

Western flyway of the Siberian Crane *Grus leucogeranus*: further releases of captive-reared birds in Iran

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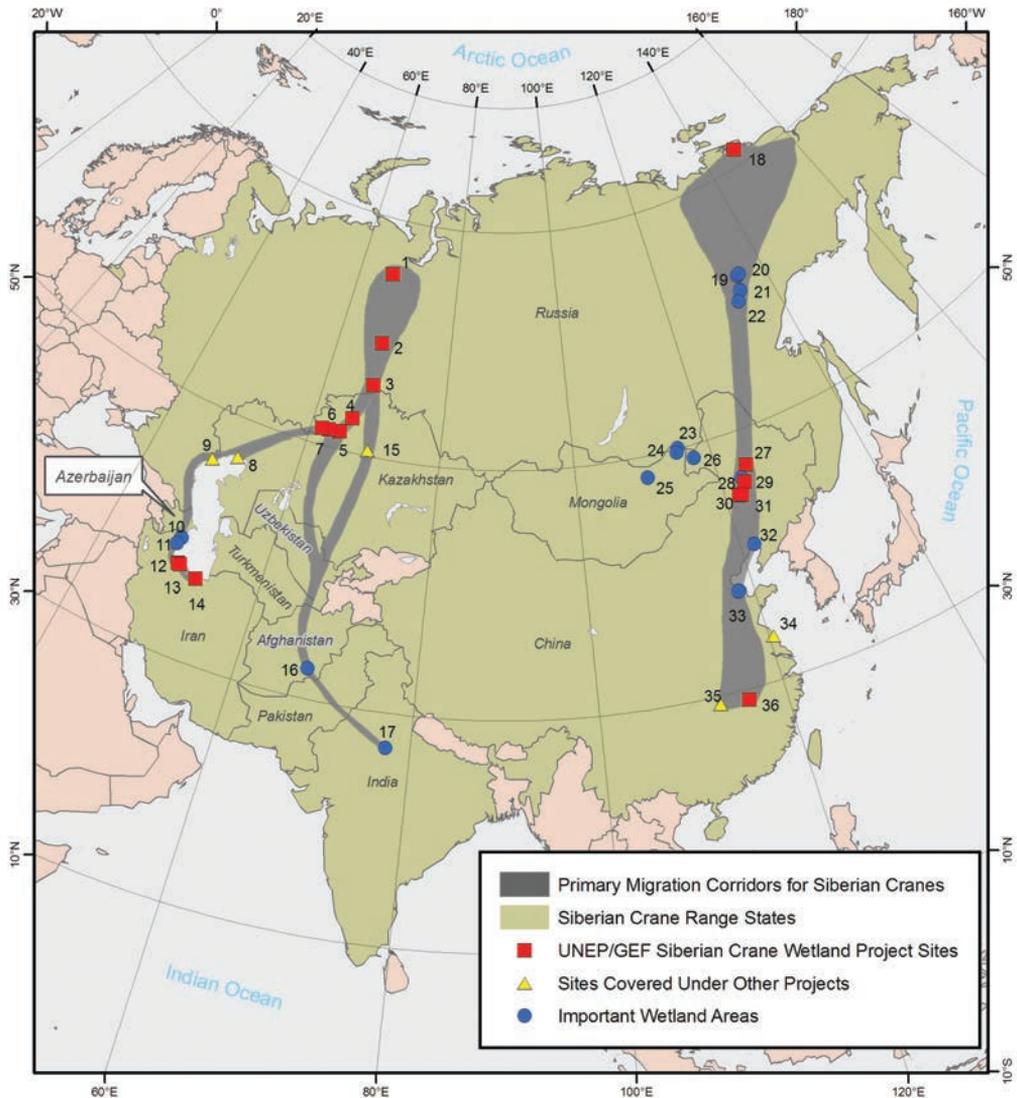
The Siberian Crane *Grus leucogeranus* is the world's third rarest crane after the Whooping *G. americana* and Red-crowned Cranes *G. japonensis*. It is listed in the IUCN Red List of Threatened Species (www.iucnredlist.org) as a critically endangered species. The Siberian Crane total population was believed to number only a few hundred until 1981, when a wintering flock of 830–850 was discovered at Poyang lake along the middle Yangtze river in China. Subsequent field surveys have revised the total population estimate to c3500 birds.

The species (CMS/ICF 2008) is divided into two populations, the Eastern and Western/Central Asian, which used three migration routes (Figure 1). Genetically, there is no significant difference between the populations despite their geographical isolation (Ponomarev *et al* 2004). There are two flocks or groups of birds within the W/C Asian population, one of which migrated to India and the other to Iran. Now there are so few birds left, that it is difficult to say how they represent past population(s), even though we know they had different wintering grounds and migration routes. Currently, more than 99% of the world's total population of Siberian Cranes belongs to the Eastern population. These birds breed in north-eastern Siberia and winter along the middle Yangtze river in China. The Central Asian flock of Siberian Cranes recently nested on the riparian lowlands of the Kunovat river in western Siberia. It traditionally migrated 5000 km southeast over the now Russian Federation, Kazakhstan, Uzbekistan, Turkmenistan, Afghanistan, and Pakistan, before arriving at the wintering grounds in Keoladeo national park in Rajasthan, India. The last known pair wintered there in 2001/2002 and currently there are no individuals that are known to winter in India.

Based on successful satellite tracking of one wild Siberian Crane (Sorokin & Markin 1996) and subsequent observations at the same site, the Western Asian flock is thought to breed in the centre of west Siberia, in the Russian Federation. The Western migration route reaches wintering grounds on the Caspian lowlands of northern Iran (Figure 1), but the wintering flock has steadily declined to just one known wild bird at the present time. The most important stopover sites are the Naurzum nature reserve (Kazakhstan) and Astrakhan nature reserve (Volga river delta, Russian Federation). The cranes remain at these staging areas for 1–3 weeks while at other stopovers they remain only overnight or for a few days. From Astrakhan, the cranes fly along the west side of the Caspian sea over Dagestan (Agrakhan federal wildlife refuge in the Terek river estuary, Russian Federation) and Azerbaijan (cape Sharabad, Shirvan steppe national park, with a short stopover in Kurinskaya Kosa in the Kyzyl-Aghach nature reserve). The migration route continues towards the east along the south side of the Caspian sea to flooded rice fields used for duck trapping (damgahs) near Fereydoon Kenar, Iran. The Siberian Cranes usually arrive on these wintering grounds in late October or early November and remain until late February or early March (CMS/ICF 2008).

CONSERVATION EFFORTS

The history of Siberian Crane conservation started in 1973 with cooperation between Dr Vladimir Flint and Drs George Archibald and Ronald Sauey, co-founders of the



Map by the International Crane Foundation 2005
Cartographer: Zoë Rickenbach

Figure 1. Map of Siberian Crane's *Grus leucogeranus* three flyways. Key for the two western flyways: 1 Kunovat river basin (breeding site), 2 Konda & Alymka river basins (breeding), 3 Tyumen & Kurgan transboundary wetlands (migration), 4 Tontegir hollow & Zhanshura lake (migration), 5 Naurzum nature reserve (migration), 6 Urkash & Zharsor lakes (migration), 7 Kulykol lake (migration), 8 Ural river delta (potential migration stopover), 9 Volga river delta (migration), 10 Shirvan national park (migration), 11 Kyzyl-Aghach nature reserve (migration), 12 Bujagh/ Sefid Rud delta (potential wintering site), 13 Amirkelayekh & Rud Posht (potential wintering site), 14 Fereydoon Kenar (wintering), 15 Tengiz lake (migration), 16 Ab-i-Estada (migration), 17 Keoladeo national park (wintering).

International Crane Foundation. They also pioneered conservation work with the Siberian Crane through collaboration with Iran, Afghanistan, India and China. This conservation work was expanded to all Siberian Crane range states which signed a "Memorandum of Understanding Concerning Conservation Measures for the Siberian Crane" in 1993. Besides the 11 range states, several conservation organizations such as the International Crane Foundation (ICF), the Wild Bird Society of Japan, Wetlands International and the

Cracid & Crane Breeding and Conservation Centre (CBCC) have signed this agreement (Archibald *et al* 2007). From this base, ICF, with the governments of the Russian Federation, Iran, Kazakhstan and China, launched a joint initiative adopting the Siberian Crane as a flagship species to develop and maintain networks of globally important wetlands along its flyways in West/Central and East Asia. The Siberian Crane Wetlands Project (SCWP, www.scwp.info) started in 2003, funded by the Global Environment Facility (GEF) and implemented through the United Nations Environment Programme (UNEP). In W/C Asia, it aims to secure the effective management of the critical sites used by Siberian Cranes in Iran, Kazakhstan and Russia as an essential basis for the continuation of the reintroduction project (Moermond *et al* 2008).

WINTERING POPULATION AND ITS HABITAT IN NORTHERN IRAN

Two provinces in Iran border the Caspian sea, Gilan in the west and Mazandaran in the east. Siberian Cranes were first reported in lowland areas of Gilan in the early part of the 20th century. However, they have not been seen there during the comprehensive mid-winter waterfowl counts done by the Iranian Department of the Environment, conducted since the 1960's. In 1978, a small group of 10–12 cranes was discovered near the coastal town of Fereydoon Kenar in Mazandaran province. They were wintering at three duck and goose trapping complexes, damgahs (Farsi: “the place where birds are caught in a net”). The largest damgah (200 ha) is close to Fereydoon Kenar while the others are smaller and lie further west near the villages of Esbaran (25 ha) and Sorkh Rud (25 ha). The Siberian Cranes move between these damgahs and occasionally to rice fields bordering them. The cranes usually select ankle-deep water where they forage on a variety of aquatic food items including sedge tubers, small aquatic animals, seeds and green vegetation. Typically, they dig in the mud for their food (Meine & Archibald 1996, Markin *et al* 2002).

Each damgah consists of a large area of harvested rice fields flooded artificially to a depth of 10–30 cm and bordered by a narrow strip of forest with trees standing c10 m tall. The inner side of the forest strip is lined by a wall of woven reeds standing c1.5 m high, a wall that must be rebuilt annually before the arrival of the migratory birds. Trappers hide in the forest and behind the wall from where they operate their traps. Thousands of ducks, geese and shorebirds rest in the damgah during 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 *Anas crecca*, Mallard *Anas platyrhynchos* and Northern Pintail *Anas acuta* are the most abundant while Gadwall *Anas strepera*, Northern Shoveler *Anas clypeata*, Eurasian Wigeon *Anas penelope* and Garganey *Anas querquedula* are not uncommon. There are lesser numbers of diving ducks including Common *Aythya ferina* and Red-crested Pochards *Netta rufina* and Tufted Duck *Aythya fuligula*. The geese are predominantly Greylags *Anser anser*, although there are fair numbers of Greater White-fronted *Anser albifrons* and occasional Lesser White-fronted *Anser erythropus* and Red-breasted Geese *Branta ruficollis*. Flocks of thousands of Black-tailed Godwits *Limosa limosa*, hundreds of Great Cormorants *Phalacrocorax carbo*, many egrets and herons, and a variety of raptors also find sanctuary in the damgahs. The International Waterbird Census (www.wetlands.org) provides a strong dataset, over eight years, on the occurrence of various species at the Fereydoon Kenar non shooting area.

The Siberian Crane population at the Fereydoon Kenar wintering site numbered between 9 and 14 birds until the late 1990's, and usually included one or two juveniles. Within the largest damgah, pairs defended large territories against the intrusion of other Siberian Cranes. It appeared that the damgah could support only three to 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 by non-territorial Siberian Cranes, which were perhaps unpaired and sub-adult birds. The smaller damgahs are also used if the cranes are disturbed at the large damgah (CMS/ICF 2008).

Due to various factors such as the space demands of the cranes, natural mortality, illegal hunting and habitat destruction, the population not only failed to increase above 9–14 birds, but then started to fall. The population was 9 birds in 1996/97 and 1997/98, 7 in 1998/99, 5 in 2000/01, 3 (adults) in 2001/02 and 2002/03 and 3 adults and one juvenile in 2003/04. In 2004/05 three adults (a pair and a single bird) spent the winter at Fereydoon Kenar, but only two single cranes arrived in autumn 2005. In autumn 2006, again two single Siberian Cranes arrived on the wintering grounds, but one disappeared in January 2007 (CMS/ICF 2008). In winters 2007/08 and 2008/2009 only a single wild Siberian Crane arrived and wintered.

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 and 2003 (Markin & Sadeghi Zadehan 2003c) also failed to locate cranes at other sites, and the annual midwinter waterbird counts across the south Caspian lowlands have not found any. However, the existence of additional birds is confirmed by the sighting of 4 Siberian Cranes in Astrakhan nature reserve almost one month after the arrival of two Siberian Cranes on the wintering grounds in Iran in 2006 (Rusanov 2007). In addition, there have been some unconfirmed Siberian Crane sightings at breeding sites in West Siberia (Markin *et al* 2007) and regular observations of 2–7 Siberian Cranes during migration stopovers in Naurzum nature reserve in Kazakhstan (Bragin 2003, 2005, 2007). All these sightings suggest the existence of additional wintering sites.

SIBERIAN CRANES IN CAPTIVITY

The Siberian Crane is held in captivity at various institutions. ICF (USA), Oka Crane Breeding Centre (OCBC, Plate 1, Russian Federation) and CBCC (Belgium) have the biggest captive flocks. The 4th issue of the International Siberian Crane Studbook was prepared in 2006 and includes information on 326 captive Siberian Cranes (129 males, 127 females and 70 others) held by 40 agencies in 10 countries (Kashentseva & Belterman 2007). A total of 104 captive-bred Siberian Cranes from the OCBC have been released into the wild between 1992 and 2008, as follows (Tatiana Kashentseva pers comm 2008, updated by SSZ): 30 in the north of west Siberia in Kunovat wildlife refuge (Russia), 53 in the south of Tyumen region in Belozerskiy wildlife refuge (Russia), 9 in Volga river delta in Astrakhan nature reserve (Russia), 8 in Fereydoon Kenar (Iran) and 4 in Keoladeo national park (India).



Plate 1. Parent-reared Siberian Crane *Grus leucogeranus* chick, Oka Crane Breeding Centre, Russian Federation. © T. Kashentseva

RELEASE HISTORY OF CAPTIVE-BRED SIBERIAN CRANES IN IRAN

Detailed information on the Siberian Crane releases at the wintering grounds in Fereydoon Kenar is presented below.

Winter 1996/97. Two adult males, 'Yertle' and 'Arjan', that were parent-reared in captivity at ICF, USA, were imported into Iran in late winter. These birds and a wild male captured at the release site were ringed with colour bands and had PTTs (donated by Wild Bird Society of Japan) attached and were released at a trapping unit in Fereydoon Kenar. The captive-reared cranes did not join the wild cranes and did not migrate. One of them was recaptured and held at Pardisan eco-park, Tehran, and died in captivity in 2006. However, the wild crane carrying the PTT migrated west across the Caspian lowlands, across Azerbaijan, Chechnya, and then to the Volga delta where it remained for 17 days before continuing northwest to a presumed breeding area just east of the Ural Mountains and northwest of Tyumen city in Uvat region (Sorokin & Markin 1996).

Winter 2002/03. In January 2003, three young Siberian Cranes raised at the OCBC were sent to the wintering grounds near Fereydoon Kenar. Two of the birds, 'Khoher' and 'Don', both males, reared using an isolation technique, had participated in a hang-glider experiment in 2002, making the long flight from the breeding grounds near Kunovat to Armizon (SW Siberia). The third crane, a female named Angara, was parent-reared. On 13 January 2003, Angara was ringed with a yellow plastic band with black number 77 and had a satellite transmitter (PTT number 15417) attached. She was released into a second, recently-built, damgah at Sorkh Rud, the wintering site of a male wild Siberian Crane and a young Eurasian Crane *Grus grus*. On 16 January, Don and Khoher were released into Fereydoon Kenar damgah, where there was a wild pair of Siberian Cranes. But on 3 March, for various reasons, Don and Khoher were returned to captivity (to Bujagh national park, Iran, a potential wintering site), where they later died. On 2 March, Angara, the wild pair of Siberian Cranes and the young Eurasian Crane left the area, presumably commencing migration (Markin & Sadeghi Zadegan 2003a). PTT data showed Angara's route from Fereydoon Kenar, through Azerbaijan to Dagestan (Russia). After 4 March, in Dagestan, the receiving of PTT data stopped, but on 28 April (after nearly two months) it recommenced from almost the same location. PTT data continued to come throughout May until 10 June 2003 (Ilyashenko 2003). Observation of the area in Dagestan where the last stationary PTT data were received was conducted, but neither the bird nor the PTT were found (Dzhamirzoyev & Bukreev 2003).

Winter 2003/04. Two young Siberian Cranes, 'Vokhma', a male, and 'Suna', a female, parent-reared at OCBC, were released at Fereydoon Kenar damgah, on 26 and 27 December 2003 respectively. Vokhma was ringed with a standard metal ring (A145985) on the right leg and a blue-white-yellow



Plate 2. Suna just after release at Fereydoon Kenar damgah, 7 November 2005. © S Sadeghi Zadegan



Plate 3. Arrival of Inya and Vitim at Fereydoon Kenar, 26 January 2007. © S Sadeghi Zadeگان



Plate 4. Inya and Vitim in captivity at Fereydoon Kenar damgah the day before Inya's release, 28 January 2007. © S Sadeghi Zadeگان



Plate 5. Inya and Vitim in captivity at Fereydoon Kenar damgah the day before Inya's release, 28 January 2007. © S Sadeghi Zadeگان



Plate 6. Vitim in captivity at Fereydoon Kenar damgah, summer 2007. © S Sadeghi Zadeگان

plastic band on the left leg. Suna was ringed with a green plastic band (white number 03 and attached PTT #33244) on the right leg and a standard metal ring (A185986) on the left leg. On 3 March 2004, they commenced migration. However, Suna was caught by local people c300 km away near Anzali wetland in Gilan province, and taken into captivity at Bujagh national park until autumn 2005 (Markin & Sadeghi Zadeگان 2003b). The plastic band and PTT were removed from her.

Winter 2005/06. On 7 November 2005, two days after the arrival of two wild Siberian Cranes, Suna was released again at Fereydoon Kenar damgah (Plate 2). She was ringed with one orange plastic band/leg in addition to the metal ring on the left leg. Each plastic band has two letters, XP (right leg) and HN (left). Almost immediately after release, Suna joined one of the two lone wild cranes. She fed on natural food items in flooded rice fields, and was in the constant company of the wild crane (Sadeghi Zadeگان & Archibald 2005). She left on migration along with the two wild Siberian Cranes on 3 March 2006 but has not been seen since (Sadeghi Zadeگان 2007).

Winter 2006/07. On 26 January 2007, two parent-reared Siberian Cranes, 'Inya' and 'Vitim' were transferred to Tehran from OCBC. The birds were then driven to Fereydoon Kenar and placed in a pen built at the damgah (Plates 3–5). On 29 January, Inya was released at the damgah to accompany a wild male Siberian Crane. She had a yellow plastic band (55) on the left leg and a standard metal ring (A145910) on the right, and an attached PTT (33244). After release, Inya joined the wild male. After 3 days they made unison calls. They



Plate 7. Vitim with colour rings in captivity at Fereydoon Kenar damgah, October 2007. © S Sadeghi Zadegan



Plate 8. Vitim after his first release at Fereydoon Kenar damgah, 14 November 2007. © S Sadeghi Zadegan



Plate 9. Vitim, Fereydoon Kenar damgah, 5 February 2008. © S Sadeghi Zadegan



Plate 10. Vitim and wild Siberian Crane, Fereydoon Kenar damgah, 5 February 2008. © S Sadeghi Zadegan



Plate 11. Vitim and wild Siberian Crane, Fereydoon Kenar damgah, 5 February 2008. © S Sadeghi Zadegan



Plate 12. Vitim and wild Siberian Crane, Fereydoon Kenar damgah, 5 February 2008. © S Sadeghi Zadegan



Plate 13. Neya in pen at Fereydoon Kenar damgah, 10 December 2008. © S Sadeghi Zadegan



Plate 14. Neya and wild Siberian Crane, Fereydoon Kenar damgah, 22 January 2009. © S Sadeghi Zadegan

kept together and started migration on 28 February. Unfortunately, no satellite transmitter data was received after her departure.

Vitim, wearing a standard metal ring (A145911), was kept in captivity at Fereydoon Kenar damgah during spring and summer 2007 (Plate 6). Later, he was also given two plastic colour bands (green and red, Plate 7, Markin & Sadeghi Zadegan 2007).

Winter 2007/08. On the night of 3 November 2007, a wild male Siberian Crane arrived at Ezbaran damgah. On 14 November, at 07.15 h, Vitim was released at Fereydoon Kenar damgah (Plate 8). Thirty minutes later the wild male landed close to Vitim. Vitim flew out of the damgah on 27 November but at 23.30 h was captured in a net set up by trappers for geese in Sooteh village. Vitim was returned to Fereydoon Kenar damgah and placed in the pen. On 17 December, he was released again at Fereydoon Kenar damgah. Vitim and the wild Siberian Crane were seen flying together on 22 December. They were photographed on 5 February 2008 (Plates 9–12). These two Siberian Cranes began their northern spring



Plate 15. Neya and wild Siberian Crane, Fereydoon Kenar damgah, 22 January 2009. © S Sadeghi Zadegan

migration on 23 February (they were not observed in the area by local people after that date).

LATEST RELEASE

Winter 2008/2009. On 26 October 2008, a single unringed wild Siberian Crane arrived at Fereydoon Kenar. On 9 December, a captive-bred Siberian Crane (female 'Neya') was transferred to Iran from OCBC. This bird had hatched there in 2005 and was reared by her parents. On 10 December 2008, Neya was transferred to Fereydoon Kenar and placed in a pen, where a white plastic band (black number 185) was placed on the right leg and a standard metal ring (A16090) on the left leg (Plate 13). On 13 December, Neya was released into Fereydoon Kenar damgah. Before release, a PTT (82129) was attached to Neya's back. After release, she joined the wild male crane, but didn't fly with him to the roosting site, staying in the damgah instead. From 20 December, Neya was present at a farm close to Sooteh village, where she was observed feeding on small fish. Neya joined the wild Siberian Crane on 5 January 2009 (Plates 14 & 15) and they started migration together on 25 February. As usual, the cranes flew high above the damgah before their departure. The final PTT signals were received from the Sefid Rud river area, Gilan province, c250 km northwest of Fereydoon Kenar, on 1 March 2009.

In summary, a total of ten captive-bred Siberian Cranes have been released at Fereydoon Kenar in Iran since the winter of 1996/1997; three of them died and five started migration along with wild cranes. All cranes were ringed with colour plastic bands and three of them were also fitted with satellite transmitters. Unfortunately, all the transmitters stopped working after a short time or just after migration started. None of the released Siberian Cranes returned to the wintering grounds. These results indicate that further discussion and review are needed to improve release techniques and more effective use of PTTs is required to track released birds.

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