-naped Crane (*G. vipio*), and Demoiselle Crane (*Anthropoides virgo*). Their migratory and ecological habits are described below.

Common Crane

The Common Crane is an important species wintering in the Nature Reserve. It has the largest population and most widespread distribution among the five species. Common cranes arrive annually at the Nature Reserve after mid-October. Peak numbers are approximately 6,000 birds, with the largest flock observed being more than 300 birds. Upon arrival, Common Cranes are found primarily in loose flocks numbering 100–200. Later these flocks separate into family units containing three to four cranes. Some Common Cranes stage at the Nature Reserve in fall then continue south for the winter, returning to the Nature Reserve in late March. The annual wintering population at the Nature Reserve has remained stable at approximately 1,000 birds. Therefore, this area is an important wintering ground for the Common Crane and is also the northernmost boundary of its winter range.

Sometimes Common Cranes are seen in soybean and wheat fields feeding in mixed flocks with geese and other crane species. Common Cranes are found primarily along the old channels of the Huanghe River, in the estuary, at Dawenliu Wetland, and in farmlands. They feed on tender aquatic grasses, soybeans, winter wheat, mollusks, and crustaceans.

Red-crowned Crane

The Red-crowned Crane is a common species in the Nature Reserve. Most Red-crowned Cranes are

migrants, stopping over for a short time in fall to replenish their energy reserves before continuing south. Only a small population winters here. Migrants pass through the Nature Reserve in mid-October and again from February to early March. During fall migration an estimated 1,000 Red-crowned Cranes can be seen in the Nature Reserve. Approximately 800–900 birds leave after a short stopover, and 100–200 birds remain and overwinter.

Red-crowned Cranes concentrate in estuarine lowlands, the estuary, Dawenliu Wetland, and in wheat and soybean fields. Usually flocks number four to eight birds. Occasionally we have observed up to 20 Red-crowned Cranes in mixed flocks with Common Cranes. Red-crowned Cranes feed on tender aquatic grasses, soybeans, winter wheat seedlings, mollusks, small fish, and shrimp. The species prefers remote areas seldom disturbed by human activity. Promoting conservation of these habitats is of great importance for the protection of the Red-crowned Crane.

Hooded Crane

The population of Hooded Cranes in the Nature Reserve is relatively small. Birds begin arriving in mid-October, stopping for a brief time before continuing south. Fall migration is complete by early November. Hooded Cranes stop over during spring migration, from late March to early April. Annually, about 100 Hooded Cranes migrate through the Nature Reserve, with the largest flocks numbering around 20 birds. They are often seen in mixed flocks with Common Cranes. Primary areas used by the Hooded Crane include the Yiqian'er Administrative Station, Dawenliu Wetland, and the Huanghe River Delta estuary. They feed primarily on winter wheat seedlings, soybeans, and small vertebrates.

White-naped Crane

White-naped Cranes migrate through the Nature Reserve, stopping over briefly during early November and again from late March to early April. About 150 White-naped Cranes can be seen during migration. They are scattered in small flocks in the river estuary, streams, and ponds beside Yiqian'er Administrative Station, and occasionally in wheat fields.

Demoiselle Crane

The Demoiselle Crane is a rare visitor to the Nature Reserve. Three were recorded in 1986, with none observed since then. Further research is needed on this species.

Siberian Crane

Based on results of satellite-telemetry studies conducted by the National Bird Banding Center, the Siberian Crane stops briefly at the Nature Reserve. Due to the short time they stay and their tendency to stop at the river mouth and beach, no other observations have been recorded for this crane. Further research is needed on this species.

Importance of the Nature Reserve

Huanghe Delta National Nature Reserve lies in the middle of the flyway for northeast Asian inland birds that encircles the west Pacific Ocean. The reserve serves as a migratory stopover, wintering, and breeding site. Recent studies have identified nearly 270 avian species breeding, wintering, or stopping over at the Nature Reserve. The 153,000 ha Nature Reserve includes a well-protected wetland that supports abundant food resources and cover. Its good habitat and suitable climate make it an excellent migratory stopover and wintering area. Both national and international scientists have highly acclaimed the Nature Reserve. They noted that this large, well-conserved area provides perfect wintering grounds for cranes.

Principal Threats to Cranes

Oil Exploration and Development

Beneath the Nature Reserve are subsurface natural gas and oil deposits. Gas and oil exploration and development not only destroy large areas of crane habitat (especially wetlands), but also increase the level of human activities. Polluted water and noise negatively impact cranes. Prior to its development in 1992, the Feiyantan Oil Field located in nearby Yiqian'er Administrative Station was the principal nighttime roost site for Common Cranes. Oil

exploration and development in this area have destroyed the ecosystem and increased the level of human activities. As a result, the Common Crane is very rarely seen in this area.

Natural Disasters

Natural disasters impacting cranes refer primarily to storm tides. The elevation of the Nature Reserve is low. Storm tides inundate large areas of uplands, resulting in increased soil salinity and the loss of farmlands. As a result, feeding habitat is reduced and the wintering and migrant cranes cannot obtain enough nutrition. The area around Yiqian'er Administrative Station was once the main wintering site for Common and Red-crowned Cranes. Of the 500–800 Common Cranes wintering in the Nature Reserve, 100–200 regularly use this area. In 1997, a very large storm tide flooded nearly all of this area's farmlands, resulting in a sharp decline in the local population of Common Cranes.

Cessation of Flow in Huanghe River

The Huanghe River flow is the dominant factor forming and maintaining the wetland ecosystem in the Nature Reserve. Since 1995, the river has temporarily ceased to flow, with the duration of flow cessation increasing annually. The Lijin section of the river ceased to flow for 118 days in 1995, 136 days in 1996, and 226 days in 1997. The annual cessation in river flow combined with significant high evaporation (annual evaporation = 1,962 mm; annual mean precipitation = 592 mm) is reducing wetland habitats and causing soybean and winter wheat crop failures. Both habitat and food resources are decreasing. Although this situation has not yet impacted the cranes very much, the reduced river flow is a very serious threat. Countermeasures must be adopted right now to prevent more serious impacts.

Recommendations for Crane Conservation

Cranes are one of nature's most precious assets. However, environmental problems have caused most crane species to be endangered. Based on our research

and analyses, the following recommendations are made:

1. Enhance law enforcement within the reserve. In order to prevent further destruction of crane habitat, strictly prohibit by law activities harmful to the reserve's natural resources.
2. Promote the development of the Nature Reserve and support economic and social benefits to residents.
3. Alleviate poverty for residents around the Nature Reserve by supporting economic efforts that enhance conservation and optimize the natural environment. This is an important new way to build responsible community management and to share economic and social benefits.
4. Promote scientific research and sustainable development. Scientific research provides the basis for Nature Reserve development and conservation of cranes and habitat. On one hand, research should be conducted on crane ecology, environmental changes impacting cranes and their habitat, and habitat restoration to form a scientific basis for effective protection. On the other hand, rational utilization of resources to achieve sustainable development should be pursued to provide economic support for the construction and development of the Nature Reserve.
5. Conserve and restore habitat. Based on scientific research, engineering actions should be taken to conserve and restore crane roosting and feeding habitat. Two issues need to be solved immediately. For areas around Yiqian'er Administrative Station destroyed by storm tides, impounding fresh water to alkalize the soil and restoring the original plant life are necessary to reestablish crane-feeding habitat. At restored feeding areas, further engineering projects are needed to prevent or mitigate the effects of future natural disasters.
6. Enhance public education. Large-scale public education using multiple outlets such as newspapers, radio broadcasting, TV, and movies is an effective way to encourage

people to love and protect birds. Cultivating this attitude will result in their conscious actions to protect cranes and their habitat. Continued public education over the past few

years has had some good outcomes. Since 1990, local residents have saved 17 cranes, including Red-crowned, Common, and Hooded Cranes.