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# **SIBERIAN CRANE**

## **FLYWAY NEWS**



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## CAPTIVE BREEDING

### ACTIVITY OF OKA CRANE BREEDING CENTER IN 2002

*By Tatiana Kashentseva*

On October 31, 2002, 29 Siberian Cranes were kept (15 males and 14 females) at the OCBC. During the last year, nine Siberian Cranes were transferred to the Cracid Breeding and Conservation Center (CBCC).



Constant control of chick's weighting.  
Photo by T. Kashentseva

Implementing the program under the international project "The Siberian Crane," the OCBC staff focused on captive breeding of Siberian Cranes.

During the breeding season of 2002, nine Siberian Crane pairs laid 36 eggs. Four eggs were transported to the Kunovat Nature Refuge in West Siberia for placement in the nests of wild Eurasian Cranes. Two of four eggs were later returned to the OCBC as hatched chicks due to shortage of nests in the wild.

Thirty eggs were fertile. Twenty-five eggs were incubated by either natural or combined natural/artificial methods. Of these 25 eggs, nine were hatched by their parents, 16 by other Siberian Cranes or cranes of other species. All 25 chicks hatched. Of these 25, eight chicks were reared by their parents (five survived), two chicks were reared by humans and 15 (nine survived) were reared in isolation from human specifically for the experimental project "Flight of Hope" at a site called "Lipovaya Gora," 20 km from OCBC. Of 16 survived chicks 10 were released to the wild, six stayed in OCBC.

An eight-year-old female, which had hatched from the egg brought from the International Crane Foundation (ICF) and had been raised at OCBC, nested for the first time in 2002. The female was kept with an adult male during the last three years. During this time, the pair

exhibited nesting behaviour, constructed a nest, and made attempts to incubate a stone. In 2001, the pair incubated a wooden dummy egg for a month. In 2002, the female laid two eggs. Two chicks hatched; one of them was raised by its parents, and the other by people.

Unfortunately, rickets (impaired phosphorus-calcium metabolism) developed as a result of difficulties in acquiring fresh nutritionally-complete food pellets; steps are being taken to avoid these problems from recurring in the future. Rickets was the main chick health problem in 2002. After the problem was identified through biochemical blood tests performed in the Centre Moscow Veterinary Clinic, most of the chicks were successfully treated with vitamins and calcium injections. The treatment was begun just in time to improve the health of the younger chicks and to save most of the sick chicks. Many of the latter, however, developed crooked leg bones and joint deformities.

Nine chicks died due to rickets. Three were raised by parents, and three in isolation. The carcasses of two Siberian Crane chicks were transferred to the collection of the Moscow State University's Zoological Museum.

In 2002, joint studies of the genetic diversity of the captive population of Siberian Cranes between OCBC and the Institute of Gene Biology, Russian Academy of Sciences, were continued. Sixteen blood samples were collected from the chicks born in 2002 and five samples were taken from the organs of the dead chicks. The samples were preserved and transferred to the Institute for sex determination analysis.

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# REINTRODUCTION

## "FLIGHT OF HOPE" PROJECT

*By Alexander Sorokin, Anastassia Shilina, Alexander Ermakov, and Yuri Markin*

The western and central populations of Siberian Cranes are disappearing. During the second part of 20th century the number of birds in these two geographically overlapping populations decreased very sharply, and now there are perhaps only 10 to 20 birds left. Consequently, the Russian Federation has worked closely with colleagues in Central Asia to promote the preservation of these populations of Siberian Crane.

As a result of research and conservation efforts a program for Siberian Crane population recovering was developed by All Russian Research Institute for Nature Protection (ARRINP) of Ministry of Natural Resources (MNR) of the Russian Federation under the framework of international cooperation. One of the main tasks under this program is the introduction of captive-bred Siberian Cranes to the wild. The major challenge for released cranes is the lack of the flight and migration route experience, which parents teach their young in the wild.

The "Flight of Hope" Project applies innovative techniques to teach young cranes to fly along their migration route to wintering grounds in Iran. The theory is that the isolation-reared Siberian Cranes will be imprinted on hang glider and the pilot can act as a leader and train the young birds to follow the hang glider. Stopovers along the flyway should be defined before migration. This method is expected to increase chick survival rates and increase the effectiveness of Siberian Crane migration efforts.

American specialists, developed techniques to reintroduce Whooping Cranes to the wild by leading young captive-reared birds along their migration route behind an ultralight aircraft. Results show that 100% of cranes that successfully followed the ultralight the entire route from the release site to their wintering grounds then safely returned on their own from the wintering sites back to their release site the following spring.

### **Projects participants**

#### ***Russian Federation:***

- All Russian Research Institute for Nature Protection of Ministry of Natural Resources of the Russian Federation;
- Crane Breeding Center of Oka Biosphere State Nature Reserve (the OCBC)
- "Sterkh" Foundation, Yamalo-Nenetsky Autonomous Region.

#### ***USA:***

- International Crane Foundation (<http://www.savingcranes.org>)

#### ***Italy:***

- Angelo d'Arrigo – hang-glider pilot, repeated champion and world record holder, has extensive experience in flying with raptors ([www.angelo-darrigo.com](http://www.angelo-darrigo.com))

### **Project stages in 2002**

1. Producing Siberian Crane eggs with early hatch dates (in early May) at the OCBC so that birds will mature early enough to have good flight strength by migration time.
2. Rearing of Siberian Crane chicks in isolation from humans and in combination with hang-glider imprinting at the OCBC.
3. Shipping the young cranes to the Siberian Crane breeding sites, their adaptation to local conditions, and advanced training to fly behind the hang glider.
4. Local flights of cranes behind hang glider on the key stopovers during migration from the Lower Ob River to the southern part of West Siberia.
5. Introduction of three Siberian Cranes taught to fly behind hang-glider with wild Eurasian Cranes at their autumn stage area in West Siberia at the Belozersky Wildlife Refuge (Zakaznik).
6. Introduction of Siberian Cranes taught to fly behind hang glider in Iran.

### **1. Producing Siberian Crane eggs with early hatch dates at OCBC**

At OCBC, 10 eggs were produced which hatch dates before 15 May, four of these were infertile. Because three of the six hatched chicks died at an early age, the project team had to use seven younger chicks that hatched after 15 May to have the desired total of 10 chicks for the experiment.

### **2. Rearing of Siberian Crane chicks in isolation from human and in combination with hang-glider imprinting at OCBC**



Training flights of Siberian Crane at "Lipovaya Gora" site in Oka State Nature Reserve. Photo by A. Sorokin

Special pens for rearing the cranes in isolation were built at one of Oka Biosphere Nature Reserve ("Lipovaya Gora" sites), 20 km from the village Brykin Bor, where OCBC is located.

Twice a day OCBC staff dressed in special crane costumes and Angelo d'Arrigo walked with the ten chicks and taught them to follow the hang-glider. In the beginning of August, the two oldest chicks began taking short flights behind the hang-glider, the others run after them.

The six strongest chicks were chosen for the hang glider experiment in West Siberia. A decision was made to release the other four Siberian Cranes in the south of Tyumen Region at the Beloozersky Wildlife Refuge.

### **3. Shipping young cranes to the Siberian Crane breeding grounds, their adaptation to local conditions, and advanced training to fly behind hang glider**



Survey of Siberian Crane breeding place with helicopter. Photo by C. Mirande

Following hang-glider. Photo by C. Mirande

On 14 August 2002, six young cranes were shipped by commercial plane to Salekhard, Yamalo-Nenetsky Autonomous Region, then by helicopter to the Siberian Crane breeding sites (near Kushevat Village, 200 km south of Salekhard). The shipment occurred two

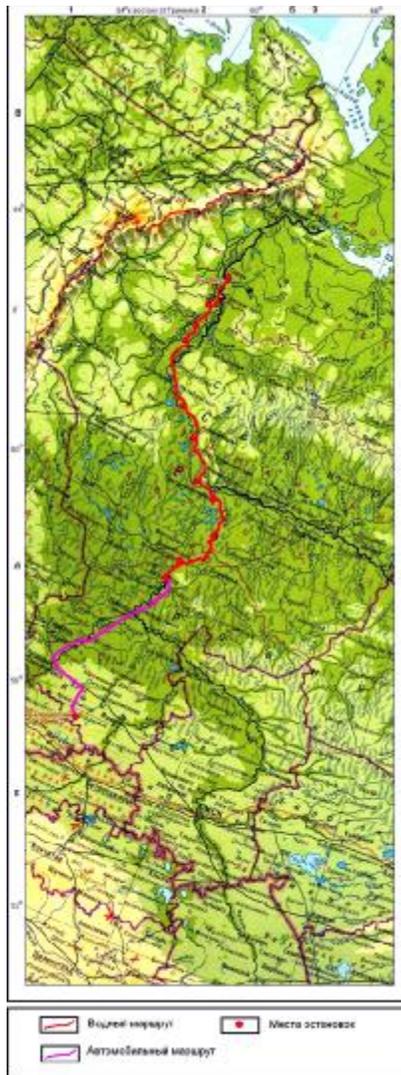
weeks later than originally planned, to allow the youngest chicks time to mature at Oka Reserve.

Special portable temporary pens were built for cranes in Kushevat. Over the next two weeks the cranes adapted to the new conditions and new food, and followed the hang glider on the ground twice each day. Unfortunately the weather (strong wind and rain) impeded daily flights with hang-glider.

### **4. Local flights of cranes behind hang-glider to the key stopovers during migration from the Lower Ob River to the southern part of West Siberia**

It was originally planned that cranes would fly behind the hang-glider from one stopover to the next along the migratory route. These stopovers, mainly hayfields in the flood-lands, were identified in 2001. In 2002, however, the weather was extremely rainy, water levels in Ob River Basin were at a record high, and all designated take-off and landing sites were flooded. Numerous helicopter, boat and ground surveys were conducted to find suitable stopovers. Therefore cranes could take only

### Migration route



local flights behind the hang-glider during stops at the suitable places. Along migratory route from Kushevatskiy (Yamalo-Nenetsky Autonomous Region) to Uvat (Tyumen Region) from August 27 to 8 September, the cranes and the project team traveled by barge or motor-launch. From Uvat to Beloozerskiy Zakaznik (Armizonskiy, Tyumen Region) the cranes were shipped non-stop. On 10 September 2002, after two weeks in transit, the cranes and team completed their migration route.



Developing of migration route. Photo by C. Miranda



Temporary pens. Photo by A. Sorokin

● - stopovers



Walking at stopovers. Photo by A. Sorokin and C. Miranda

## **6. Introduction of Siberian Cranes taught to fly behind hang-glider in Iran**

On 22 September, three of the six cranes that had traveled south from Kushevav were returned to the OCBC were they kept in isolation. The plan was to transport them to Iran in January and released then at the Bujagh National Park on the Caspian Sea coast.

### **Conclusions**

- For the first time the method of teaching cranes to fly behind a hang glider was tested.
- A series of local flights were conducted.
- Suitable stopovers along the Siberian Crane Flyway in West Siberia were identified.
- Siberian Cranes chicks get good flight training and adapted to different weather conditions along the more complicated part of migratory rout.

Seven Siberian Cranes were released to the wild along the Siberian Crane Flyway and tree others were prepared for release in Iran



Released Siberian Cranes. Photo by A. Sorokin

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## **AUTUMN MIGRATION AND WINTERING 2002/2003**

### **CENTRAL POPULATION**

#### **India**

As the number of Siberian Cranes declined in India, their arrival and departure pattern also changed. A review of the past twenty years' records showed the Siberian Cranes reaching Keoladeo National Park (KNR) late and taking off for breeding grounds somewhat early. The traditional arrival until the late seventies was during late October and early November. At times the birds arrive to the park only in December. In 1996, the cranes turned up in the park on 1 January.

The year 2002-2003 has recorded one of the worst drought spells in the history of the park. The entire 29 km<sup>2</sup> area of this renowned wetland habitat is totally dry. Not a drop of fresh water was available this season due to failure of the monsoon rainfall in moisten the water-shed areas.

The Forest Department has installed two tube wells, one in D Block and another in the L Block of the park. They were commissioned during third week of December 2002 and gave the park some water. But this water arrived too late to bring birds to the park. And since it was not fresh water from the river it did not bring in fish fingerlings and numerous other micro-organisms, to recreate life in the park.

Prior to this, three earthen wells had been switched on. Water was observed along the road and an amount that might be sufficient for waders or other shore birds. But there were no ducks. There were no Siberian Cranes. It showed that birds have a better sense of management than the man!

There has been little impact of winter this year in northern India. It is possible that the Siberian Cranes realised this and spent the winter in an area where the temperature was suitable for them. Hence the Siberian Cranes did not appear in the park.

If KNP was facing drought, the cranes could have gone to other habitats. Once the three Siberian Cranes had been reported in Talab-i-Shashi, south of KNP. Then the disappearance of Siberian Crane from the park caused alarm among birdwatchers. The Tourism & Wildlife Society of India announced an award of Rs 1,000 per bird to those who would report them elsewhere. Two employees of the KNP identified the birds at Talab-i-Shashi. They received the award money.

In 2002-2003, we sent bird watchers to Bund Baretha. There was enough water in this lake, about 40 km west of Bharatpur. The water was deep, however, and the aquatic vegetation was not adequate for the Siberian Cranes.

Talab-i-Shahi and Urmila Sagar, about 65 km south of KNP, offer ideal habitat with plenty of food for the Siberian Cranes. However, there has been no report of them having landed at these water bodies until 24 December 2002. Bird watchers have been sent to check these habitats for cranes. Two local sources were engaged to report soon after the Siberian Cranes landed there. There has been no news. The whereabouts of the Siberian Cranes remain a mystery. Where is the central population flock of Siberian Cranes to be found in the end of its migration to India? It is sad news for the KNP. It is sad news for the Siberian Cranes. A few hundred birdwatcher guides and rickshaw pullers at the park are having worst time of their career. No water. No birds. No livelihood.

More dedicated efforts are needed to ensure water supply to this park of great international repute. The one meeting we organised towards end of November in Jaipur with the Secretary of Irrigation was not enough. Facing a dismal present, we hope that the future of this park will be brighter.

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## WESTERN POPULATION

### Kazakhstan



Pair and single Siberian Crane in Naurzum Nature Reserve in autumn 2002. Photo by Ye. Bragin

During the autumn migration through Northern Kazakhstan a **Siberian Crane pair and a single adult** were recorded. At first the pair was met on 9 September near Kemel Lake in Naurzum Nature Reserve. Later it was observed on 15 and 24 September near Large Aksaut Lake. Kemel Lake and Large Aksaut Lake are part of the Naurzum System of Lakes, the distance between them is 12 km. On 18 September the lone Siberian Crane was sighted on Small Aksaut Lake. Presumably this bird was not from the pair noticed on the previous days. The cranes were not banded.

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### Russia

On 29 and 30 October aerial surveys of the Volga Delta were conducted. Reservoirs in the bottom zone of delta where we felt it likely to find cranes, but inaccessible to ground survey, were examined carefully. Although conditions for Siberian Cranes this year were favorable, **they were not found**. I constantly interrogated everyone likely to see cranes, especially where the birds were seen last time (Damchik area), but, unfortunately, without success.

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### Iran



Single wild adult and released young Siberian Cranes together with Eurasian Crane in Fereydoon Kenar in winter 2002/2003. Photo by Yu. Markin

On 30 October 2002 local hunters reported that three Siberian Cranes (pair with a chick) arrived in Ezbaran, Mazandaran, on the night of 29 October. They saw cranes in Fereydoon Kenar damgah the next morning. The last few days were very balmy, almost tropical warm (around 25° C) and breezy. On the night of 1 November it started raining, ending with a fierce thunderstorm. On 1 November, we visited Ezbaran where three Siberian Cranes stayed all night, but they flew off during the day separately, therefore the "smaller one" was not a chick as the local people reported. **These three were the pair and one adult**. On 6-9 November, however, we watched a

**Eurasian Crane** in juvenile plumage stay close to the Siberian Cranes. This Eurasian Crane, which looked much smaller than the Siberian Cranes, was first seen with the pair of Siberian Cranes and therefore was confused as their juvenile. It is possible that this young Eurasian Crane came along with the pair from Siberia.

It is a very unusual sighting. The flyway of the Eurasian Cranes passes in 500-600 km to the west where they fly through Azerbaijan along the other side of the mountains.

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## **EASTERN POPULATION**

### **Mongolia**

On 25 May 2002 I observed one Siberian Crane in Khalkhiin Gol River Basin near Buir Nuur Lake (47°56'984 "N, 118°05'561" E).

Drs. Namhaidorj and Dolgorsuren report seeing have Siberian Cranes in the morning on 22 June 2002 in Khurkha-Gol River Basin near Bayan Burd Lake (48°22'87 "N, 110°32'669" E). At first they noticed four Siberian Cranes, which stayed near a road (within 40-50 m). Four hundred meters from that group, the observers saw seven Siberian Cranes, approximately 300 m away. the same time other cranes flew up in the distance, but it was impossible to determine their species against the sun. In this area, sightings of breeding Eurasian and White-naped Cranes are reported regularly, therefore there is a little likelihood that Siberian Cranes were in the large flock. Ornithologists reported 63 cranes, of which only 11 were definitely Siberian Cranes.

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### **Hong Kong**

On 11 and 12 December 2002, one juvenile Siberian Crane was seen at the Mai Po Marshes Nature Reserve, Hong Kong. This is the first record of this species in Hong Kong. In fact, the first record of any real wild cranes in Hong Kong for more than 35 years ago. The only other substantial record was Eurasian Cranes seen in 1966. This is also the only record of Siberian Crane found south of the Yangtze Valley.

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(Adopted from Hong Kong Bird Report)

## **SIBERIAN CRANE WINTERING IN IRAN**

**By Yuri Markin, George Archibald and Sadegh Sadeghi Zadegan**

Siberian Cranes of the western population, that breeds on the wetlands west of the town of Uvat in western Siberia, spend the winter on the Caspian lowlands of northern Iran. In both the spring and autumn, major resting areas during their 3,500 km migration include the Naurzum Nature Reserve in Kazakhstan and the Astrakhan Nature Reserve in Russia. Both are protected areas. The cranes remain at these staging areas for 1-3 weeks while at other stops they remain only overnight or for a few days. From Astrakhan, the cranes fly along the west side of the Caspian over Dagestan and Azerbaijan. Wetlands in Azerbaijan and near the Ardebil airport in northwest Iran are also brief stopping places.

Two province in Iran border the Caspian Sea; Gilan in the west and Mazandaran in the east. Siberian Cranes were first reported in lowland area of Gilan in the early part of the 20th century. However, during comprehensive mid-winter waterfowl counts conducted by the Iran Department of the Environment since the 1960s, cranes were not sighted in Gilan. In 1978, a small group of 10-12 cranes were discovered near the coastal town of Fereydoon Kenar in Mazandaran Province. They were wintering on three duck and goose trapping complexes called "damgahs" located on flooded rice fields within a stretch of 6 km. In the Persian language (farsi) "damgah" means "the place where birds are caught in a net".

The largest damgah (200 ha) is near the town of Fereydoon Kenar while the other damgahs are smaller and lie to the west near the villages of Esbaran (25 ha) and Sorkhrud (25 ha). The Siberian Cranes move between these damgahs and occasionally to rice fields bordering the damgahs. The cranes usually select ankle deep water where they forage on a variety of aquatic food items including tubers of sedges, small aquatic animals, larvas, insects, seeds and the green vegetation. Typically, they did in the mud for their food.

Map of tree damgahs (Fereydoon-Kenar, Esbaran, Sokhrud) along Caspian Sea coast. Photo by G. Archibald



Trappers take apart the fence encircling the damgah after wintering season. Photo by Yu. Markin



A drop in the water table forces farmers to deepen their rice field by removing top soil into large piles near the fields. The wet rice fields provide habitat in winter for Siberian Cranes. The cranes often dig in the mud for tubers of the weed, *Cyperus rotundus*. By removing these tubers, the cranes are helping the rice farmers. Photo by G. Archibald

Each damgah consists of a large acreage of harvested rice fields flooded artificially to 10-30 cm and bordered by a narrow strip of forests with trees standing about 10 m tall. The inner side of the forest strip is lined by a wall of woven reeds standing about 1.5 m, a wall that must be rebuilt annually before the arrival of the migratory birds. Trappers hide in the forest and behind the wall where they manage their ingenious traps. Thousands of ducks, geese and shorebirds rest on the waters of the damgah during the daylight hours. At dusk and at night they fly to other rice fields to feed, protected from hunters by darkness.

The majority of the waterfowl that gather in the damgahs are dabbling ducks. Common Teal, Mallard, and Pintail are the most abundant while Gadwall, Shoveler, Eurasian Widgeon, Garganey are not uncommon. There are lesser numbers of diving ducks including Common and Red-crested Orchards and Tufted Duck. The geese are predominantly Graylags, although there are fair numbers of Greater White-fronted Red-breasted Geese. Flocks of thousands of Black-tailed Godwits, hundreds of cormorants, many egrets and herons, and a variety of raptors also find sanctuary in the damgahs.

## **The Siberian Cranes**

The three damgahs provide sanctuary for Siberian Cranes. From the discovery of the cranes in 1978 until the later 1990s, the population remained at 9-14 birds and usually included one or two juveniles. Within the large damgah near Fereydoon Kenar, pairs defended large territories against the intrusion of other cranes. It appeared that the damgah could only support three-four pairs. The smaller damgahs did not support territorial pairs suggesting they might not be large enough for such a function. However, these damgahs were often used as feeding and roosting sites non-territorial cranes, which were perhaps unpaired and subadult birds. The small damgahs are also used if the cranes are frightened from the large damgah. Because of the space demands of the cranes, the population failed to increase above 9-14 birds. The other cranes might have been forced to use other wetlands on the Caspian lowlands - wetlands where waterfowl are hunted, not trapped. Perhaps mortality of cranes outside the damgahs is partly responsible for the failure of the population to increase despite excellent productivity. The three damgahs were instrumental in the protection of the remnant population of Siberian Cranes.



Siberian Cranes family flying over fence into damgah.  
Photo by Yu. Markin



Siberian Crane family in 1996. Male was banded with a colour ring and PTT on the wintering site. Photo by Yu. Markin

The territorial behaviour of the Siberian Cranes on the wintering grounds, was instrumental in the discovery of their breeding grounds. Usually the Siberian Cranes remain inside the damgah. However, January of 1996 when two captive-reared male Siberian Cranes were placed in a holding pen near the damgah, the nearby territorial pair tried to attack them. The male of the wild pair was captured in an enclosure built adjacent to the enclosure of the captive birds and satellite radio was saddled on him. That spring his migration was monitored along the west side of the Caspian and then northeast across Kazakhstan and on to vast wetlands west of Uvat, in West Siberia. Through aerial surveys in June of 1996, Russian biologists located a pair of Siberian Cranes. One female and one juvenile were captured and colour-banded, and in subsequent years three more birds were colour-marked on the breeding grounds. The male captured in Iran was re-captured, his satellite radio replaced and his migration route was traced back to Iran. He followed exactly the same route he had used in spring. A total of six cranes were colour marked in the western population.

After the male was captured on the wintering grounds in 1996, the crane family remained inside the damgah. Subsequent efforts to capture wild cranes on the wintering grounds failed because birds could not be induced to leave the damgahs and researchers are unable to work inside the damgahs because to do so frightens the waterfowl away from the trappers.



Siberian Crane family inside damgah. In the background you see aperture for Gezer. Photo by Yu. Markin.

Then the population started to decline. The male marked in 1996, was only seen in Iran again during the winters of 1996-1997. One adult female marked on the breeding grounds in 1996 was seen on the wintering grounds for four years, one year in company with a marked juvenile. The population declined to 9 birds in 1996-1997 and 1997-1998 (2 marked birds), 7 in 1998-1999 (1 marked birds), 5 in 2000-2001 (1 marked bird) and to just 3 during the winter of 2001-2002 and 2002-2003 (no marked birds). Aerial surveys over other wetlands in Mazandaran province in 2000 failed to find Siberian Cranes. Comprehensive ground surveys in both Gilan and Mazandaran provinces in 2000 failed to locate cranes.

## ***Damgahs and Trappers***

Like the Siberian Cranes, damgahs are also endangered. In former times, there were hundreds of damgahs across the Caspian lowlands. Today there are few. Perhaps the introduction of firearms made it easier to harvest waterfowl by shooting than by trapping.

Each trapper "douma-chee" owns or rents a small portion of the forest "douma" in which he establishes his traps, builds a small shelter for himself "koumeh" and an enclosure for the 20-30 domestic but flight-capable mallards to attract wild ducks. The success of the trappers is predicated



A koumeh, or small house where a trapper finds shelter during the night and on rainy days. Photo by G. Archibald

upon their skills with domestic ducks and traps, and the presence of large numbers of waterfowl in the damgah near their traps. It is imperative that the inner core of the damgah be a place where the birds remain undisturbed. Paths and roads leading to the damgahs are blocked and sometimes guarded so that only trappers are allowed to approach the damgah. Hunting with guns is prevented within 1-2 km of the damgahs.

In his "douma" a typical trapper has three methods to catch ducks; the fly-in trap (Doumchal), the swim-in trap (Keres), and the aerial nets (Gezer). Over generations, each method of trapping has been meticulously crafted to coordinate the actions and the tools of the trapper with the behaviour of the wild ducks.

### ***Trapping Method 1. The Fly-in Trap (Doumchal)***



Channel for domestic ducks driving from Doumchal to damgah. Photo by Yu. Markin



Trapper takes duck from Doumchal. Photo by Yu. Markin

Behind the woven wall of reeds, a wedge-shaped area of forest is cleared with the large end of the wedge bordering the woven reed wall that lines the inner side of the forest strip, and the pointed end of the wedge extending almost across the width of the forest strip. One side of the wedge is

covered by dense forest and bushes, while the forest on the other side is bordered by a woven reed wall behind which a canal leads across the forest strip. Most of the area of the wedge is covered by low bushes. However at the end of the wedge is a small triangular-shaped pond bordered on either



Domestic mallards in Doumchal. Photo by Yu. Markin.

side by woven reed walls extended up several meets. The trapper either uses a small boat or a pole to drive a flock of domestic ducks from their holding pen the out along the canal that borders the outer woven reed wall of the wedge. At the end of the canal, the ducks enter a small chamber formed in part by the reed wall that lines the inner side of the damgah. A door is closed to keep the ducks in this chamber. The trapper also enters the chamber and carefully looks out over the top of the woven wall into the core of the damgah. When he sees wild ducks flying near his area, he carefully and skilfully tosses domestic mallards toward them. The domestic duck sometimes joins the wild ducks and leads them back to the small pond at the end of the wedge in the douma. As soon as they land, the trapper pulls a rope which in turn drops a net over the pool. The wild duck is captured and the domestic ducks are rewarded with food.

### ***Trapping Method 2. The Swim-in Trap (Keres)***

A woven reed wall borders a triangular shaped and netted-over pond that extends from the inner wall of the damgah towards the koumeh of the trapper. An opening measuring about 2 m wide and 1.5 m high penetrates the inner wall of the danger. On the inside of this opening is a door that can be elevated by a rope to about 5 meters above the water. The domestic ducks are herded down the same channel used for the Fly-in Trap, but rather than being held in a chamber at the end of the channel, a small opening in the wall of that chamber allows them to escape into the core area of the damgah where they join the wild ducks. Eventually, they seek their home and swim or walk through the opening in the wall. Sometime wild ducks follow them. From the comfort of his koumeh, the trapper observes the happenings and at the right moment pulls a rope that drops the reed-covered door. The wild ducks that swan through the opening are trapped. The wild ducks on the other side of the wall cannot observe the trapper harvesting the captured ducks. Around the door and especially inside of this cage, trapper put some food to decoy wild ducks.

### ***Trapping Method 3. Aerial Nets (Gezer)***

This method is used to catch mainly common teal that fly from the damgah during a 15-20 period at dusk and that return to the damgah at dawn. It's operation is based on the behaviour of the ducks to fly through the lowest, and therefore the easiest, route from the rice fields inside the damgah to areas outside the damgah.

In each douma, the canopy of the forest is cut to create a concave horizon between taller stands at either end. Metal towers with branches of trees tied to their topes to provide camouflage, are placed among the tall trees at either end of this concavity that stretches about 20 meters between the towers. Two or more sets of nets are suspended from ropes between the towers, ropes that pass through pulleys and descend to the trappers who then can elevate or lower the nets.

When a flock of ducks flies from the damgah at dusk or back at dawn, the birds must cross the line of forest that surrounds the damgah. The ducks seek the lowest points on their horizon, which by design of the trappers the lowest part of the concavity between the towers. At just the right second, a rope is pulled and the net is elevated blocking the flight path of the ducks. If the net is pulled too soon the duck see it and fly above it. If is pulled too late, the ducks fly over the concavity before the net is elevated. When ducks are captured in the pockets of one net, that net is lowered, and the ducks removed while another trapper is looking for ducks that are flying in the direction of his second net. Sometimes two nets are extended between the same two towers. Although this method is used primarily to capture teal, is also works for other species of ducks as well as shorebirds, geese, raptors and cormorants.

### ***Low height nets (Sho Doum / night net)***

On the rice fields outside the damgahs, hundreds of low height nets (Sho Doum / night net) elevated on tall poles trap geese, coots and also teals several nights each month when there is total

darkness as a result of cloud cover and/or lack of moonlight. Dozens of domestic graylag geese are driven near the nets during the day. They remain there overnight. Their calls attract the wild geese. Although the use of nets to trap waterfowl is illegal in Iran, the rules have not always been enforced by authorities, especially in this area.



Nets on poles outside the damgah used for catching geese. Photo by G. Archibald



Nets suspended between the metal towers, prepared for the catch at dusk. Photo by G. Archibald

### **Conservation Efforts**

Since the discovery of the Siberian Cranes by researchers from the Iran Department of the Environment, the population has been closely monitored by the DOE and by local people. It became immediately apparent that the conservation of cranes was predicated upon the conservation of the damgahs and the traditional techniques to trap waterfowl. Although the status quo was maintained at the damgahs, the population of cranes decreased during the past ten years.

In 1993, the Convention on Migratory Species (CMS) in Bonn, Germany, developed an Memorandum of Understanding on the Conservation of the Siberian Crane, whereby nations within the range of the species can collaborate in developing and implementing conservation programs. There are two other populations of Siberian Cranes, a central population that migrates to India and a eastern population that migrates to China. All three flyways are included in the MOU. Most of the range states participated in the meetings convened by CMS in Russia (May of 1994), India (November of 1996), Iran (December of 1998) and the USA (May of 2001).

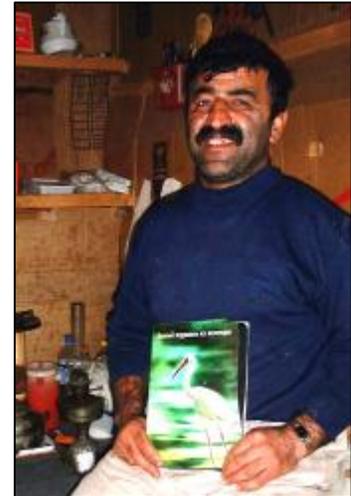
At the 1998 meeting in Ramsar, Iran, many of the participants together with local people from the range of the Siberian Cranes in Iran, formed a non-government organization, the Mazandaran Crane Conservation Association (MCCA). MCCA's members include many of the waterfowl trappers. In 2001, MCCA received a \$50,000 grant from UNEP for conservation efforts with the trappers. These programs continue.

In 2002, GEF/UNEP granted \$1,000,000 for conservation efforts for wetlands used by Siberian Cranes in Iran over the 2003-2009 periods. Concurrently, the International Crane Foundation and CMS hope to provide support to Russian and Iranian colleagues for the restoration of the western population of Siberian Cranes through widespread public education and the bolstering of crane

numbers through the migration of captive-reared cranes with hang gliders from the breeding grounds of the western population of Siberian Cranes in Russia to their wintering grounds in Iran.



Sagedy Zadegan (left) ornithologist with the Iran Department of the Environment, and Hamid Amirebrahimi of the Mazandaran Crane Conservation Association, are respectively among the leaders of the government and private sector interest groups involved in the conservation of Siberian Cranes in Iran.



Gorban Ale Azadi – supervisor of part of Fereydoon Kenar Damgah

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## CONFERENCES

### INTERNATIONAL CRANE WORKSHOP 9–10 AUGUST 2002, BEIJING

*By Vladimir Flint, Tatiana Kashentseva and Elena Ilyashenko*



Opening of the International Crane Workshop. Photo by J. Harris

International Crane Workshop held in Beijing at the turn of the century became an important forum for summarising the results of the studies of cranes and their habitats, as well as evaluation of their status in the wild. At the plenary sessions, the lecturers reviewed long-term studies and considered global changes in the state of crane populations.

Prof. V. E. Flint (Russia) analysed the most extensive environmental changes in Russia over the last decades directly connected with the political and economical situation in the country. The crisis in agriculture, increase in oil production, development of new types of the land use, demographic changes,

extensive poaching, and reduced financial support for research institutes caused changes not only in crane numbers, but also in their ranges, migration routes, and location of pre-migration congregations. He emphasised that the aim of the restored Crane Working Group of Eurasia is to bring together experts for development of the priorities in conservation and study of these birds.



Meeting participants. Photo by J. Harris

Qian Fawen (China) reviewed the population status of nine crane species and problems in their conservation. He pointed out that their numbers are relatively stable in China due to the recent intensification of conservation activities. He evaluated the numbers of the wintering populations of Siberian Cranes (3,000), Red-crowned Cranes (1,200), Hooded Cranes (1,500), and White-naped Cranes (3,500), as well as the breeding populations of the Eurasian Cranes (10,000) and Demoiselle Cranes (5,000). The numbers of Black-necked Cranes reached 7,500 individuals in China, whereas no Sarus Cranes have been recorded over the last 20 years and the species is considered to be extinct in China.

H. Masatomi (Japan) presented the results of 50 years of studies on the non-migratory population of Red-crowned Cranes in Hokkaido. They were begun in the 1950s, when the numbers of the species considerably decreased and there were only 40 birds. The population was saved due to supplemental feeding on the wintering grounds. Despite the losses from collisions with power transmission lines and degradation of wetlands, the number of this species has been steadily increasing and reached 770 individuals in February 2001. However, the shrinkage of suitable habitats resulted in an increase in the nesting density of cranes. Therefore, the most urgent task now is to optimize the breeding territories because of the changing habitat quality and increasing human activity.



T. Kashetseva makes her report about Siberian Crane breeding in the Oka Crane Breeding Center. Photo by J. Harris

Simba Chan (Japan) reviewed the effects of increasing pressure from human economic activity on the cranes inhabiting North-East Asia. The North East Asia Crane Site Network (NEACSN) coordinated by Simba Chan was established in 1997 for training in management of the natural areas, their proper usage, and information exchange.

M. Hake (Sweden) characterised the problem that had arose in many European countries. The number of migrating Eurasian Cranes has considerably increased over the last decades, inflicting greater damage on agricultural fields used as stopover sites by cranes. The results of research conducted in Sweden have shown that the damage could be diminished by the proper management in agriculture, scaring cranes from the most vulnerable fields and attracting them to the protected areas. About 30 reports were delivered at concurrent sessions devoted

to regional studies and conservation, captive breeding and reproductive biology of cranes kept in captivity, ecology of cranes, marking and migration, and the future of crane studies. Russian representatives presented reports about the status and conservation of cranes in Dauria steppes (O. Goroshko, Daurian Nature Reserve), successful captive breeding of the Siberian Cranes (T. Kashentseva, Oka State Biosphere Reserve), results and prospects for introduction of the Siberian Cranes of the West-Siberian population (A. Shilina, All-Russia Research Institute for Nature Protection), the long-term impact of drought and dam construction in the Amur River basin on wetlands and cranes (S. Smirenski, Muraviovka Park for Sustainable Land Use), and crane conservation in Russia (E. Ilyashenko, Crane Working Group of Eurasia).

It was not by chance that Beijing was chosen as the site for the workshop. One of the main aims of the meeting was to support the Crane and Wild Bird Working Group of China to publish the *China*

*Crane News* and to distribute small grants, as well as to promote cooperation between research institutes and nature reserves protecting cranes. The Chinese government has recently been paying particular attention to conservation issues. The State Forestry Administration of China generously covered the expenses of representatives of 10 Chinese nature reserves situated in the Important Bird Areas, so they could participate in the workshop. More than a half of special topic presentations were given by Chinese specialists.

Experts from 12 countries (China, Japan, Republic of Korea, USA, Russia, Mongolia, the Netherlands, Sweden, Senegal, India, Mozambique, and South Africa) discussed an unprecedented case of poisoning of Demoiselle Cranes and other animals with Bromadiolone used for eradication of Brandt's Voles in Mongolia. The workshop adopted a resolution to the Ministry of Nature and Environment, Ministry of Food and Agriculture and Ministry of Health of the Government of Mongolia with a copy to WWF-Mongolia. It was signed by James Harris, ICF President, in the name of Birdlife International, Convention of Conservation of Migratory Species of Wild Animals, IUCN Crane Specialist Group, Ramsar Convention, Crane Site Network (NEACSN), US Program for Environmental Development, Wetlands International, World Health Organization, and Crane Working Group of Eurasia. Participants of the conference recommended banning uncontrolled usage of the chemicals that resulted in mass losses of animals and human deaths. They proposed also to study the experience of the other countries (China, Republic of Korea, and India) in application of less harmful chemicals for the control of rodent pests and to develop long-term plans for land use preventing overgrazing that causes Brandt's Vole population explosions.

The conference was organized by the China Ornithological Society and International Crane Foundation (USA), and supported by the Cracid Breeding and Conservation Centre (Belgium) and Trust for Mutual Understanding (USA). A volume "Abstracts of International Crane Workshop, August 9-10, 2002, Beijing, China" was published prior to the opening of the meeting. Everybody interested can find there the abstracts of the papers by nine members of the Crane Working Group of Eurasia.

A closing ceremony was followed by a concert with Chinese and Mongolian folk dances, national music, and songs.



Chinese dance. Photo by C. Miranda

Excellent organization of the workshop should be particularly commended. It was held in the "Wofosi" Hotel located in the Botanical Garden close to Beijing. The Garden is located in a very picturesque area of the former "Sleeping Buddha" Monastery protected by the government. Most of the park, including a pagoda with the statue of Sleeping Buddha, is open daily to visitors. A mountain section with pagodas and other monastery buildings is closed to the public.



Office of Xianghai Nature Reserve. Photo by J. Harris

On 11 August, a group of workshop participants visited the Beijing Zoo, which was founded by the Guang Ksu Emperor in 1906. It was formerly called "Park of Ten Thousand Animals" and became "Beijing Zoo" only in 1955. At present, five thousand mammals, birds, reptiles, and amphibians of more than 450 species and over 10 thousand fishes and water invertebrates of 500 species constitute the collection of the Zoo. The Giant Panda is the flagship species of the Zoo; 13 pandas live there. A breeding pair of Oriental Crested Ibis is the pride of the Ornithological Department. The ibis are the oldest birds in the Zoo at 20 years of age. About 200 cranes of nine species (Siberian, Red-crowned, Eurasian, White-naped, Hooded, Black-necked, Demoiselle, Sandhill, and Crowned Cranes) are kept in the Zoo.

After the workshop was over, several participants in the GEF Siberian Crane Wetland Project had the opportunity to visit the Xianghai Nature Reserve in Jilin Province (northeast China). The reserve

is one of the 16 sites managed under the project and is located on the migration route of the eastern population Siberian Cranes. In addition, White-naped and Red-crowned Cranes nest in the reserve. Hooded, Eurasian, and Demoiselle Cranes stop in the reserve during migration.



The landscape of the Reserve is represented by the plain steppe with Mongolian elm groves. Photo by J. Harris

The Xianghai Nature Reserve was established in 1986 for preservation of an important natural community in north-eastern China, represented by wetlands used as breeding sites by the White-naped and Red-crowned Cranes and other waterbirds. The reserve covers 105,000 hectares and is inhabited by 20 thousand people. The landscape of the Reserve also includes grass steppe, elm groves with trees 3-4 m tall, and lakes of various sizes. Undisturbed areas alternate with cultivated fields and pastures. Specially protected areas allotted for restoration of grass cover are enclosed in short fences to make them inaccessible to goats, which inflict considerable damage to native vegetation. Areas outside such enclosures are virtually lacking

vegetation. Water is delivered to the Reserve by three rivers; their water levels depend upon precipitation and are artificially maintained by dams and other water control structures.

In the Breeding Centre, 39 Red-crowned Cranes, a Siberian Crane, a Eurasian Crane, a few White-naped and a few Demoiselle Cranes are kept. Every enclosure houses 5 to 10 adult birds. In spring the pairs are released onto the wetlands of the Reserve, where they build their nests, lay eggs, and incubate clutches. The chicks are taken to the Centre immediately after hatching and raised by hand; their parents are returned to the pens. Afterwards the young birds are transferred to zoos.

A Siberian Crane kept in the Centre was caught as a young bird with brown feathers in May 2002. Local people often illegally capture migrating cranes and keep them in their private farms. If such birds are found, they are taken to the Centre and then released during the migration season so that they can rejoin wild birds. This year, three Siberian Cranes were released in this manner in March and departed north together with the migrating flock. In spring 2001, 168 Siberian Cranes were recorded during migration and about 30 in autumn 2002. In 1997, a Siberian Crane with a blue leg band was observed in the reserve.

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## **Meeting On Siberian Crane Flyway Coordination 11 August, 2002, Beijing, China**

**By Elena Ilyashenko and Claire Mirande**

The goals for international cooperation on conservation of the Siberian Crane and its habitats cover three flyways: 1) Eastern Flyway - breeding in Yakutia, Russia and wintering in Poyang Lake, China, 2) Western Flyway - breeding in Upper Ob Basin of Russia and wintering on the south Caspian Sea in Iran, and 3) Central Flyway - breeding in Lower Ob Basin of Russia and wintering in northwest India. In 1993, a **Memorandum of Understanding concerning Conservation Measures for the Siberian Crane** was developed under the auspices of the Convention on Migratory Species of Wild Animals (CMS). In 1998 it was amended. It now has nine signatory

states: Azerbaijan, China, India, Islamic Republic of Iran, Kazakhstan, Pakistan, Russian Federation, Turkmenistan, and Uzbekistan. It is hoped that the two remaining states – Afghanistan and Mongolia – will become members in the near future.



Claire Mirande represents the Conservation Plan. Photo by J. Harris

Every two years Siberian Crane Range States meet to revise Conservation Plans for Western, Central, and Eastern and Populations and to report on work carried out. At the Fourth Meeting on Siberian Crane Range States hosted by International Crane Foundation (ICF) in 2001, efforts to improve international cooperation within and between flyways were expanded and strengthened. The position of Siberian Crane Flyway Coordinator (SCFC) was established jointly under CMS and ICF. Elena Ilyashenko was appointed to fill this international

role. Moscow was approved as an appropriate site for the Siberian Crane Flyway Coordination Centre.

All Siberian Cranes breed in Russia and large parts of the flyways occur within this country. Elena also serves as the Executive Director of the Crane Working Group of Eurasia which includes five of 10 Siberian Crane Range States. Additional information can be found in the CMS publication "Conservation Measures for the Siberian Crane, Second Edition", 2002, and on the CMS web-site: [www.wcmc.org.uk/cms](http://www.wcmc.org.uk/cms).

A United Nations Environment Program (UNEP) / Global Environment Facility (GEF) Full Project on the **Development of a Wetland Site and Flyway Network for Conservation of the Siberian Crane and Other Migratory Waterbirds in Asia** was approved and is due to start in April. Guidelines for species level flyway coordination were developed under the GEF PDF B phase from 2000-2002. These guidelines will be implemented under the GEF Full Project. It was agreed that Elena Ilyashenko would jointly serve as SCFC under both the GEF project and the CMS MoU. Under the Asia-Pacific Migratory Waterbird Conservation Strategy a North East Asia Crane Site Network (NEACSN) was established in 1997 with Simba Chan of the Wild Bird Society of Japan serving as Flyway Officer.

To clarify the respective roles and relationships between the GEF/CMS Siberian Crane Flyway Coordinator and the NEACSN Flyway Officer, a Siberian Crane Flyway Coordination meeting was held in Beijing, just after International Crane Workshop in August 2002. Participants included ICF, NEACSN, Wetlands International (WI), Cracid Breeding and Conservation Centre, and representatives of Russia, China, India, Mongolia and Japan.

It was agreed that as SCFC, Elena would have the overall responsibility for co-ordinating flyway level activities on a global level and for co-ordinating GEF activities with other flyway conservation initiatives. Elena will co-ordinate flyway level activities of the project in Western and Central Asia. Simba Chan, the Flyway Officer for the NEACSN, will co-ordinate activities in North-East Asia. In order to ensure good co-ordination between the project and the NEACSN, a subgroup of the Crane Working Group will be established on the Siberian Crane. Meetings of the respective flyway groups will be attended by both Elena Ilyashenko and Simba Chan, thus ensuring good overall co-ordination.

The wider framework for migratory waterbird conservation across the range of the Siberian Crane includes the Asia Pacific Migratory Waterbird Conservation Action Plan (APMWCP), Africa-Eurasia Waterbird Agreement (AEWA), GEF project (in PDF B phase now), Central Asia Flyway project (Wetlands International project with the Netherlands Government support), as well as the Arctic and national level projects.

The GEF project will contribute significantly to the development of crane site networks through a wide range of activities at regional, national and site levels. These sites include the main breeding, wintering, and migration areas for the eastern and western populations of the Siberian Crane.

The GEF project and the NEACSN will co-operate on shared priority activities including training and other capacity building, education and public awareness (i.e., Crane Day Celebrations and information exchange, amongst other subjects).

Exchange of staff between sites, twinning of sites and other links will be established to strengthen the regional site networks. This will include the development of a site network in Western / Central Asia based on the experience of the NEACSN and within the larger framework of CMS and the APMWCP.

Collecting and sharing information about autumn and spring migration of the Siberian Crane was identified as a key task. This will be accomplished through immediate sharing of reports by e-mail, prompt updating of the Siberian Crane Flyway Co-ordination web-site, and distribution of electronic issues of Siberian Crane Flyway Newsletters twice each year.

Participants discussed needs for a Siberian Crane flyway-level database. Representatives of WI, NEACSN, and the China Ornithological Society reported on the experiences of their organization with database creation, primarily using Microsoft Access. Items proposed for inclusion in the Siberian Crane database were: information on ecology of the Siberian Crane; historic records; current sighting reports; updates on status and threats at sites along migration routes; population estimates; maps of breeding, migrating and wintering sites; management; stakeholders; and information on other rare species. A section of the database will be devoted to research and banding programs under the international project "The Siberian Crane," which includes captive breeding and release to the wild. Database should be designed to facilitate data sharing with other research programs and projects such as the International Waterbird Census or the International Wetlands Inventory managed by WI.

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## **PUBLICATIONS**

**UNEP/CMS. ed. Conservation Measures for the Siberian Crane, Second Edition. CMS Technical Series Publication No.7, UNEP/CMS Secretariat, Bonn, Germany. 2002.**

The publication consists of five sections containing: the text of Memorandum of Understanding and the Conservation Plans for the Western, Central and Eastern Siberian Crane populations; a listing of activities to be carried out in each Range State; a summary report of the Fourth Meeting of the Range States; copies of the reports submitted to the meeting by each delegation; and additional reference materials.

The Conservation Plans for the Western, Central and Eastern Siberian Crane Populations approved in May 2001 are presented separately in tabular form. Each is structured according to three or four basic objectives, followed by a number of programmes and specific activities, which recognize both the similarities and differences in the actions required to restore the three populations. At their core, all three plans aim to: (1) reduce mortality in the remaining populations; (2) protect and manage habitats; and (3) enhance co-operation among the Range States and other concerned agencies. The plans for the Western and Central Populations strive also to increase numbers and genetic diversity.

The entire publication can be found on CMS website: [www.wcmc.org.uk/cms](http://www.wcmc.org.uk/cms)

**Claire Mirande. Siberian Passage: Flight of Hope. The ICF Bugle. November, 2002. V. 28, #4.**

Very interesting information about Siberian Crane hang-glider experiment in Western Siberia that can be found on ICF website <http://www.savingcranes.org>

**Germogenov N.I. Current Status of Crane Research and Conservation in Yakutia. - Crane of Eurasia (distribution, number, biology). Moscow. 2002. P. 106-115.**

The Siberian Crane population status in Yakutia for the last 40 years is analysed. Literature data is compared with survey results for the last five years. The current Siberian Crane population status is relatively safe. The results of aerial and ground surveys estimate the current number of Siberian Cranes on its eastern breeding areas at 1,620-2,030 birds. The high density of cranes did not change in response to weather conditions in different years. The data suggest that the previously used method of aerial counts underestimated the actual number of birds. On the other hand it assumes that alternative Siberian Cranes breeding grounds exist. The "Kytalyk" and "Chaigurgino" Resource Reserves play major roles in conservation of Siberian Crane breeding and summer habitats. These reserves cover almost all the three highest density breeding areas of this population (i.e., "Khromsky", "Indigirsky", and "Alazeisky"). The reserves are also the breeding sites of the main part of the Sandhill Crane population in Yakutia. Lead shots on the bottom of lakes, especially along the Kolyma River, presents a threat to the eastern Siberian Crane population.

To obtain a copy contact Elena Ilyashenko at [elyashenko@wwf.ru](mailto:elyashenko@wwf.ru) or Betsy Didrickson at [library@savingcranes.org](mailto:library@savingcranes.org)

**Germogenov, N.I., A.E. Psennikov, Yu. Kanai, N.I. Egorov, S.M. Sleptsov. On the Siberian Crane Ecology in Yakutia. Crane of Eurasia (distribution, number, biology). Moscow. 2002. P. 115-129.**

Data is presented on Siberian Crane habitats, spatial-temporal and social structure, population reproduction and diurnal activity rhythms obtained as the result of aerial (1993–1996) and ground (1995–1996) surveys of the Yelon Specially Protected Area in the Kytalyk Resource Reserve in Yakutia. Ninety-nine Siberian Cranes were observed on the 1,982 sq. km territory. (2.4% of the current breeding area of this species in Yakutia). This constitutes 3.5% of the whole Yakutia population, wintering in south-eastern China (about 2,800 birds). The density of the crane population on controlled sites located in habitats with optimal conditions ranges from 7.34 - 7.79 birds/100 km<sup>2</sup>.

A method for Siberian Crane field research using a system of observation points with overlapping view is described and was applied in the tundra for the first time. The method showed its high resolution capacity in bird censuses. In particular, the new technique has allowed to locate 40 breeding territories that are used by Siberian Cranes repeatedly, from year to year, against only 24 spotted during the aerial survey of the area. The same 40 sites were clearly identified as Siberian Crane territorial sites by earlier ground surveys." Data on the Siberian Crane movements obtained through satellite telemetry of nine birds caught during the moulting period and marked with satellite transmitters is provided. On the basis of this data the size and structure of breeding territories, the characteristics of daily movements and some aspects of habitat usage during breeding period are determined. Results indicate that the Siberian Crane pairs are attached to their territories throughout the entire breeding season.

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**Wetlands International. Waterbird Population Estimates – Third Edition. Wetlands International Global Series No. 12, Wageningen, The Netherlands. 2002.**

Information on the breeding and non-breeding ranges, Ramsar sites, number estimation and trend are presented for waterbirds including 15 crane species.

The first edition of Waterfowl Population Estimates (Rise and Scott, 1994) provided a first global overview of the status of the world's waterbird populations. It was prepared with four objectives, and these objectives have not changed in subsequent editions:

- to assist in the identification of wetlands of international importance using waterbirds as bio-indicators, and especially to provide the basis of the so-called 1% criterion
- to identify priorities for conservation and research to maintain global waterbird biodiversity
- to identify gaps in knowledge of the world's waterbird populations
- to support the development of the Ramsar, Bonn and Biodiversity Conventions.

The second edition of *Waterfowl Population Estimates* (Rise and Scott, 1997) included many more population estimates and much more information on population trends.

This third edition (now renamed *Waterbird Population Estimates*) provides more information in the tables and includes distribution maps for all species, English vernacular names for all species and some distinctive subspecies, and short descriptions of both the breeding and non-breeding ranges of all populations.

The International Waterbird Census (IWC), coordinated by Wetlands International, now covers over 100 countries in five continents, and continues to provide much of the raw data on which many of the estimates and trends are based. Additional census schemes and atlas projects have contributed a wealth of new information on population sizes in many parts of the world.

To obtain a copy, contact Wetlands International office in your country or go to the Wetlands International website [www.wetlands.org](http://www.wetlands.org)